

**BEFORE THE GUJARAT ELECTRICITY REGULATORY COMMISSION  
AHMEDABAD  
I.A. NO. 8 OF 2016  
IN  
CASE NO. 1024/2010**

**IN THE MATTER OF:**

M/s Tarini Infrastructure Ltd.

**...APPLICANT/PETITIONER**

**Versus**

Gujarat Urja Vikas Nigam Ltd. & Ors.

**...RESPONDENTS**

**CONSOLIDATED VOLUME OF DOCUMENTS**

**VOLUME I**

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**PAPER BOOK**

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**HEMANT SINGH/ MATRUGUPTA MISHRA/ SHIKHA OHRI  
ADVOCATES FOR THE PETITIONER**

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THROUGH

  
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DATED: 05.06.2017

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**DATED: 05.06.2017**

# ANNEXURE-P-1

## Tariff determination for Hydro power

S No	Particulars	Normative Pe	Tarini	Rs in lacs
				31.03.2014
1	Capacity of plant ( MW)	500 MW	5.6	
2	Capital Cost	6cr/ NW	6713.9	6713.9
3	Debt equity Ratio	70:30:00	70:30:00	
4	Return on equity	15.50%	312	
5	Interest on loan	10%	713.37	13.50%
6	Working Capital(10% of CAPITAL)	300.cr	671.39	
7	Interest on working capital	10%	90.64	13.50%
8	Depreciation Rate	5.28%	354.49	
9	Operation & Maintanance	2% of project	134.28	
10	Plant Availability factor(MU)	62%	30.41	
11	Auxiliary energy consumption	1%	490560	
12	Plant Life ( Hydro)	35	35	
* Data as per CERC tariff regulation for 2009-2014				
	Equity	2599		
	Bank loan	3565		
	debt/equity	1.37		
	EXCESS CAPITAL			
	ROI			
	capital cost	6713		Modified
	Debt equity	70:30:00		
	Equity	2013.9		2013.9
	Debt	4699.1		5284.2
	ROI	312.1545		
	excess capital treated as loan	585.1		
	Fixed Cost			
	Return on equity	15.50%	312.15	15.50%
	Interest on loan	10%	713.37	13.50%
	Interest on working capital	10%	90.64	13.50%
	Depreciation Rate	5.28%	354.49	
	Operation & Maintanance	2% of project	134.28	
	Total		1604.93	
	Gross Energy generated	62% of install	30414720	
	Aux cons 1%		304147	
	Net Energy generated		30110573	
1	Fixed cost/net annual geneartion		5.33	
2	Variable cost:			
	Royalty	0.23	0.23	
	Total tariff		5.56	

ANNEXURE-P-2

2

CERC 2010-11 -TARINI

APPLICABLE FOR TARINI

Sno	Assumption Head	Sub Head	Sub Head-2	Unit	Other State
1	Power Generation	Capacity	Installed Power Generation Capacity Capacity Utilization Factor Auxiliary Consumption Deration Factor Useful Life Years	MW % % % years	1 42% 1% 0.00% 35
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	1203
3	Source of Fund	Debt: Equity	Tariff Period years Debt Equity Total Debt Amount Total Equity Amount Loan Amount Moratorium Period  Repayment Period(Includ Moratorium) Interest Rate Equity amount Normative ROE( Post Tax) Return on Equity for first 10 years  RoE Period Return on Equity 11th year onwards  Weighted Average of ROE Discount Rate	years % % Rs lacs Rs lacs Rs Lacs Years  years % Rs lacs % %  years %  % %	35 70% 30% 842.1 360.9 842.1 0  10 13.39% 360.9 16% 19%  10 24%  22.57% 16.14%
4	Financial Assumptions	Economic assumption  Fiscal Assumptions  Depreciation	Coal Price Escalation HSD Price Escalation Discount Rate  Income tax  Mat Rates (first 10years) BDIA benefits  Depreciation Rate for first 10 years % Depreciation Rate 11th year onwards % Years for 7% rate	% p.a % p.a % p.a  %  Yes/No  % % %	0.00% 0.00% 16.00%  33.99% 17.00% Yes  7.00% 0.80% 10
5	Working Capital	For Fixed Charges O & M Charges Maintenance Spare Receivables for Debtors  Interest on working capital	% of O&M expense	Month % Months %	1 15% 2 12.89%
6	Operation & Maintenance	O&M Expenses (FY 10-11)	% of base capital cost	%	39.699 5.72%

### Determination of Tariff Components

[illegible]

Fixed Cost	Unit	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Q&M	Rs Lakh		39.70	41.97	44.37	46.91	49.39	52.48	55.49	58.60	61.95	65.49	69.24	73.20	77.39	81.81	86.49
Depreciation	Rs Lakh		84.21	84.21	84.21	84.21	84.21	84.21	84.21	84.21	84.21	84.21	84.21	84.21	84.21	84.21	84.21
Interest on Term Loan	Rs Lakh		207.32	95.84	61.57	73.29	52.02	50.74	38.47	28.19	16.91	5.64	-	-	-	-	-
Interest on Working Capital	Rs Lakh		2.63	2.76	2.71	2.66	2.63	2.57	2.52	2.48	2.45	2.41	1.96	2.09	2.10	2.17	2.25
Return on Equity	Rs Lakh		66.57	66.57	66.57	66.57	66.57	66.57	66.57	66.57	66.57	66.57	66.57	66.57	66.57	66.57	66.57
Total Fixed Cost	Rs Lakh		392.42	294.35	264.43	275.64	267.00	256.51	250.13	242.05	234.09	225.31	167.44	171.47	175.73	180.22	184.44

Levelised tariff corresponding to Useful Life

Per unit cost of Gas																
Unit	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
G&M	Rc/kWh	0.11	0.11	0.12	0.13	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.21	0.22	0.24
Depreciation	Rc/kWh	2.39	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29
Interest on Term Loan	Rc/kWh	2.61	2.61	2.60	1.89	1.69	1.39	1.07	0.77	0.46	0.15	0.00	0.00	0.00	0.00	0.00
Interest on Working Capital	Rc/kWh	0.08	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.05	0.06	0.06	0.06	0.06	0.06
Return on Equity	Rc/kWh	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	2.35	2.35	2.35	2.35	2.35
Total COG	Rc/kWh	7.25	6.95	6.93	6.35	6.04	5.74	5.45	5.15	4.85	4.55	2.86	2.87	2.88	2.90	2.91

[illegible]

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16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
91.44	95.67	102.10	108.05	114.23	120.76	127.67	134.97	142.69	150.85	159.48	168.60	178.25	188.44	199.22	210.62	222.66	235.40	248.87	263.10
9.62	9.62	9.62	9.62	9.62	9.62	9.62	9.62	9.62	9.62	9.62	9.62	9.62	9.62	9.62	9.62	9.62	9.62	9.62	9.62
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.34	2.42	2.52	2.62	2.72	2.89	2.96	3.07	3.20	3.34	3.48	3.67	4.15	4.94	4.55	4.76	4.99	5.23	5.23	5.23
86.62	86.62	86.62	86.62	86.62	86.62	86.62	86.62	86.62	86.62	86.62	86.62	86.62	86.62	86.62	86.62	86.62	86.62	86.62	86.62
190.02	195.33	200.96	206.91	213.19	219.88	226.88	234.28	242.19	250.43	259.10	268.21	278.64	289.01	300.01	311.62	323.89	336.67	350.34	364.57

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0.15	0.26	0.18	0.29	0.31	0.33	0.35	0.37	0.39	0.41	0.43	0.46	0.48	0.51	0.54	0.57	0.61	0.64	0.69	0.72
0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.09	0.09	0.11	0.11	0.12	0.12	0.13	0.14	0.14	0.14	0.14
2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39
2.39	2.94	2.96	2.98	3.00	3.02	3.04	3.07	3.09	3.12	3.14	3.18	3.21	3.25	3.28	3.32	3.36	3.40	3.43	3.47

0.072394	0.05982	0.050127	0.04107	0.035218	0.029529	0.02481	0.020981	0.01745	0.01463	0.01227	0.01029	0.00869	0.00724	0.00607	0.00509	0.00427	0.00350	0.003	0.00252
----------	---------	----------	---------	----------	----------	---------	----------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	-------	---------



000005

Small Hydro Project

Concession Agreement

ANNEXURE-P-3

## Bid Document

For

### Selection of a developer (On Swiss Challenge Route)

For

### Setting up Small Hydro Power Stations on DamanGanga (Madhuban) Dam, Gujarat

Issued to Tarini Infrastructure Ltd, New-  
Delhi on 9-11-2006

*P. S. Mehta*  
Divisional Accountant  
Damanganga Project Dn. No. 1  
Madhuban Colony

Issued by

Narmada, Water Resources, Water Supply and Kalpsar Department  
Government of Gujarat  
Gandhinagar.



000006

**INVITATION FOR BIDS NOTIFICATION**

Narmada, Water resources, Water Supply and Kalpsar Department,  
Government of Gujarat

An invitation for "Competitive Bids against a bid received for setting up a small hydro power project at Daman Ganga (Madhuban) Dam, Gujarat ; on Design, Build, Finance, Operate & maintain and Transfer basis."  
(Swiss Challenge Route)

Narmada, Water Resources, Water Supply and Kalpsar Department, Government of Gujarat (NWR,WS&KD, GoG) has received a proposal to set up 5 MW Hydro Power Plant on Daman Ganga (Madhuban) Dam, in Valsad district from a private sector developer ("original proponent"). The project is proposed to be implemented on Design, Build, Finance, Operate, Maintain basis and Transfer the project after 35 years. The said proposal is considered by NWR,WS&KD under section 10 of Gujarat Infrastructure Development Act, 1999 (GID Act, 1999).

NWR,WS&KD, GoG now invites proposals from Intending bidders to Design, Build, Finance, Operate, Maintain and Transfer the project after 35 years under section 10 of the GID Act, 1999. Under the provisions of the said act, NWR,WS&KD will evaluate each of the qualified bidders' bids for its technical viability. All the technical viable proposals will be evaluated for financial parameter. If any bidder offer a financial proposal which is superior to the proposal of the original proponent, the original proponent will have first right of refusal i.e. the original proponent will have right to match the best financial proposal and if the original proponent agrees to match the best proposal, he will be awarded the project otherwise the project will be awarded to the bidder who have offered the best bid. The process is popularly known as "Swiss Challenge Route".

Interested parties can collect the Bid document containing the Concession Agreement proposed to be entered into with the successful Bidder, along with the detail information required to be submitted by the Bidder against a non-refundable payment of Rupees Ten Thousand Only in the form of a Demand draft in favour of "Executive Engineer Damanganga Project Dn No 1, Madhuban Colony". Payable at Silvassa. The draft should be submitted and the Bid document could be collected accordingly from the address given below. The bid documents will be available for sale on all working days between 11.00 hrs and 17.00 hrs between 16-10-2006 to 9-11-2006. The timetable for the bid process is as follows:

The bids duly filled in should be submitted to the Superintending Engineer Damanganga Project Circle, Valsad, Dist. Valsad by R.P.A.D. / Speed post. Right to reject any or all bids rests with Narmada Water Resources, Water Supply and Kalpsar Department.

Date	Event
16-10-2006	Commencement of Sale of Bid documents
9-11-2006	Last date of Sale of Bid documents
29-11-2006	Bid clarifications, conferences etc.
8-12-2006	Submission of Responses of Bid
8-1-2007	Evaluation, selection of Developer (Tentative)
7-2-2007	Issue of LOI (Tentative)
7-3-2007	Signing of Concession Agreement (Tentative)

If any of the dates mentioned above is declared a public holiday, the deadline will be the next working day.

The Bid documents are not transferable.

Office of

Executive Engineer, Damanganga Project Dn.No.1, Madhuban Colony,  
Narmada, Water Resources, Water Supply and Kalpsar Department,  
Government of Gujarat,

P.O. KARAD, D.P. PIN. : 396 240. Via. SILVASSA (D.&N.H.)

Telephone No.0260 - 2640213, Fax No. : 0260 - 2640213.

E-Mail



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## 1. INTRODUCTION

- 1.1 Narmada, Water Resources, Water Supply and Kalpsar Department, Government of Gujarat (herein after referred as "the department") is involved in planning the use of available water resources in accordance with the policy of state, making use of available water resources for maximization of irrigation benefits, making conjunctive use of water resources to maintain the water balance as well as generation of hydro power wherever feasible. The NWR&WS department has built dams on many river sites for the purpose of providing water for drinking and irrigation purposes in various part of the state. One of such dam is built on Daman Ganga river at village Madhuban, Valsad District in South Gujarat wherein hydro power generation is envisaged for which penstock are already installed in body wall of the dam during its construction. The details of the project site, dam, water flow and other relevant data is given in the Chapter 5 of this document.
- 1.2 The department has received a proposal from a private sector developer (hereinafter referred to as "the original proponent") to Design, Build, Finance, Operate, Maintain a Small Hydro Power Project of 5 MW(3MW on existing concrete outlets and 2MW on existing Right Bank Canal) capacity on Daman Ganga dam and transfer the project to department at the end of 35 years of concession period.
- 1.3 The department has in-principally agreed to the proposal of the original proponent and accepted the same under the section 10 of the Gujarat Infrastructure Development Act, 1999 (GID Act, 1999).
- 1.4 The intent of this bid document is to invite counter competitive offers from qualified persons under the provisions of the said act. The brief description of the provisions of the said act are (popularly known as "Swiss challenge route"):
  - A proposal for undertaking any project may be submitted by any person to the Government where Government has not prepared the proposal and proposed concession for undertaking the project yet.
  - The Government may consider the proposal from technical and financial aspects and modify it if necessary.
  - Once accepted, the Government may submit the proposal for the recommendations of Gujarat Infrastructure Development Board (GIDB) for the proposed project.
  - Upon acceptance of GIDB's recommendations, the Government department shall adopt the proposal of the person ("original proponent") as basis for selecting a person with whom concession agreement for undertaking the project may be entered into and for selecting such person; the Government shall follow the procedure of competitive public bidding.



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- Where a person is selected following the procedure of the competitive public bidding ("the selected person") the proposal of the selected person shall be compared with the proposal of the original proponent. Where the proposal of the original proponent is not preferable to the selected person, the original proponent shall be given an opportunity to make his proposal competitive with that of the selected person within a period of thirty days from the date on which he has been given the opportunity and where the original proponent fails to do so within the said period, the Government may enter into a contract with the selected person.

1.5 The department now invites detailed proposals from all intending bidders under the provisions of the GID act, 1999.



## 2. INFORMATION AND INSTRUCTION TO BIDDERS

- 2.1 NWRWS&K department, Government of Gujarat has received a proposal to implement a 5 MW(3MW on existing concrete outlets and 2MW on existing Right Bank Canal) Hydro Power Generation project from a private developer. The details of the said location, dam, water flow data and other relevant information is provided in the Chapter 5 of this bid document. The said proposal has been accepted by the department under GID Act, 1999. Under the provisions of the said act, NWRWS&K department now invites competitive bids for the same project. The procedure to be followed in this case is outlined in section 1.4.

### 2.2 *Specifications for the project*

#### 2.2.1 Size and Location

The Bidder must propose a minimum size of 5 MW of Hydro Power Generation Project to be implemented at project site. The NWRWS&K department shall reject any bid which has proposed installed capacity below 5 MW. As per the assessment of the original proponent and as per the assessment of the NWRWS&K department, the potential at the proposed site is of 5 MW. However, the bidder may suggest any higher capacity, in which case the bidder must justify the technical feasibility of the project. The department shall evaluate such technical proposal and if the same is not found technically viable, such proposal shall be rejected. The decision of NWR&WS department shall be final in this regards.

#### 2.2.2 Choice of Technology

The project may use any technology for the implementation of the project. However, the Bidder must clearly indicate the technology and provide the details of all the technical aspects of the project in the bid.

### 2.3 *Project Completion Schedule*

- 2.3.1 The Bidder shall achieve Scheduled Commercial Operation Date within 24 months from the signing of the Concession Agreement.
- 2.3.2 If the completion of the plant is delayed beyond the Scheduled Commercial Operation Date as indicated by the successful Bidder at the time of signing of Concession Agreement, due to any reason attributable either to the selected Bidder or his contractors, except for Force Majeure conditions (as specified in the Concession Agreement), the NWRWS&K department shall levy such liquidated damages as specified in the Concession Agreement.



## 2.4 Clearances

The Bidder shall be responsible for obtaining all the clearances/ approvals, wherever required, from Central/ State government, and statutory bodies, for the implementation of the project and thereafter for the supply of power. All expenses for obtaining the clearances/ approvals shall be borne by the Bidder. The department may provide reasonable assistance to the selected bidder in getting all the clearances from the state government.

## 2.5 Sale of power

- 2.5.1 The selected bidder (concessionaire) can use the electricity generated from the power project for its own captive consumption. If the concessionaire does not want to use the electricity generated for captive consumption or he has excess capacity available, he can sale the electricity generated from the power project to Gujarat Urja Vikas Nigam Ltd (GUVNL). The sale of electricity and the tariff which can be charged shall be determined by Gujarat Electricity Regulatory Commission (GERC as per the power granted under the Electricity Act, 2003 and the Gujarat Electricity Industry (Reorganisation & Regulation) act 2003). Third party sale of electricity shall be governed by the policy of Government of Gujarat from time to time.
- 2.5.2 The concessionaire shall also ensure delivery of power at the Interconnection Point in a safe and reliable manner so as to avoid fluctuations and disturbances to the Grid System due to parallel operation.
- 2.5.3 The concessionaire shall be responsible for taking any permissions/licenses from any of the authority in order to sale the power.
- 2.5.4 Concessionaire hereby agrees that, he will enter into long term supply agreement with any user only for the maximum period of the Concession Agreement less the construction period. The concessionaire shall not enter into any agreement for supply of electricity with any user to supply the electricity beyond the Concession Period.

## 2.6 Project development expenses

The successful bidder may require to pay maximum amount of Rs. 5 Lacs/MW to the department as project development expenses as per the provisions of the concession agreement.



## 2.7 Bid security

- 2.7.1 Each Bidder shall submit bid accompanied by a refundable bid security of Rs. 25 Lakhs (Rs 5 Lakhs per MW of the Project Capacity) in the form of Bank Guarantee (as per the format attached in Annexure 1, Format 5). The Bank Guarantee shall be from Nationalised/Scheduled/Foreign Bank with office in India.
- 2.7.2 For unsuccessful Bidders the Bank Guarantee shall be released within 30 (thirty) days of selection of developer and issuance of the LOI.
- 2.7.3 For the successful Bidder the Bank Guarantee shall be released upon submission of the performance guarantee as stipulated in the concession agreement.
- 2.7.4 The Bank Guarantee can be invoked on account of (but not limited to) the following:
- If the bid is withdrawn during the bid validity period;
  - If the selected bidder back out and refuses to pay performance guarantee and enter into the concession agreement.

## 2.8 Pre-bid Conference

- 2.8.1 The Bidder or his official representative is invited to attend pre-bid meeting which will take place at the office of the NWRWS&K department. The pre-bid conference will be convened on dt.29/11/2006 at 12.00 hours. at Block No.9, 4th floor committee room, sachivalaya Gandhinagar.
- 2.8.2 The purpose of the meeting will be to clarify any issues regarding the bid process.
- 2.8.3 The Bidder is requested to submit questions in writing or by cable to reach the department at the address indicated below one week before the pre-bid meeting. Address- Superintending Engineer, Damanganga Project Circle 2nd Floor, Damanganga Bhavan, Dist. Valsad Ph. No. 02632-253096, Fax. 02632-253308
- 2.8.4 Record notes of the meeting including the text of the questions raised and responses given will be transmitted to all the purchasers of the bid document. The clarifications that could not be furnished during pre-bid conference will be separately communicated to all the purchasers of the bid document.
- 2.8.5 Non-attendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.

## 2.9 Clarification to be sought

If any clarification is to be sought by any bidder, the same shall be communicated to the department in writing, at least one week before the date of submission of the bid. The





clarification, if any, in response to any such query received by the department shall be communicated to all the bidders.

## 2.10 Amendment of bid document

- 2.10.1 At any time prior to the deadline for submission of bids, the department may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the bidding documents, including the concession agreement, by an amendment.
- 2.10.2 The amendment shall be notified in writing through a letter or by telex or fax or cable to all prospective Bidders who have purchased the bidding documents and shall be binding on them.
- 2.10.3 In order to afford prospective Bidders reasonable time to take the amendment into account in preparing their bids, the department may, at its discretion, extend the deadline for the submission of bids.

## 2.11 Bidder to inform himself fully

- 2.11.1 The information regarding the dam, dam height, water flow and other site related information has been provided in the Chapter 5. However, the Bidder shall make independent enquiry and satisfy himself as to all the required information, inputs, conditions and circumstances and factors that may have any effect on his technical and financial bid. In assessing the bid it is deemed that the Bidder has inspected and examined the site conditions and its surroundings, examined the laws and regulations in force in India, the conditions of roads, bridges, ports, etc. for unloading and/or transporting heavy pieces of material and to have based its design, equipment size and all such relevant conditions and also the risks, contingencies and other circumstances which may influence or affect the bid.
- 2.11.2 The department shall not permit any change in time schedule or any financial adjustment arising thereof which are based on lack of clear information of such site conditions, laws and regulations and other related information and/or its effect on the premium quoted in the bid.

## 2.12 Preparation cost

The Bidder shall be responsible for all the costs associated with the preparation of the bid and participation in discussions. The department shall not be responsible in any way for such costs, regardless of the conduct or outcome of this process.



## 2.13 Information Required

2.13.1 The information against this document will be submitted by the Bidder as per the annexure attached in this document. The details of the information to be submitted are specified in Chapter 4 (Formats of Application) of this document.

2.13.2 Strict adherence to the formats wherever specified, is required. Wherever, information has been sought in specified formats, the Bidder shall refrain from referring to brochures/pamphlets. Non-adherence to formats and/or submission of incomplete information may be grounds for declaring the bid non-responsive. Each format has to be duly signed and sealed by the Bidder.

2.13.3 The Bidder should note that:

- a) If the Bidder deliberately gives wrong information in its response, to create circumstances for the acceptance of its bid, the department reserves the right to reject such bid and/or cancel the award, if made.
- b) Responses submitted by the Bidder shall become the property of the department and the department shall have no obligation to return the same to the Bidder.

## 2.14 Content of the proposals

2.14.1 In case of bids submitted by a consortium

2.14.1.1 The submitted proposal must mention the lead member and the lead member should designate one person to represent the consortium in its dealings with the department. The person should be authorized to perform all tasks including, but not limited to providing information, responding to enquiries, entering into contractual commitment on behalf of the consortium, etc.

2.14.1.2 The submitted proposal should also contain signed letters ("Letter of Consent") submitted by each member of the consortium, stating that the entire proposal has been reviewed and each key element of the proposal is agreed to and stating the investment commitment for the envisaged project. Any substantive exception should be addressed in the letter.

2.14.1.3 Any other request for change in the membership of the consortium, or in responsibilities, or in equity commitments of any consortium member is allowed, however, such change must be communicated to the department in writing for its approval. The department reserves the right to cancel the Award of project to the consortium, which in its opinion adversely affects the consortium strength and doesn't meet the qualification criterion as mentioned in this document. Accordingly the Bank Guarantee shall be forfeited in such cases.



## 2.14.2 In case of bids submitted by a Bidding company

2.14.2.1 The Bidding Company should designate one person to represent the Bidding company in its dealings with the NWR&WS department. The person should be authorized to perform all tasks including, but not limited to providing information, responding to enquiries, etc.

2.14.2.2 Bidding Company should provide a letter of commitment for the investment of equity amount as proposed in the bid. Any request for change in the promoters of the Bidding company, or in responsibilities, or in equity commitments of any promoters is allowed, however, such change must be communicated to the NWR&WS department in writing for its approval. The NWR&WS department reserves the right to cancel the Award of project to the Bidding Company, which in its opinion adversely affects the Bidding company strength and doesn't meet the qualification criterion as mentioned in this document. Accordingly the bid security may be forfeited in such cases.

## 2.15 Method of submission of the bids

The bidders are required to submit the RFQ and RFP in two separate sealed envelopes. The general conditions of the bid submission which the bidder needs to comply are as below:

2.15.1 The Bidder has the option of sending his response by registered post /Speed post, so as to reach the department at the designated address by the time and date stipulated by the department. Responses submitted by telex/telegram/fax shall not be considered under any circumstances. The department shall not be responsible for any delay in receipt of the bids. Any response received by The department after the deadline for submission of the responses stipulated by The department shall not be opened.

2.15.2 All pages of the bid submitted must be initialed by the authorized signatories on behalf of the Bidder.

2.15.3 *The bid shall be submitted in original copy (placed in one envelope).* No change or supplemental information to a proposal will be accepted after its submission. The department reserves the right to seek additional information from the Bidders, if found necessary, during the course of evaluation of the proposal.

2.15.4 If the envelope is not sealed and not marked as per the requirement, The department will assume no responsibility for the bid's misplacement or premature opening.

2.15.5 The bidder should note that:

- Language of the bids shall be English only.
- Bidders shall mention the name of the contact person and complete address of the Bidder in the covering letter.



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- Bids that are incomplete i.e. which do not substantially meet the requirements prescribed in this bid document and which do not submit the Bank Guarantee; will be rejected by the department.
- Bidders delaying in submission of additional information or clarifications sought, may be liable for rejection.
- If in response to this proposal, the Bidder makes any claim, which does not reflect the truth or is material misrepresentation of facts, then the bid would be liable for rejection.
- The department reserves the right to reject all or any of the proposals without assigning any reasons whatsoever.

## 2.16 Submission of the bid

2.16.1 The bidder shall submit the RFQ and RFP bids in separate sealed cover as under

(A) Request for Qualification.

(1) Cover no.1 : RFQ

(B) Request for Proposal.

(1) Cover no.2 : Technical bid

(2) Cover No.3 : Price bid

Each outer cover shall be marked as:

"RFQ / RFP Bid for implementation of 5 MW(3MW on existing concrete outlets and 2MW on existing Right Bank Canal) Daman Ganga (Madhuvan) Small Hydro Power Generation Project

"Narmada, Water Resources, Water Supply and Kalpsar department, Government of Gujarat"

"Name of the Bidder \_\_\_\_\_"

2.16.2 Both the sealed cover (containing RFQ and RFP bids) shall be placed in an outer cover marked as:

"Bid for implementation of 5 MW(3MW on existing concrete outlets and 2MW on existing Right Bank Canal) Daman Ganga (Madhuvan) Small Hydro Power Generation Project

"Narmada, Water Resources, Water Supply and Kalpsar department, Government of Gujarat"

"Name of the Bidder \_\_\_\_\_"

2.16.3 The RFQ and RFP bid shall include all the information as sought for and mentioned in the Chapter 4.

2.16.4 The RFQ bid shall include the requisite bid security in the format as specified in Annexure - I.



2.16.5 The RFP bids shall be submitted by the Bidder in two volumes in two different envelopes -

- Volume I - Technical Information, as per Annexure - II.
- Volume II - Financial Information, as per Annexure - III.

2.16.6 The envelopes should be transcribed in the following way;

First Envelope superscript - "Bidder Name- \_\_\_\_\_"  
(cover No.2) "RFP Volume I : Technical Information"

Second Envelope superscript - "Bidder Name \_\_\_\_\_"  
(cover No.3) "RFP Volume II: "Financial Information"

Both the envelopes shall be placed in one envelope marked as specified in 2.16.1. The information to be submitted for each volume is specified in Chapter 4 (Formats of Application) of this document.

2.16.7 It may please be noted that the covering letter and Volume I of the bids shall not contain any financial information i.e. information related to the premium quote.

## 2.17 Opening of the bid

2.17.1 First, the envelope of the RFQ bids shall be opened in the presence of the bidders on the date as would be specified by the NWR&WS department in the office of the Chief Engineer (S.G.) & Addl. Secretary, 2nd Floor, Block No.9, Sachivalaya, Gandhinagar. The RFQ bids of each bidder shall be evaluated as per the pre-qualification criteria mentioned in Chapter 3.

2.17.2 The RFP bids of only those bidders who have been qualified as per the pre-qualification criteria mentioned in this document would be opened. Volume I (technical bid) of RFP bid would be opened in the presence of one representative from each qualified Bidder, on the date as would be specified by the department.

2.17.3 The following information from each bid will be read out to all Bidders at time of opening of Volume I

- Name of the Bidding Company / Companies in case of Bidding Consortium.
- Proposed Plant capacity.
- Time schedule for completion of project.



2.17.4 The department shall carry out the technical bid evaluation as specified in Chapter 3. The financial bids (Volume II of RFP) of only those bidders whose bids have been technically qualified shall be opened in the presence of technically qualified bidders. The amount of premium quoted by each bidder shall be read out at the time of opening the financial bid.

## 2.18 Validity of the Offer

2.18.1 The offer shall remain valid for a period of not less than six months from the last date of proposal submission. The department reserves the right to reject any proposal which does not meet this proposed validity requirement.

2.18.2 In exceptional circumstances, the department may solicit the bidder's consent for an extension of the period of validity. The request and the responses thereafter shall be in writing. A bidder may refuse the request; in that case the bid of the bidder shall not be considered further and the department shall return the bid security to the bidder. A bidder accepting the department's request for validity extension shall not be permitted to modify the bid. The validity of the bank guarantee furnished by the bidder shall also be suitably extended.

## 2.19 Bid submission date

2.19.1 The Bidders should submit the response so as to reach the following address by 16.00 hrs on dt.8/12/2006 to Superintending Engineer, Damanganga Project Circle, 2nd floor, Damanganga Bhavan, Valsad Pin 396 001 Phone 02632-253096. Fax 02632 -253308 By R..P.A.D. / Speed post.

2.19.2 Important deadlines are mentioned below:

Date	Event
16/10/2006	Commencement of Sale of Bid documents
9/11/2006	Last date of Sale of Bid documents
29/11/2006	Bid clarifications, conferences etc.
8/12/2006	Submission of Responses of Bid
8/1/2007	Evaluation, selection of Developer
7/2/2007	Issue of LOI
7/3/2007	Signing of Concession Agreement

2.19.3 Late proposals: The proposals which are received after the time and date as mentioned above, shall be rejected summarily. Such a proposal would be marked by the department as "Late Proposals" and shall be returned back to the bidder unopened.



## EVALUATION CRITERIA

### RFQ bid evaluation

3.1.1 The bid evaluation process comprises of the following two steps:

1. Step I – Responsiveness check.
2. Step II – Bidder evaluation.

#### 3.1.2 Step I - Responsiveness check

The Bids submitted by Bidders/ Bidding Consortia shall be initially scrutinized to establish "Responsiveness". The following conditions may cause the bid to be deemed "Non-responsive":

- Sufficient information not submitted for the bid to be evaluated and/or information not submitted in specified formats;
- Bid not signed by authorised signatory and / or sealed in the manner and to the extent indicated in this Invitation for Bids;
- Bid submitted by a Bidding Consortium not including the letter from individual consortium members;
- Bid submitted by Bidding Company not including the equity investment commitment letter;
- Bid not accompanied by a valid bid security as specified in the bid document;
- A firm shall submit only one bid in the same Bidding process, either individually as a Bidder or as a partner of a joint venture or consortium. No firm can be a subcontractor in any other bid while submitting a bid individually or as a party of a joint venture or consortium in the same Bidding process. A firm, if acting in the capacity of Subcontractor in any bid, may participate in more than one bid, but only in that capacity. A Bidder who submits, or participates in more than one bid will cause all the proposals in which the Bidder has participated to be disqualified.

#### 3.2 Step II - Bidder evaluation

3.2.1 Step II (Bidder evaluation) will be carried out as per following pre-qualification criteria considering the information furnished by Bidders as prescribed under Chapter 4 - Format of Application.

##### 3.2.2 Physical <sup>adequate Capability of</sup>

Bidder shall have <sup>experience of</sup> ~~adequate~~ hydro power project in the name of his own bidding company or their consortium or their consultant



### 3.2.3 Financial

The bidders will be evaluated on following parameters:

- The bidder shall show profitable business;
- Minimum average annual turnover (of last three years') of Rs 3.125 crore and
- Net worth of Rs. 1.25 crore .

Note : The bidding company shall have to declare the name of their consultant along with their Bio-Data and experience of the work .The bidding company shall give the under taking that they will not change the services of their consultant during the course of execution of the contract. In case need arised in extreme case, the prior approval of the department shall have to be taken

3.2.4 If a bid is submitted by Bidding Company, then only the Financial Parameters of Bidding Company shall be considered. If the Bid is submitted by a Bidding Consortium, then the Bidding Parameters shall be arrived at by taking weighted average i.e. by multiplying each consortium Member Companies financial parameter by the percentage of equity investment committed and adding all such values arrived at. Hence strength of the Bidding Consortium shall be calculated on the basis of collective strength of Member Companies.

3.2.5 The bidder or the bidding consortium shall demonstrate its technical capability to implement the project. The bidder / bidding consortium shall be evaluated on the basis of past experience in implementing similar projects.

3.3 Based on the evaluation, the department shall pre-qualify the bidders who meet any of the pre-qualification criteria mentioned in 3.2.1 or 3.2.2 and experience criteria mentioned in 3.2.4. The department will inform the decision to all the bidders. The RFP bids of the unsuccessful bidders shall be returned unopened along with the bid security. The RFP bids of only qualified bidders shall be further evaluated.

### 3.4 RFP Bid Evaluation

3.4.1 The RFP bid evaluation process comprises of the following four steps:

1. Step I -- Responsiveness check.
2. Step II - Technical evaluation of bids.
3. Step III - Financial evaluation of bids.
4. Step IV - Bidder selection.

#### 3.4.2 Step I - Responsiveness check

The Bids submitted by Bidders/ Bidding Consortia shall be initially scrutinized to establish "Responsiveness". The following conditions may cause the bid to be deemed "Non-responsive":





- o Sufficient information not submitted for the bid to be evaluated and/or information not submitted in specified formats as mentioned in this document;
- o Bid not signed by authorised signatory and / or sealed in the manner and to the extent indicated in this Request for Proposal;
- o Bid validity period is not as per the requirement mentioned in this document;
- o Bid not submitted as sought in specific formats.

### 3.4.3 Step II - Technical Evaluation of Bids

3.4.3.1 Step II (technical evaluation of bids) will be carried out based on information furnished under Volume I of RFP bid by Bidders as prescribed under Chapter 4 on Format of Application.

3.4.3.2 The evaluation would be based on the assessment of the following parameters:

- o Bidder proposing for the minimum plant capacity, as specified in the Article 1.1.1.3;
- o Proposed completion of construction period;
- o Any deviations from the proposed concession agreement;
- o Feasibility of the technical proposal.

3.4.3.3 Bids qualifying on Step I and Step II (as per 3.2.4 and 3.4.3), would qualify for evaluation in Step III i.e. financial bid evaluation. The financial bids of only those bidders who qualify in Step I and Step II shall be opened. The financial bids of the unsuccessful bidders in Step I or Step II shall be returned unopened along with the bid security.

### 3.4.4 Step III - Financial Evaluation of Bids

3.4.4.1 Step III (financial evaluation of bids) will be carried out based on information furnished under Volume II of RFP bid.

3.4.4.2 This Step would entail the evaluation of quoted premium per unit of energy generation. If any conditions are attached to the financial bid, such bids are liable to be rejected by the department.

3.4.4.3 The bids will be compared on the basis of the quoted premium per unit of energy generation to be paid to the department during the concession period.

3.4.4.4 In case, bids are received of varying capacities i.e. capacities more than 5 MW, and if the same are found technically viable and accepted by the department, the bids shall be evaluated by considering the higher capacities. In such case, the premium quoted shall be adjusted to as if the proposed capacity is 5 MW. All such premium then shall be compared to select the bidder who has quoted the highest premium.



### 3.4.5 Step IV - Bidder Selection

3.4.5.1 The bid of the Bidder who has quoted highest premium (herein after referred to as "selected bidder") per unit of energy as evaluated in Step III would be compared with that of the original proponent. If the premium offered by the selected bidder is higher than the premium offered by the original proponent, the original proponent shall be given an opportunity to make his proposal competitive with that of the selected bidder and a letter shall be sent by the department to the original proponent in this regards.

3.4.5.2 The original proponent shall be given a period of thirty days from the date he has been issued the letter to make his proposal competitive with that of the selected bidder.

3.4.5.3 If the original proponent fails to make his proposal competitive with that of the selected bidder within the stipulated time period, the project shall be awarded to the selected bidder otherwise the project shall be awarded to the original proponent.

3.4.5.4 If the project is awarded to the selected bidder, he would be invited for discussions. The endeavor would be to achieve the best financial and commercial terms regarding risk sharing, and project completion schedule in comparison with suitable benchmark terms acceptable to the department. However, there would be no negotiations on the premium amount.



## 4. FORMAT OF APPLICATION

4.1 This chapter prescribes formats for submission of information to ensure that information and data collected from each Bidder would be interpreted in a consistent manner. Hence it is required that all Bidders should submit information as per the formats indicated below.

### 4.2 Formats for RFQ

### 4.3 Bidder Information

#### Definitions

- i) Bidding company: If the bid for the proposed project has been made by a single company, it has been referred to as a Bidding company.
- ii) Bidding consortium: If the bid for the proposed projects has been made by more than one company, then this group of companies has been referred to as a Bidding consortium.
- iii) Member company: Each company in consortium has been referred to as a member company.

4.4 The reference to formats under Bidder information is to the formats attached under Annexure 1. The Bidders are required to provide following information:

#### 4.4.1 Information about the company/consortium

##### 4.4.1.1 For a Bidding Company

- Last three year's figures of Free Cash Flow from Business Operations, Annual turn over, profit, net worth as per the format provided in Annexure I. (please attach unabridged Balance Sheet, P&L account, profit appropriation, Chairman's speech, Auditors report, etc.).
- A letter from the Bidding Company committing investment of atleast Rs. \_\_\_\_\_ Crore.

##### 4.4.1.2 In case of bid submitted by a Bidding Consortium

Name the lead member of the consortium { as per Annexure 1, Format 1}

1. The role of each consortium member { as per Annexure 1, Format 1}
2. A Letter of Consent from each Member Company committing a specific investment.
3. For each Member Consortium, last three year's Annual Accounts for the calculation of Free Cash Flow from Business Operations (consisting of



unabridged Balance Sheet, P&L account, profit appropriation, Chairman's speech, Auditors report, etc.).

#### 4.5 Checklist for Bidders

The Bidder may use the checklist below to ensure that the bid submitted is complete in all respects.

- Covering Letter;
- Bid security in the form of Bank guarantee;
- Letter of consent from all consortium members;
- Letter of commitment by the bidding company;
- Initialing of all pages of bid by authorized signatory;
- Executive Summary;
- Last three year's Annual Accounts of Bidding Company or in case of a Bidding Consortium for each of the Member Companies.

Please note that the information requirement prescribed above is the minimum information required from the Bidders. The Bidder may provide additional information to support and supplement the above.

#### 4.6 Formats for RFP bid

The formats for submission of information are prescribed here to ensure that information and data collected from each Bidder would be interpreted in a consistent manner. Hence it is required that all Bidders should submit information as per the formats indicated below.

#### 4.7 Technical Information (Volume – I of RFP bid)

4.7.1 The details of information required for technical information are attached under Annexure 2. The Bidder shall provide a technical outline of the bid as under:

1. Details of proposed power plant
2. Land and water requirements including plans for meeting these requirements
3. Communication System
4. Time schedule for commencement of supply.
5. Pre-feasibility study/ Detailed Project Report, if available for reference
6. Design Energy data.
7. Details of the technology to be used.
8. Technical feasibility of the same at the proposed location.
9. Details of Turbine / generator to be used with brand name and detailed technical specifications.
10. Total useful life of the project.
11. Details of Evacuation facilities proposed.
12. Auxiliary consumption.
13. Plant Load factor.

14.Environmental study. The project should meet the required environmental standards as stipulated under various Acts.

4.7.2 The Bidder shall also ensure compatibility of the proposed plant with the grid requirements.

#### 4.8 Financial Information (Volume – II of RFP bid)

##### 4.8.1 Formats

- The reference to formats under financial information (Volume - II) is to formats attached under Annexure 3. Under this volume the Bidder would have to indicate.
- The premium to be paid to the NWR&WS department i.e. Rs per unit of energy generated.
- Project cost.
- Proposed financing structure.

##### 4.8.2 Details of project cost and means of finance

Details about Project cost and means of finance as per Annexure - III.

##### Note:

- Information on Project cost and means of finance will not be used as a basis for evaluation.
- Correctness and completeness of all the assumptions underlying the premium quoted shall be responsibility of the Bidder. Any change in actual project cost or other costs from the estimate will have no bearing on the premium quoted by the bidder.
- Bids having premium quoted with conditions may be liable for rejection.

#### 4.9 Checklist for Bidders

The Bidder may use the checklist below to ensure that the bid submitted is complete in all respects.

##### Volume I – Technical Proposal

- Covering Letter.
- Information requirement as per Annexure II
- Technical feasibility report.
- Time schedule for project completion.



**Volume II – Financial Proposal**

- Premium quote.
- Details about project cost and means of finance.

Please note that the information requirement prescribed above is the minimum information required from the Bidders. The Bidder may provide additional information to support and supplement the above.



*Bidder shall contact for field visit and field data*

The Superintending Engineer  
Daman Ganga Project Circle  
2nd floor, Daman Ganga Bhavan,  
Behind Old Collector Office,  
Dist.:- VALSAD  
Ph. No.: (02632)253096. Fax No. (02632)253308

*Bidder shall contact for Design data Design consideration.*

The Superintending Engineer,  
Central Design Organisation,  
Block No.9, Dr. Jivaraj Mehta Bhavan,  
Old Sachivalaya,  
GANDHINAGAR.



## 5. Details of Project location and water flow data :

### Daman Ganga (Madhuban) MINI HYDRO POWER PROJECT

Daman Ganga (Madhuban) dam was constructed across River Daman Ganga near village Madhuban, Taluka :- Kaparada Dist :- Valsad. At site is 30 Km. away from Vapi town. Dam is constructed for irrigation purpose. Civil works of Daman Ganga (Madhuban) dam was completed in year 1985. Other ancillary works like Radial gate, stop log gate, Gantry crane etc. in all respects were completed in year 1987.

Two numbers of penstock out lets are provided in Right non-over flow section and right bank main canal head regulator is provided at Ch.2675 m on R.B.E.D. Installation of parts like penstock steel bulkhead Gate leaf, trash rack was already completed. Penstock steel bulkhead 2 Nos. are kept open. Penstock gate leaf ( stop log ) can be operated through available auxiliary hoist of 20 MT of Gantry crane, but penstock stop logs are not provided.

The Right Divide wall is not constructed to the required design section & profile. The bid shall also include the construction to the required profile.

The protective civil works for river bed power house shall also have to be included in the bid with reference to the maximum T.W.L. of 55.50 m.

Following details and drawings are attached for reference.

1. Main features of the project.
2. Data sheet for small Hydro power project.
3. Statement showing yearly inflow, overflow, storage, Irrigation water usage, surplus etc. from year 1991 to 2006 given at Annexure A.
4. Statement showing 10 daily reservoir performance given at Annexure B.
5. Statement showing live storage capacity at different elevation given at Annexure C.





6. Statement showing daily overflow of water in cumecs given at Annexure D.
7. RBMC Daily discharge Table given at Annexure E.



## DRAWING

1. Index map.
2. Detail of intake block, Detail of penstock
3. Indicative Contour and site Plan of Daman Ganga (Madhuban).
4. Right divide wall with the truncated construction.



**MAIN FEATURES OF THE PROJECT :**

The dam site of Daman Ganga (Madhuban) Reservoir Project is located on Daman Ganga River, near village Madhuban, Taluka Kaparada of Valsad District. The salient features of the project are as under :-

**Location :**

<b>State</b>	:	<b>Gujarat</b>
<b>District</b>	:	<b>Valsad</b>
<b>River</b>	:	<b>Daman Ganga</b>

**Hydrology :**

i) Catchment area :		
In Gujarat	:	376 Sq. Km.
In Maharashtra	:	1318 Sq. Km.
In UT & DNH	:	119 Sq. Km.
<b>Total</b>		<b>1813 Sq. Km</b>
ii) Annual weighted rainfall		
Maximum	:	3780 mm
Minimum	:	1685 mm
Average	:	2382 mm
iii) Maximum flood	:	26850 cumecs
Routed flood	:	22040 cumecs

**Reservoir :**

<b>5. Gross storage</b>	:	<b>567.00</b>	<b>Mm<sup>3</sup></b>
Dead storage	:	65.00	Mm <sup>3</sup>
Live storage	:	502.00	Mm <sup>3</sup>
Evaporation	:	57.100	Mm <sup>3</sup>



Full Reservoir level	:	R.L. 79.86 m
Max. Reservoir level	:	R.L. 82.4m
Minimum Draw Down level	:	R.L. 61.6 m

**Dam :**

i)	Type	:	Earthen/Masonry
ii)	Length of dam	:	Earthen 2518m Masonry <u>352.3m</u> Total <u>2870.3 m</u>
iii)	Top of dam	:	R.L. <u>85.6 m</u>
iv)	Max. height (above deepest foundation level )	:	Earthen <u>58.6 m</u> Masonry 49.84 m
v)	Width of roadway	:	7.77 m
vi)	Steps (Adit)	:	Left : 59 m to 41.05 m Right : 60.96 m to 42.75 m
vii)	Spillway		
	Length of spillway	:	191.103 m
	Crest level of spillway	:	65.83 m
	Shape of crest	:	Ogee
	No. of radial gates	:	10 Nos.
	Size of radial gates	:	15.55 m x 14.02 m

6. Down Stream protective works : Roller Bucket with horizontal apron

Bypass Outlets (R.L.) : 55 m (SL) & 57 m (SL)  
in C.P. No.8 & 9 respectively



Full Reservoir level : R.L. 79.86 m

Max. Reservoir level : R.L. 82.4m.

Minimum Draw Down level : R.L. 61.6 m

**Dam :**

i) Type : Earthen/Masonry

ii) Length of dam : Earthen 2518m .

Masonry 352.3m

Total	2870.3 m
-------	----------

iii) Top of dam : R.L. 85.6 m.

iv) Max. height (above deepest foundation level) : Earthen 58.6 m  
Masonry 49.84 m.

Masonry 49.84 m

v) Width of roadway : 7.77 m

vi) Steps (Adit)

Left : 59 m to 41.05 m ,

Right : 60.96 m to 42.75 m

vii) Spillway

Length of spillway : 191.103 m

Crest level of spillway : 65.83 m

Shape of crest : Ogee

No. of radial gates : 10 Nos.

Size of radial gates : 15.55 m x 14.02 m

6. Down Stream protective works : Roller Bucket with horizontal apron

Bypass Outlets (R.L.) : 55 m (SL) & 57 m (SL)  
in C.P. No.8 & 9 respectively



## Canal System :

## R.B.M.C.

- i. Capacity : 34.76 cumecs
- ii. Type : Lined
- iii. Section : 4.5m x 2.6m
- iv. C.B.L. : R.L. 59.06 m
- v. F.S.L. : R.L. 61.66 m
- vi. Grade : 1 in 2500
- vii. Length : 45.54 Km
- viii. Head-Regulator :  
 Location : Right Earthen Bank Ch. 2675 m  
 (59.46 m SL)
- Design Discharge : 34.76 cumecs
- No. & size of  
 opening : 1 Nos. 2.74m x 2.74m
- ix. Gross Command Area  
 Command Area : 77,905 Ha.
- Culturable  
 Command Area : 51,138 Ha  
 Annual Irrigation : 21,866 Ha.



## 2. DATA SHEET FOR SMALL HYDRO POWER PROJECT

- 1 Name of Scheme : Daman Ganga (Madhuban) RESERVOIR SCHEME
- 2 Name of River : Daman Ganga
- 3 Latitude/Longitude : Long  $73^{\circ}$  -  $5'$  E  
Lati  $20^{\circ}$  -  $10'$  N
- 4 District. : Valsad

Following points required (For last 10 years data ) (Yearly 10 days data)

- 1 Discharge
  - a) Daily incoming flow in cumecs. : This data are given in 10 Daily Reservoir performance ANNEXURE - B
  - b) Daily overflow in cumecs. : Performance statement ANNEXURE - D for period 6-1994 to 12-2005.
  - c) Daily Discharge used for Irrigation in cumecs. : ANNEXURE - E period 6 -1999 to 5-2006
- 2 Head
  - a) Minimum head in Mtrs. : 1.1  
(72.2 - 61.60) 15.6 During period (94 to 2004 )  
w.r. to R.W.L.61.6 mt
  - b) Maximum head in Mtrs. : (79.86 - 61.60) 18.26 During period (94 to 2004 )  
w.r. to R.W.L.61.6 mt
  - c) Average head in Mtrs. :  $\frac{(15.6 + 18.26)}{2} = 16.93$  Mt.
- 3 Hydrology. : 1 Design Flood -26,850 M<sup>3</sup>/Sec.  
Routed Flood - 22,040 M<sup>3</sup>/Sec  
Max T.W.L. ~~55.50~~ m.  
100 Years flood  
observed before 14,896.6 M<sup>3</sup>/Sec  
Dam Construction.  
Truncated Right Dewide wall to be raised to its full profile with reference to maximum water boil level.



- 2 Total Evaporation losses considered is – 90 inches i.e.  $32.70\text{Mm}^3$
- 3 97% of the annual rainfall occurs during monsoon period (June to September )
- 4 Higher inflow then 100 years observed flood. 2004 – 6.16 lacs cusecs,
- 4 Details of penstock
- 1 Size :
- i. 2 Nos conduits size 1.52 x 1.52 Mt. Penstock provided with Penstock Gate at Upstream site
- ii. 34.60 Mt. Long (Drawing attached)
- iii Entry S.L. m.  
Exit S.L. m.
- 5 STORAGE CAPACITY : 502 MCM Live Storage.  
IN MCM 65 MCM Dead Storage.  
567 MCM Gross Storage.
- 6 Yearly incoming flood. : Ranging between  $5406\text{Mm}^3$  to  $1702\text{Mm}^3$   
Draught year – NIL.
- 7 Utilisation of tail race water. : Canal bed power – Water shall be used to recharge Vapi Pickup weir.
- 8 Climate Condition : 1. Temp. Varies from  $44^\circ$  to  $25^\circ\text{C}$   
2. Humidity is high between June to October while wind speed increases beyond 16 Km/Hr. in the month of May to August.
- 9 Location of nearest G.E.B. Sub – Station. : Nearest G.E.B. Sub-Station is less than 4 Km. From Dam Site.
- 10 Rainfall data
- a) Minimum : 1685.2 MM
- b) Maximum : 3379.3 MM
- c) Average : 2232.17 MM





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Bidder shall contact for field visit and field data

The Superintending Engineer  
Daman Ganga Project Circle  
Daman Ganga Colony No.1  
Tithal Road  
Dist.:- VALSAD  
Ph. No. 253096 Fax No. 253308

Bidder shall contact for Design data Design consideration.

The Superintending Engineer,  
Central Design Organisation,  
Block No.9, Dr. Jivaraj Mehta Bhavan,  
Old Sachivalaya,  
GANDHINAGAR.



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## ANNEXURE 1

RFQ Formats



**Format 1: Executive Summary**

1.1.a Name of the Bidding Company/Bidding Consortium

1.1.b Name of the Lead Member in the case of a Bidding Consortium

1.2 Details of the Bidding Consortium

S. No.	Name of the Company	Role Envisaged	% Equity contribution

1.3 Details of the contact person

Name

Designation

Company

Address

Phone nos

Fax Nos.

E-mail address

Signature \_\_\_\_\_

For

Bidder's Rubber Seal and Full Address



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### Format 1: Executive Summary

1.1.a Name of the Bidding Company/Bidding Consortium

1.1.b Name of the Lead Member in the case of a Bidding Consortium

#### 1.2 Details of the Bidding Consortium

S. No.	Name of the Company	Role Envisaged	% Equity contribution

#### 1.3 Details of the contact person

Name

Designation

Company

Address

Phone nos

Fax Nos.

E-mail address

Signature \_\_\_\_\_  
For

\_\_\_\_\_  
Bidder's Rubber Seal and Full Address



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## Format 2 – Financial Details

Name of Bidder/Consortium Member	Equity Contribution Proposed	Turnover (Rs. Million)			Networth (Rs. Million)
		Year 1	Year 2	Year 3	Year ---

Name of Bidder/Consortium Member	Free cash flow (Rs. Million)		
	Year 1	Year 2	Year 3

## Note :

- Attach audited financial statements of last three years.
- Please provide the above mentioned information fro each member in case of consortium.

Signature \_\_\_\_\_  
For

\_\_\_\_\_  
Bidder's Rubber Seal and Full Address



**Format 3 – Past Experience**

Please furnish the following information about past experience of the bidding company and of each of the member of the consortium.

- Brief about Hydro Power Projects implemented.
- Brief about any other Power Projects / Infrastructure projects implemented.
- Brief about Project implemented on Private Sector Participation, BOT arrangement with Government.
- Brief about experience in Operation and Maintenance of Hydro Power Projects / other Power Projects.
- Any other relevant experience.

Signature \_\_\_\_\_  
For

\_\_\_\_\_  
Bidder's Rubber Seal and Full Address



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**Format 4- Draft Covering Letter**

Bidder's Name:  
Full Address:  
Telephone No.:  
E-mail address:  
Fax / No.:

To

Address of the Office

Sub:- Implementation of (Name of project) on Design, Build, Finance, Operate, Maintain and Transfer basis.

Dear Sir,

We, the undersigned Bidder having read and examined in detail the Bid documents for implementation of (Name of the project) on Design, Build, Finance, Operate, Maintain and Transfer basis, hereby submit our response.

**CONTACT PERSON**

Details of contact person as specified in Format 1 are furnished as under:

Name  
Designation  
Company  
Address  
Phone Nos.  
Fax Nos.  
E-mail address

**Bank Guarantee**

We have enclosed a separate Bank Guarantee of Rs.[ ] lakh, in the form of Bank Guarantee as per your proforma (Annexure 1, Format 5) from a nationalized/ scheduled/ foreign bank with office in India.

We are enclosing herewith duly signed formats, in 1 original + [ ] copies as desired by you in your bid document for your consideration.

Dated the \_\_\_\_\_ day of \_\_\_\_\_ of 20

Thanking you,

Yours faithfully,

(Signature, Name, Designation and Company's Seal)  
Business Address:



## Format 5 – Bank Guarantee Format.

## FORMAT OF BANK GUARANTEE FOR BID SECURITY

(To be stamped in accordance with Stamp Act)

Whereas M/s \_\_\_\_\_ (herein after referred to as bidder) is desirous and preferred to bid for the project \_\_\_\_\_ in accordance with the terms and conditions of the bid document for the purpose of Design, Build, Finance, Operate and Maintain the project and whereas We, Bank, agree to give the bidder a guarantee for the Bid Security.

1. Therefore, we hereby affirm that we are guarantors on behalf of the bidder upto total rupees \_\_\_\_\_ (in words) Rs. \_\_\_\_\_ (in figure) and we undertake to pay to Executive Engineer \_\_\_\_\_ Division \_\_\_\_\_ Department of Government of Gujarat the \_\_\_\_\_ (name of Govt., previous notice of judicial or to be specified) upto his first written demand, without demur, without delay and without the necessity of a previous notice of judicial or administrative procedures and without the necessity to prove to the bank the defects or shortcomings or debits of the bidder any sum within the limit of Rs. \_\_\_\_\_.
2. We further agree that the Guarantee herein contained, shall remain in full force and effect during the period that would be taken for the acceptance of the bid. However, unless a demand of claim under this guarantee is made on us in writing on or before the \_\_\_\_\_ (date to be specified – will not be less than 180 days from the stipulated date to submission of the bid) we shall be discharged from all liabilities under the guarantee thereafter.
3. We undertake not to revoke the guarantee during its currency except with the previous consent of the Executive Engineer \_\_\_\_\_ Division \_\_\_\_\_ in writing.
4. We lastly undertake not to revoke the guarantee for any charge in constitution of the bid or of the bank.

Signature \_\_\_\_\_  
For \_\_\_\_\_

Date : \_\_\_\_\_

Banker's Rubber Seal and Full Address.





## Format 5 – Bank Guarantee Format.

## FORMAT OF BANK GUARANTEE FOR BID SECURITY

(To be stamped in accordance with Stamp Act)

Whereas M/s \_\_\_\_\_ (herein after referred to as bidder) is desirous and preferred to bid for the project \_\_\_\_\_ in accordance with the terms and conditions of the bid document for the purpose of Design, Build, Finance, Operate and Maintain the project and whereas We, Bank, agree to give the bidder a guarantee for the Bid Security.

1. Therefore, we hereby affirm that we are guarantors on behalf of the bidder upto total rupees \_\_\_\_\_ (in words) Rs. \_\_\_\_\_ (in figure) and we undertake to pay to Executive Engineer \_\_\_\_\_ Division \_\_\_\_\_ Department of Government of Gujarat the \_\_\_\_\_ (name of Govt., previous notice of judicial or to be specified) upto his first written demand, without demur, without delay and without the necessity of a previous notice of judicial or administrative procedures and without the necessity to prove to the bank the defects or shortcomings or debits of the bidder any sum within the limit of Rs. \_\_\_\_\_.
2. We further agree that the Guarantee herein contained, shall remain in full force and effect during the period that would be taken for the acceptance of the bid. However, unless a demand of claim under this guarantee is made on us in writing on or before the \_\_\_\_\_ (date to be specified – will not be less than 180 days from the stipulated date to submission of the bid) we shall be discharged from all liabilities under the guarantee thereafter.
3. We undertake not to revoke the guarantee during its currency except with the previous consent of the Executive Engineer \_\_\_\_\_ Division \_\_\_\_\_ in writing.
4. We lastly undertake not to revoke the guarantee for any charge in constitution of the bid or of the bank.

Signature \_\_\_\_\_  
For \_\_\_\_\_

Date : \_\_\_\_\_

Banker's Rubber Seal and Full Address.



**ANNEXURE 2**

FORMATS FOR  
TECHNICAL INFORMATION  
(RFP - VOLUME I)



**Format 1 — DRAFT FORMAT OF COVERING LETTER**

Bidder's Name:  
 Full Address:  
 Telephone No.:  
 E-mail address:  
 Fax / No.:

To  
Address of the Office

Sub:- Implementation of (Name of project) on Design, Build, Finance, Operate, Maintain and Transfer basis – Submission of Technical Bid.

Dear Sir,

We, the undersigned Bidder having read and examined in detail the bid documents for implementation of (Name of the project) on Design, Build, Finance, Operate, Maintain and Transfer basis, hereby submit our Technical Bid.

Capacity bid for: \_\_\_\_\_ MW

**Bid Validity**

We confirm that all the terms, conditions and premium of this proposal are valid for acceptance for a period of 6 months from the date of last date of bid submission i.e. \_\_\_\_\_.

**Project Completion**

We hereby confirm that the project shall commence strictly as per the time frame stipulated in the proposal.

**Familiarity with relevant Indian laws & regulations**

We confirm that we have studied the provisions of relevant Indian laws & regulations as required to enable us to quote for this bid and execute the contract, if awarded.

We are enclosing herewith Volume I i.e. Technical Proposal with duly signed formats, in 1 original + ( ) copies as desired by you in your bid document for your consideration.

Dated the \_\_\_\_\_ day of \_\_\_\_\_ of 20

Thanking you,  
 We remain,

Yours faithfully,

(Signature; Name, Designation and Company's Seal)

Business Address:

Name and address of principal Officer.



**Format 2 - TECHNICAL INFORMATION****Project Feasibility Report**

- Capacity proposed, no of units, size of each unit etc.
- Details of proposed power plant
- Land and water requirements including plans for meeting these requirements
- Communication System
- Time schedule for commencement of supply.
- Pre-feasibility study/ Detailed Project Report, if available for reference
- Design Energy data.
- Details of the technology to be used.
- Technical feasibility of the same at the proposed location.
- Details of Turbine / generator to be used with brand name and detailed technical specifications.
- Total useful life of the project.
- Details of Evacuation facilities proposed.
- Auxiliary consumption.
- Plant Load factor.
- Environmental study. The project should meet the required environmental standards as stipulated under various Acts.
- Implementation plan.

Signature \_\_\_\_\_  
For

\_\_\_\_\_  
Bidder's Rubber Seal and Full Address



**Format 3: Time Schedule for Commencement of Delivery**

The Bidder should submit the date on which the project facility will be completed..

Date of commencement	Capacity (in MW)

Signature \_\_\_\_\_  
For

\_\_\_\_\_

Bidder's Rubber Seal and Full Address.



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## ANNEXURE 3

FORMATS FOR  
FINANCIAL INFORMATION (RFP - VOLUME II)



## Format 1 --- DRAFT FORMAT OF COVERING LETTER

Bidder's Name:

Full Address:

Telephone No.:

E-mail address:

Fax / No.:

To

Address of the Office

Sub:- Implementation of (Name of project) on Design, Build, Finance, Operate, Maintain and Transfer basis- Submission of Financial Bids.

Dear Sir,

We, the undersigned Bidder having read and examined in detail the bid documents for implementation of (Name of the project) on Design, Build, Finance, Operate, Maintain and Transfer basis, hereby submit our Financial proposal in prescribed format.

We confirm that all the terms, conditions and premium of this proposal are valid for acceptance for a period of 6 months from the date of last date of bid submission i.e. \_\_\_\_\_.

We are enclosing herewith Volume II i.e. financial proposal with duly signed formats, in 1 original + ( ) copies as desired by you in your bid document for your consideration.

Dated the \_\_\_\_\_ day of \_\_\_\_\_ of 20

Thanking you,

We remain,

Yours faithfully,

(Signature, Name, Designation and Company's Seal)

Business Address:

Name and address of principal Officer.



Format 2 – Financial Bid - Premium quote

	Amount in figure	Amount in words
Premium to be paid to the NWRWS & K department (Rs. per unit of energy generated)		

Signature \_\_\_\_\_  
For \_\_\_\_\_

Bidder's Rubber Seal and Full Address.





**Format 3 : Details about Project cost (for information only, not to be used for evaluation)**

1. The format is to be filled for a new plant is being set up / plant already set up from where the power is proposed to be sourced.

No	Item	Indigenous component	Foreign component	Total cost in Rs.
0	Studies, investigations and preliminary works			
1	Cost of land			
2	Cost of Civil works			
3	Know-how engineering and consultancy			
4	Plant & Equipment* a. Mechanical equipment b. Electrical equipment c. Control instrumentation and Data Acquisition System d. Fuel transportation e. Miscellaneous tools and plants			
5	Project Management			
6	Commissioning expenditure			
7	Total EPC costs			
8	Contingency			
9	WC margin			
10	Interest during construction			
11	Financing charges#			
12	Other costs			
	<b>TOTAL</b>			

\* Bidder should furnish the cost of the imported equipments along with the cost of the present customs duty.

# Financing charges include commission fees, guarantees, commitment charges, underwriting fees etc.

The Bidder should also furnish the proposed financing structure i.e. debt: equity ratio, percentage of contribution from each consortium member, details of financing terms, any other related information.

Signature \_\_\_\_\_  
For

Bidder's Rubber Seal and Full Address



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## ANNEXURE 4

### Concession Agreement

Enclosed herewith is the Concession Agreement. The Concession Agreement has the terms and conditions under which the NWRWS&K department would grant the right to the concessionaire to implement the project.



# **Draft Model Concession Agreement**

**For**

**Small / Mini / Micro Hydro**

**Power Generation Projects**

**Gujarat Infrastructure Development Board**



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#### SCHEDULES

1. Specified Consents
2. Specifications and Standards
3. Project Completion and Construction Schedule
4. Lease Rental Schedule
5. Project Site map
6. Computation of Termination Amount



THIS AGREEMENT is made at \_\_\_\_\_ the \_\_\_\_\_ (date)

BETWEEN

- (1) \_\_\_\_\_, an undertaking of the Government of Gujarat duly incorporated under the Companies Act, 1956 whose registered office is situated at \_\_\_\_\_ (hereinafter referred to as the "Grantor" which expression shall include its successors and permitted assigns), of the ONE PART;

AND

- (2) \_\_\_\_\_, a company incorporated under the laws of India whose registered office is located at \_\_\_\_\_ (hereinafter referred to as the "Concessionaire" which expression shall include its successors and permitted assigns), of the SECOND PART.

WHEREAS

Recitals

- (A) The Government of Gujarat has promulgated the Policy for Small / Mini / Micro Hydel Projects in Gujarat on 10<sup>th</sup> January, 2005 in order to promote the development of small / mini / micro hydel power generation in the state;
- (B) The State Government has promulgated the Gujarat Infrastructure Development Act, 1999 (the "GID Act, 1999") to create the legal framework for private sector participation in infrastructure projects in the State;
- (C) Following the provisions of the GID Act, Grantor solicited pre-qualification bids for short-listing private sector participants by issuing advertisements in this regard in national and international media;
- (D) Pursuant to the short-listing procedures \_\_\_\_\_ parties were short-listed, and Request for Proposals ("RFP") were issued to them and \_\_\_\_\_ party submitted technical and financial bids.
- (E) After detailed evaluation of the bids of the party based on the technical and financial criteria specified in the RFP Messrs. \_\_\_\_\_ (the "Developer" or "Successful Bidder" or "Concessionaire") was selected for implementing the Project, and a Letter of Intent ("LOI") was issued for implementing the Project and the Developer since the date of issue of the LOI has adhered to all conditions and taken all necessary steps to discharge all its responsibilities under the LOI;
- (F) The Concessionaire and its Affiliates agrees to hold not less than 51 % of the paid up capital for the entire concession period.
- (G) Grantor has initiated steps for acquiring the land / already acquired the land for the Project and shall lease it to the Concessionaire;



(H) Grantor and the Concessionaire now desire to enter into this agreement (the "Concession Agreement" or "this Agreement") to grant the Concessionaire the right to design, finance, build, operate, over the time and in the manner spelt out in the Schedule - 2 of this agreement, and in accordance with such further agreements, ancillary agreements as may be entered into between the parties and transfer the Project and all residual rights therein to Grantor on completion of the Concession Period;

Now therefore, in consideration of the mutual agreements herein contained, and of other good and valuable consideration, the receipt of which are hereby acknowledged, the parties hereto agree as follows:



## 1. Definitions and Interpretation

### 1.1 Definitions

"Accounting Year" means the accounting year for preparation of the annual statutory accounts of the Concessionaire;

"Affiliates" mean member companies of the \_\_\_\_\_ Group or its employees and its Directors and Associates Investors.

"Arbitration Panel" shall mean the panel appointed under the provisions of Section 19.4;

"Asset Transfer Costs" shall mean the indirect taxes, duties, cess, and other charges payable by the Concessionaire on transfer of the assets to Grantor or an entity nominated by Grantor;

"Cause" means (with respect to the revocation of any Specified Consent;) direct violation (by Concessionaire) of Specific Consent which is documented and certified Independent Engineer that after receiving a formal notice from the Relevant Authority, Concessionaire has not reasonably tried to rectified such violation.

"Certificate of Compliance" shall mean the certificate issued under the provisions of Section 3.2.1 of this Agreement;

"Central Government" shall mean the Government of Republic of India;

"Concession" shall mean the Concession granted to the Concessionaire under the provisions of this Agreement;

"Concessionaire" shall mean \_\_\_\_\_ with its registered office at \_\_\_\_\_;

"Concessionaire Indemnified Loss" shall mean the loss incurred by Grantor to be indemnified by the Concessionaire under the provisions of Section 15.1;

"Concession Period" shall mean the period so defined in Section 2.0 of this Agreement;

"Conditions Precedent" shall mean the conditions so defined in Section 3.1 of this Agreement;

"Concessionaire Suspension Period" shall mean period of suspension of the Termination Notice given by the Concessionaire to Grantor under the provisions of Section 12.5(f);

"Construction Commencement Date" as specified in Schedule 3 of this agreement and shall not be later than 90 days from the date of issuance of certificate of compliance;

"Construction Contract(s)" shall mean the agreement(s) entered into between the Concessionaire and its Construction Contractor for the construction of the Project Facilities;





**"Construction Contractor(s)"** shall mean contractor(s) appointed by the Concessionaire to construct the Project facilities in accordance with the provisions of this Agreement and their sub-contractors and their successors and permitted assigns;

**"Consultation Panel"** for dispute resolution appointed under the provisions of Section 19.2 of this Agreement;

**"Contractual Liabilities"** those duties, liabilities and obligations arising under the agreements or other document comprising Project Agreements, which continue after the Termination Date;

**"Construction Agreement"** means the agreement(s) between the Concessionaire and its Construction Contractor(s) for the construction, commissioning and testing of the Project Facilities.

**"Contractors"** means the Direct Contractors and their direct sub-contractors and their successors and permitted assigns; [ ]

**"Date of Completion"** means the date on which the Final Completion Certificate is issued;

**"Direct Government Political Event"** shall mean those events defined under Section 11.1.2 (a);

**"Dispute Resolution Procedure"** shall mean the procedure for resolution of disputes provided under Section 19;

**"Delay Event"** means events as specified in Section 5.5.1;

**"Design Data"** shall mean all data, reports, methodologies, manuals, guides and other data related to design, engineering, construction, completion and operation and maintenance of the Project;

**"Detailed Project Report"** or **"DPR"** shall mean report carried out in pursuance of Section 4.1.3;

**"Development Security"** shall mean the security furnished in accordance with the provisions of Section 4.1.8 of this Agreement;

**"Direct Contractors"** means the Construction Contractor, Operation and Maintenance Contractor(s) and their respective successors and assigns;

**"Discriminatory Action"** shall mean an action so defined in Section 11.1.2(a)(ii);

**"Eligible Share Capital"** shall mean yearly average of the opening and closing balance of the paid up and subscribed equity share capital of the Concessionaire, other than the equity and preference share capital subscribed and paid from Grantor or the Government of Gujarat (if any);

**"Force Majeure Event"** shall mean event so defined under Section 11 of this Agreement;



**"Expiration Date"** shall mean the last date of Concession period on which this agreement terminates in accordance to the provisions of this Agreement, unless terminated earlier in accordance with this Agreement;

**"Final Inspection"** shall mean the inspection so conducted under Section 5.6.1 (e) of this Agreement;

**"Financial Bid"** shall mean the bid referred to in recital D of this Agreement

**"Final Completion"** shall mean the event of the issue of the Final Completion Certificate;

**"Final Completion Date"** shall mean the date on which the final completion certificate is issued under the provisions of this Agreement;

**"Final Completion Certificate"** shall mean the certificate issued under Section 5.6.1 (e) of this Agreement;

**"Financial Closure"** shall mean the coming into effect of the Financing Agreements with all the Lenders so that the Concessionaire has immediate access to the funds from the Lenders;

**"Financing Agreements"** means the agreements executed between the Concessionaire and the Lenders in respect of credit facilities made available by the Lenders to the Concessionaire for implementation of the Project;

**"Grantor Indemnified Loss"** shall mean the loss incurred by the Concessionaire to be indemnified by Grantor under the provisions of Section 15.2;

**"Grantor Suspension Period"** shall mean period of suspension of the Termination Notice so provided for under Section 12.5 (e);

**"Independent DPR Consultant"** shall mean a capable and competent to carry out the detailed project report of the Project, appointed in pursuance to Section 4.1.3 of this Agreement;

**"Independent Auditor"** shall mean the auditor or firm of auditors, permitted to carry out statutory audits under the law of India, appointed under the provisions of Section 5.8;

**"Independent Auditor's Agreement"** means the agreement entered into between [ ] and [ ] dated [ ].

**"Independent Engineer"** shall mean the engineer, or firm of engineers, appointed under the provisions of Section 5.8;

**"Independent Engineer's Agreement"** means the agreement entered into between Concessionaire and Independent Engineer dated [ ].

**"Infrastructure Act"** shall mean the Gujarat Infrastructure Development Act, 1999 and any subsequent amendment thereof;



"Investors" means the equity and preference shareholders in the Concessionaire, other than the Grantor and State Government;

"Land Lease Rental Payment Schedule" shall mean the schedule of discharge of the lease rental for the Project Site prescribed under Schedule 4 to this Agreement;

"Lease Rentals" means rentals so specified in the Land Lease Rental Payment Schedule and stated in Schedule 4 to this Agreement in accordance with the provisions of RFP;

"Lenders" shall mean financial institutions, banks funds, and agents or trustees of debenture holders, including their successors and assignees, who have agreed to guarantee or provide finance to the Concessionaire under any of the Financing Agreements for meeting the costs of all or any part of the Project and who hold priority security interest over the Project Site and Project Assets, the receivables, and the Project Agreements;

"Maintenance Period Insurance" shall mean the insurance cover to be taken by the Concessionaire under the provisions of Section 10.1(b);

"Material breach" means a breach by either party of any of its obligations in this agreement which has a Material adverse effect and which it fails to cure within the time available for that purpose in this agreement.

"Material Adverse Effect" means material adverse effect of any act or event on ability of either party to exercise its rights or perform any of its obligations, including but not limited to the physical or legal impossibility in regard to performance of such rights and obligations, under and in accordance with the provisions of this agreement other than as expressly authorized or permitted by this agreement.

"Natural Events" shall mean the events so defined under Section 11.1.1;

"Net Electrical Output" shall mean the total electricity generated, in units, delivered and measured at the interconnection point;

"Notice of Non-Compliance" shall mean the notice issued under Section 5.6.1(b);

"Other Consortium Members" means \_\_\_\_\_

"Political Events" shall mean the events so defined under Section 11.2;

"Preliminary Completion" shall mean the event of issue of the Preliminary Completion Certificate;

"Preliminary Completion Date" shall mean the date on which the Preliminary Completion Certificate is issued under Section 5.6.1(d);

"Preliminary Completion Notice" shall mean the notice so issued under Section 5.6.1(a);

"Preliminary Inspection" shall mean inspection carried as provided in Section 5.6.1(a);



**"Prime Lending Rate"** or PLR shall mean PLR declared by State Bank of India from time to time and valid as on the relevant Date;

**"Preliminary Termination Notice"** shall mean the termination notice issued under Section 12.5 (a) of this Agreement;

**"Project"** shall mean the design, engineering, financing, building and operating & maintaining the \_\_\_\_\_ Mw / kw Small / Mini / Micro Hydro project located at \_\_\_\_\_;

**"Project Agreements"** shall mean this Agreement, Financing Agreements, Security Agreements, Construction Contract, Operations and Maintenance Contracts, Energy Supply Agreements and such other agreements as may entered into between the Concessionaire, and the Grantor and other parties for the purpose of implementation of the Project;

**"Project Assets"** shall mean the assets so defined under Section 13.7.3 of this Agreement;

**"Project Completion Schedule"** shall mean the schedule of completion of each component of the Project Facilities specified in Schedule 3 to this Agreement;

**"Project Debt Serviced During Construction Period"** shall mean for the purposes of computation of the Termination Amount under Section 13.4 for Grantor Event of Default before the Preliminary Completion Date, the principal and interest paid during the period commencing from the Financial Close of the project till the Date of Preliminary Completion or Termination which ever is earlier;

**"Project Facilities"** shall mean the constructed infrastructure including turbine generator, evacuation facilities, buildings, amenities, utility services, so described in Schedule 2 of this Agreement and directly constructed and put in place by the Concessionaire during the subsistence of the Concession Period;

**"Project Liabilities"** shall mean the aggregate of the following sums expressed in Indian Rupees or in the currency of debt, as the case may be, outstanding and payable to Lenders under the Financing Agreements:

- (i) the principal amount of the debt provided by the Lenders under the Financing Agreements for financing the Project (the "principal") which is outstanding as on the Termination Date; and
- (ii) all accrued interest, financing fees and charges payable on or in respect of the debt referred to in sub-clause (i) above up to the date preceding the Termination Date but excluding any penal interest of charges payable to the Lenders.

**"Project Site"** means land, spaces, roads, and rights acquired or to be acquired by the Concessionaire through the Project Site Lease Agreement for the purpose of the construction of the Project Facilities through, above or below the ground on which or any part of which the Project Facilities are to be constructed (including without any limitation, any working areas required by the Concessionaire's contractors for the accommodation of its employees.



as described in the map attached in Schedule 5 to this Agreement and in the Project Site Lease Agreement);

"Project Site Lease Agreement" shall mean the lease agreement dated \_\_\_\_\_ between Grantor and the Concessionaire for the lease of the Project Site for the duration of the Concession Period;

"Relevant Authorities" shall mean the authorities indicated with respect to each specified consent in Schedule 1 to this Agreement;

"Request for Proposal" or "RFP" shall mean the document referred to in recital (D) of this Agreement;

"Scheduled Bank" shall mean a bank so defined under the Banking Regulations Act, 1949.

"Scheduled Date of Completion" with respect to each element of the Project Facilities shall mean the dates so specified in the Project Completion Schedule;

"Shareholders' Agreement" shall mean the agreement entered into between [Grantor] Concessionaire and other Shareholders with respect to matters governing their shareholding and management and operation of the Concessionaire and buy out of shareholdings in the event of a termination;

"Specified Consents" shall mean all such approvals, consents, authorisations, notifications, acknowledgements, agreements, permits, decisions or other matters referred to in Schedule 1;

"State Government (GoG)" shall mean the State Government of Gujarat;

"Statutory Entity" means any judicial or quasi-judicial authority, governmental agency or authority of the State Government or Central Government;

"Technical Bid" shall mean the bid referred to in recital (D) of this Agreement;

"Termination Amount" shall mean the amount computed in pursuance to Section 13 of this Agreement payable to the Concessionaire in event of Termination of this Agreement;

"Termination Date" shall mean the date of issue of the Termination Notice by Grantor/Concessionaire;

"Termination Rate of Return" shall mean Prime Lending Rate + \_\_\_\_\_ basis point per annum computed annually;

"Transfer Date" shall mean date on which the assets are agreed to be transferred to Grantor in accordance with the provisions of this Agreement, which date shall not be more than 30 days from the Termination Date;

"Vacant Possession" in relation to any part of the Project Site shall mean the right to and delivery of exclusive possession thereof on a leasehold basis subject to:



- (i) the existing rights of public passage to be shown on the drawings;
- (ii) the agreed or statutory rights of the Relevant Authorities to have access to the structures on or to be built upon the Site;

so that in respect of such rights no other person is in occupation, possession or use or has any claims to occupation, possession or use thereof;

## 1.2 Interpretation

In this Agreement:

- 1.2.1 Expressions defined in Section 1.1 shall bear the respective meanings set out therein;
- 1.2.2 The headings and paragraph numbering are for convenience only and shall be ignored in construing this Agreement;
- 1.2.3 The singular includes the plural and vice versa;
- 1.2.4 References to sections, recitals and schedules are, unless the context otherwise requires, references to sections of, and schedules and recitals to this Agreement, and
- 1.2.5 References to any agreement, enactment, ordinance or regulation includes any amendment thereof or any replacement in whole or in part.



## 2. Commencement and Duration

The period of the Concession ("Concession Period") shall commence on the day of execution of this Agreement and shall be for a period of thirty five (35) years. Upon completion of the Concession Period or it is terminated pursuant to the provisions of this Agreement all rights and obligations under this Agreement shall lapse.



### 3. Conditions Precedent

The rights and obligations in Articles 3, 12, 14, 15, 19 are binding on the parties from the date of this Agreement. The other rights and obligations under this Agreement are subject to the Conditions Precedent being satisfied or waived.

#### 3.1 Conditions precedents:

- 3.1.1 *The acquisition and lease to Concessionaire by Grantor of the project site ("Project Site") as described in Schedule 5 of this Agreement;*
- 3.1.2 The obtaining of the Clearances and approvals ("Specified Consents") as described in the Schedule 1 by the concessionaire;
- 3.1.3 Submission of DPR by the concessionaire prepared by a competent and qualified consultant ("DPR Consultant") in accordance with the provisions of the Schedule 2 within 4 months of signing of this agreement;
- 3.1.4 Review and approval of the DPR by Grantor, provided the same has been submitted by the concessionaire as per Section 3.1.3 and incorporation of the terms and conditions of the DPR in this agreement and such other agreement as may be necessary; and
- 3.1.5 Achievement of financial closure by the concessionaire.
- 3.1.6 The Independent Engineer and the Independent Auditor must have been appointed.

#### 3.2 Satisfaction of Conditions Precedent

- 3.2.1 Upon compliance in full of all conditions precedent set forth in Section 3.1 above the Concessionaire shall be obligated to issue to Grantor a Certificate of Compliance with Conditions Precedent (the "Certificate of Compliance"). The Concessionaire shall issue such Certificate within four (4) weeks of its determination that all conditions precedent set forth in Section 3.1 above have been complied with. In the event that the Concessionaire has not issued the Certificate of Compliance within four weeks Grantor can refer the matter to the Independent Engineer who shall then determine if the Certificate of Compliance can be issued or not. If the Independent Engineer is satisfied with documented evidence that a Certificate of Compliance can be issued it can issue the certificate to Grantor.
- 3.2.2 Concessionaire and Grantor shall make best efforts to ensure that all the Conditions Precedent mentioned in Section 3.1 above are satisfied within a period of six months from the date of execution of this agreement.
- 3.2.3 Notwithstanding anything contained in Section 3.1 to the contrary, any of the conditions precedent set forth in Section 3.1 above may be waived by an agreement in writing between Grantor and Concessionaire, provided, however, that the Concessionaire shall have been granted or obtained all Specified Consents that are





required to be obtained prior to commencement of the construction and; provided further that no such waiver shall be construed as a waiver by either party of any of its rights under this Agreement. Grantor may waive conditions set forth in 3.1.3, 3.1.4, 3.1.5 and 3.1.7. The concessionaire may waive the conditions set forth in 3.1.1. Both the parties can jointly waive the condition set forth in 3.1.6.

- 3.2.4 If the Conditions Precedent are not fully satisfied or waived within a period of six months from the date of execution of this Agreement Either Party shall be entitled to terminate, at its discretion, the agreement pursuant to the provisions of Section 13.2 of this Agreement.
- 3.2.5 The time limit, as set forth in Section 3.2.4, may be extended by either party, at its discretion, upon receiving such request by other party, in writing, for the reasons which are beyond the control of the requesting party or for such other genuine reasons or under any other provision of this agreement. However, such an extension shall not exceed six (6) month, under any circumstances except for the event of force majeure, where such an extension would be granted as per the provision of Section 11.4. If the condition precedents are not fully satisfied or waived even after such extension period is over, then either party shall terminate this agreement pursuant to the provisions of Section 13.2 of this agreement.



## 4. Project Development Stage

### 4.1 Obligations of the Concessionaire.

- 4.1.1 The concessionaire shall pay the project development expenses of Rs. \_\_\_\_\_ as specified in the RFP document, to the Grantor within 30 days of signing of this agreement. If the concessionaire fails to pay the project development expenses to Grantor within stipulated time, he same would be considered as material breach of the agreement and Grantor can forfeit the Bid / development security to recover the project development expenses. Grantor may also terminate the agreement.
- 4.1.2 The concessionaire shall develop the financing plan for the Project and carry out all necessary steps for Financial Closure, which shall be the sole responsibility of the Concessionaire;
- 4.1.3 The Concessionaire shall be responsible for carrying out a DPR for the Project by the Independent DPR Consultant to be appointed by the Concessionaire. The costs and fees payable to the Independent DPR Consultant for the DPR would be payable by the Concessionaire. The DPR would, on its approval and acceptance by Grantor (or by CEA, as per the Electricity Act, 2003), form the final technical specifications of the Project and would form an integral part of this agreement. The DPR shall be completed within a period of six months from the execution of this Agreement;
- 4.1.4 The Concessionaire hereby agrees that though Grantor may review the terms of such further agreements as the Construction Contract, the Financing Agreement, and Operations and Maintenance Agreement and other Agreements.
- 4.1.5 The Concessionaire shall make all applications (whether initial or renewal applications) for the Specified Consents referred to in Schedule 1 in the prescribed form and with the prescribed fee to the appropriate authorities ("Relevant Authorities") and shall diligently pursue all such applications with a view to obtaining the relevant Specified Consents as expeditiously as possible. The information supplied in the applications shall be complete and accurate so far as the Project, the Concessionaire, and other interested parties are concerned, and shall satisfy the substantive and procedural requirements of the applicable laws of the State Government and the Central Government and other Relevant Authorities.
- 4.1.6 The Governments/Relevant Authorities may attach such terms and conditions to the Specified Consents (each a "Consent") as are in accordance with the laws of India having due regard to the importance of the Project to the State of Gujarat and also India as a whole. The Concessionaire shall abide by such terms and conditions and shall use its reasonable endeavors to cause the Lenders and the Direct Contractors to abide by all such terms and conditions. Grantor shall as far as possible make best efforts to ensure that the State Government shall not attach to any Consent subsequent to its grant, any terms or conditions which materially and adversely affect

the rights of the Concessionaire, Lenders and Contractors or any of their obligations under the Financing Agreement.

- 4.1.7 If any Consent required under the Laws of the State of Gujarat or Central Government for Concessionaire, the Lenders or the Direct Contractors with respect to the Project lapse, or expires, or is terminated, the Concessionaire shall make or cause to be made a renewal application for that Consent and Sections 4.1.5, 4.1.6, and 4.2.7 shall mutatis mutandis apply thereto; provided that Grantor shall as far as possible make best efforts to ensure that Government shall not attach to the renewed Consent terms and conditions less favorable to the Concessionaire, the Lenders or the Contractors than those attached to the Consent which it replaces. Notwithstanding the foregoing, the Governments shall not be required to grant any renewal application, and Grantor shall not be obligated to ensure the granting/renewal thereof if the previous corresponding consent was revoked for a valid Cause.

#### 4.1.8 Development Security

The concessionaire is required to provide in favor of Grantor the Development Security of 5% of the project cost as specified in the DPR and certified by the Independent Auditor. The Development Security shall be provided in the form of an irrevocable bank guarantee. The development security shall be provided in two installments: The first installment of 25% of the development security shall be provided within 30 days from the signing of this Agreement, and the remaining amount (75% of the development security) shall be provided before 30 days of the Scheduled date of Construction Commencement. Till the date the first installment of the development security is provided, Grantor shall keep the bid security and upon submission of the development security (25%), Grantor shall release the bid security.

The appropriate amount of the Development Security shall be forfeited if the Concessionaire fails to construct the Project in accordance with the provisions of this Agreement or the LOI issued to the Developer, as the case may be.

Irrevocable guarantee to be provided for Development Security shall be from a scheduled bank or Insurance Company and honorable/payable in India through Scheduled Bank/Insurance Company. The format of irrevocable guarantee shall be within the format prescribed by the RFP.

Failure to provide and maintain the Development Security by the concessionaire as above shall be construed as a material breach of this Agreement by the Concessionaire.

Note : In case the DPR is not completed and available at the time of first installment, the project cost as submitted by the bidder in his RFP shall be taken into account. In such case, the amount of the development security shall be arrived at once the DPR is approved by the grantor. The variations in the amount of development security, if any, shall be taken care of at the time of receiving second installment by the Grantor.

#### 4.2 Obligations of Grantor/GoG



- 4.2.1 Grantor / GoG hereby grants the Concessionaire by way of lease of the Project Site, use of water to generate the power, the exclusive right to develop, design, finance, construct and complete, the Project in accordance with the Schedule 2 and operate and maintain the same, and transfer at the end of the Concession Period to Grantor the Project Assets in accordance with the terms and conditions of this Agreement for the duration of the Concession.
- 4.2.2 The concessionaire will have no right to claim release of water and the release of water shall be controlled by the Narmada and Water resources department / Sardar Sarovar Narmada Nigam Limited subject to the condition that irrigation / drinking water requirements / Industrial requirement for the water year (July to June) shall be fully met and available water could be put to optimum use for Hydro Power Generation. There is no guarantee regarding the minimum quantity / flow of water by Grantor.
- 4.2.3 Grantor shall grant at its own cost and expense, to the Concessionaire, Vacant Possession of the Project Site against payment of the lease rentals for the Project Site as per the agreed schedule ("Project Site Lease Rental Schedule").
- 4.2.4 Grantor shall lease to Concessionaire the Project Site under a valid and binding lease agreement (the "Project Site Lease Agreement"). The said Project Site Lease Agreement shall be duly executed and registered with the competent authorities. The lease rent of the land shall be as stated in Schedule 4 to this Agreement.
- 4.2.5 Grantor shall make best efforts to cause the State Government to grant, such permission or exemption, as may be required under the laws relating to and regulating land as applicable in the State of Gujarat so as to ensure that the Concessionaire can enjoy Vacant Possession and hold the area of land comprising the Project Site during the duration of the Concession.
- 4.2.6 Grantor shall cause the State Government to ensure that the Concessionaire is free to carry out the construction, operation and maintenance of the Project, in accordance with the provisions of this Agreement. The Concessionaire shall notify Grantor of impediments, legal or physical, which are not attributable to the Concessionaire or any of the sub-contractors employed by the Concessionaire, to the construction, financing and operation and maintenance of the Project and Grantor shall act so as to remove such impediments which are not attributable to the Concessionaire. If such impediments are not removed within a period of thirty (30) days from the date of such notice, it shall be condition of Delay under Section 5.5.1(b).
- 4.2.7 Grantor / GoG shall make best efforts to promote and support all such applications for the Specified Consents so as to expedite the consideration thereof by the Relevant Authorities and make best efforts for ensuring their approval by the Relevant Authorities.

## 5. Design, Engineering and Construction



## 5.1 Design Tests and Site Inspection

### 5.1.1 The Concessionaire shall be deemed to have:

- (a) inspected and examined the Project Site and its surroundings;
- (b) satisfied itself (so far as practicable and having taken into account any information in connection therewith which may have been provided by Grantor) as to the nature of the general conditions of the Project Site, the nature of the ground and subsoil, the form and nature of the Project Site, the risk of injury or damage to property affecting the Project Site, the nature of the materials (whether natural or otherwise) to be excavated and the nature of the design work and materials necessary for the execution of the works related to the development of the project; and
- (c) Satisfied itself as to the means of communication and access to and through the Project Site and accommodation it may require, the possibility of interference by persons (other than Grantor and other than persons claiming rights or title through, under or paramount to Grantor), with access to the Project Site after the Concessionaire shall have been given Vacant Possession with particular regard to the Relevant Authorities, and the precautions and times and methods of working necessary to prevent any nuisance or interference, whether public or private, being caused to any interested parties.

### 5.1.2 Responsibilities of Concessionaire

The Concessionaire shall be solely responsible for any deficiency in the design of the Project. The failure of Grantor to object to any design, design drawing or specifications or change thereto shall not be construed to be a waiver by Grantor of any of its rights under this Agreement or in any way relieve the Concessionaire of any of its obligations. In furtherance of the above, the Concessionaire:

- (a) accepts that no review conducted by or approval of Grantor with respect to the design of the Project Facilities will relieve the Concessionaire of any of its obligations under this Agreement, and that Grantor undertakes no responsibility as to the quality of engineering or construction of the Project Facilities or any component thereof;
- (b) shall in no way represent to any third party that, as result of any review by Grantor, Grantor is responsible for the engineering or construction soundness of the Project Facilities or any component thereof; and
- (c) shall be solely responsible for the technical feasibility, operational capability and reliability of the Project Facilities and each component thereof. The hydrological and other data provided by Grantor are based on its assessments and studies. The concessionaire shall make its own judgment about the technical feasibility of the project and conduct a survey if felt



necessary. Grantor will not be responsible for any mismatch of the data provided with actual data.

- (d) The Grantor shall provide the design data which are correct as per the information available with the Grantor.

## 5.2 Construction

Subject to the terms of this Agreement the Concessionaire shall design and construct the Project in accordance with the Prudent Utility Practices, relevant technical standards and specification and also in line with the provisions of Approved DPR, after obtaining all requisite approvals. The Company shall achieve Commercial Operation of the Project within Scheduled Commercial Operation Date and ensure that the Project is capable of being Dispatched delivering Active and Reactive Power and of being operated in parallel with the Grid System as per Prudent Utility Practices. The Concessionaire shall assume all costs and risks of the construction of the Project Facilities in accordance with this Agreement.

### 5.2.1 Detailed Responsibilities of the Concessionaire

- (a) Upon issuance of the Certificate of Compliance under Section 3.2.1 the Concessionaire shall commence the construction work on the Project Facilities on a date ("Date of Construction Commencement") within three months from the date of the Certificate of Compliance. The Project Completion Schedule defined in Schedule 3 shall be determined with reference to the Effective Date of this Agreement;
- (b) The Concessionaire hereby agrees not to grant any person access to the Project Site, except for the purpose of carrying out any construction, building or laying of any structures or utilities;
- (c) The concessionaire shall be responsible for performing the construction in accordance with:
  - (i) all applicable laws;
  - (ii) the detailed designs as per approved DPR;
  - (iii) all other requirements of this Agreement
- (d) The concessionaire should give priority to safety in its construction methods and activities in order to protect life, health and property and the environment.
- (e) The concessionaire should take all reasonable measures to minimise disruption and other inconvenience to the public and area residents and business during construction;



- (f) The concessionaire shall be responsible for applying for and obtaining in a timely manner and maintaining the approvals for the construction of the Project;
- (g) The Concessionaire shall be responsible for laying the power evacuation lines of appropriate voltage from the generation station to the nearest sub station of the State Transmission utility. In case, augmentation of a sub station is necessary the entire cost for the same shall be paid by the Concessionaire. Maintenance of the transmission line shall be carried out by the State Transmission Utility whenever required, at the cost of the Concessionaire or alternatively, the concessionaire shall carry out the maintenance on its own.
- (h) The Concessionaire shall enter into a separate agreement with the State Transmission Utility within a period of six (6) months from the Effective Date for execution, operation and maintenance of the Interconnection Facilities. The agreement shall inter-alia lay down the details of the Interconnection Facilities and also the charges and other terms and conditions for the execution, operation and maintenance of the Interconnection Facilities.
- (i) The Concessionaire shall provide at the Station, at its cost, suitable arrangements, compatible with the Grid System and as may be approved by the State Transmission Utility, for parallel operation with the Grid System as per Prudent Utility Practices and also for automatic isolation of the Project from the Grid System in the event of any fault on the Grid System and ensure that no damage is caused to the Project due to aforesaid.
- (j) For proper and prompt co-ordination and efficient load management, the concessionaire shall provide and maintain adequate and reliable communication system between the Power Station and \_\_\_kV sub-station of the State Transmission Utility at \_\_\_\_\_.
- (k) Construction Power: The Concessionaire shall make its own arrangements for meeting the power requirements of the Project during the construction period. Grantor may help the concessionaire in getting the construction power from the state owned Distribution Company operating in the area.

### 5.3 No Liability for Project Site risk

For the avoidance of doubt, notwithstanding the ground, physical and hydrological and geophysical investigations and such further design and testing as may be appropriate, the Concessionaire shall not be entitled to make any claim against Grantor whether in damages or for extension of time for completion in excess of three months (save in accordance with this Agreement) on the grounds of any misunderstanding or misapprehension in respect of the matters referred to Section 5.1 or on the grounds that



- (f) The concessionaire shall be responsible for applying for and obtaining in a timely manner and maintaining the approvals for the construction of the Project.
- (g) The Concessionaire shall be responsible for laying the power evacuation lines of appropriate voltage from the generation station to the nearest sub station of the State Transmission utility. In case, augmentation of a sub station is necessary the entire cost for the same shall be paid by the Concessionaire. Maintenance of the transmission line shall be carried out by the State Transmission Utility whenever required, at the cost of the Concessionaire or alternatively, the concessionaire shall carry out the maintenance on its own.
- (h) The Concessionaire shall enter into a separate agreement with the State Transmission Utility within a period of six (6) months from the Effective Date for execution, operation and maintenance of the Interconnection Facilities. The agreement shall inter-alia lay down the details of the Interconnection Facilities and also the charges and other terms and conditions for the execution, operation and maintenance of the Interconnection Facilities.
- (i) The Concessionaire shall provide at the Station, at its cost, suitable arrangements, compatible with the Grid System and as may be approved by the State Transmission Utility, for parallel operation with the Grid System as per Prudent Utility Practices and also for automatic isolation of the Project from the Grid System in the event of any fault on the Grid System and ensure that no damage is caused to the Project due to aforesaid.
- (j) For proper and prompt co-ordination and efficient load management, the concessionaire shall provide and maintain adequate and reliable communication system between the Power Station and \_\_\_\_ kV sub-station of the State Transmission Utility at \_\_\_\_.
- (k) Construction Power: The Concessionaire shall make its own arrangements for meeting the power requirements of the Project during the construction period. Grantor may help the concessionaire in getting the construction power from the state owned Distribution Company operating in the area.

### 5.3 No Liability for Project Site risk

For the avoidance of doubt, notwithstanding the ground, physical and hydrological and geophysical investigations and such further design and testing as may be appropriate, the Concessionaire shall not be entitled to make any claim against Grantor whether in damages or for extension of time for completion in excess of three months (save in accordance with this Agreement) on the grounds of any misunderstanding or misapprehension in respect of the matters referred to Section 5.1 or on the grounds that





incorrect or insufficient information relating thereto or the Project Site was given to it by any person, whether or not in the employment of Grantor.

#### 5.4 No Liability for Tender Data

Save as expressly provided in this Agreement, the Concessionaire shall not seek to recover from Grantor any losses or damages which may arise from the use or application by or on behalf of Concessionaire, or the Concessionaire, in the design and construction of the Project Facilities, of the data issued to it or its representatives in connection with the Project and/or Project Facilities by or on behalf of Grantor before or during the tender stages for the Project

#### 5.5 Extension of time for Completion of the works

##### 5.5.1 Delay Events shall mean the following:

- (a) Force Majeure Event pursuant to Sections 11 of this agreement;
- (b) Failure of the Grantor to grant Vacant Possession of the Project Site together with the ancillary easementary rights;
- (c) Any other breach by Grantor of its obligations under this Agreement;
- (d) Any delay caused by Grantor without due cause in commenting and approving the DPR;
- (e) Interruptions to the construction of the Project Facilities suffered due to intervention by the State Government or the Central Government or other statutory entity.

5.5.2 The Concessionaire shall give notice in writing to Grantor as soon as it can foresee a Delay Event occurring which will cause material delay to, or materially impede completion of the Project Facilities in time for the Scheduled Date of Completion, or, if the same is not foreseeable, as soon as it shall become aware of such Delay Event. Thereafter, but not later than 28 days after such notification, the Concessionaire shall give further written details to Grantor and the Independent Engineer which shall include:

- (a) a statement of which Delay Event the claim is based upon;
- (b) details of the circumstances from which the delay or impediment arises;
- (c) details of the contemporary records which the Concessionaire will maintain to substantiate its claims;
- (d) details of the consequences whether direct or indirect which such delay or impediment may have upon completion of the Project Facilities; and
- (e) details of any measures which the Concessionaire proposes to adopt to mitigate the consequences of delay or impediment.

5.5.3 Grantor and the Independent Engineer will, after receipt of written details under Section 5.5.2, be entitled by notice in writing to require the Concessionaire to provide such further supporting particulars as it may reasonably consider necessary.



- 5.5.4 Subject to the Concessionaire complying with Section 5.5.2 and subject to the Concessionaire putting forward proposals where required pursuant to Section 5.5.2(e) as to the reasonable steps which it intends to take in order to mitigate any delay, and provided the delay cause is material, Grantor shall, on recommendation of the Independent Engineer, as soon as reasonably practicable, grant to the Concessionaire in writing (either prospectively or retrospectively) such extension of the period or periods identified in the Project Completion Schedule to achieve the issue of Preliminary Certificate of Completion as the Independent Engineer considers necessary and shall fix a revised Scheduled Date for Completion. If Grantor on recommendation of the Independent Engineer declines to grant an extension of time as aforesaid or the Concessionaire considers that the extension is insufficient then the Concessionaire shall be entitled to refer the matter to the Dispute Resolution Procedure specified in Section 19.

## 5.6 Completion of Project Facilities and Synchronisation

### 5.6.1 Completion of Project Facilities

- a) The Concessionaire shall give Grantor not less than 30 (thirty) day's prior written notice (the "Preliminary Completion Notice") of the date on which the Concessionaire considers the Project will achieve Preliminary Completion as defined in the Schedule 3. On receiving the notice Grantor shall arrange an inspection of the Project Facilities by the Independent Engineer to confirm that the construction work has been completed and Project Facilities have been constructed and installed in accordance with this Agreement and relevant regulations ("Preliminary Inspection").
- b) Upon completion of the Preliminary Inspection Grantor, based on Independent Engineer's report, shall issue a written notice to the Concessionaire that the construction work is in accordance with this Agreement or advise the Concessionaire of any Non-compliance ("Notice of Non-Compliance"). If Grantor fails to issue a Notice of Non-Compliance within a period of 15 (fifteen) days of the Preliminary Inspection then it shall be deemed that the results of the preliminary inspection were satisfactory to Grantor.
- c) If the Project Facilities do not pass the Preliminary Inspection and if a Notice of Non-compliance is issued under Section 5.6.2 the Concessionaire shall take all necessary corrective action to remedy such non-compliance and then repeat the process of Preliminary Inspection. The Concessionaire shall be responsible for any increase in costs or delay resulting from such corrective action and for the costs incurred by the Parties in repeating the inspection.
- d) Upon expiry of the notice period following the delivery of the Preliminary Inspection Notice, provided the Independent Engineer is satisfied with the results of the Preliminary Inspection it shall issue a written notice to the Concessionaire that no further construction work is required. Grantor shall then issue a Preliminary Completion Certificate ("Preliminary Completion Certificate"). If Grantor does not issue the Preliminary Completion



Certificate or deliver a notice of Non-Compliance under Section 5.6.1(b) then the Preliminary Completion Certificate shall be deemed to have been issued on the day after the expiry of 20 (twenty days) from the expiry of the notice period for Preliminary Inspection.

- e) Within \_\_\_\_\_ months from the issue of the Preliminary Completion Certificate under Section 5.6.1 (d) the Independent Engineer shall conduct the Final Inspection ("Final Inspection") to confirm that the Project Facilities conform to the specifications and standards set out in this Agreement. Upon satisfactory completion of the Final Inspection by the Independent Engineer Grantor shall issue a certificate to the Concessionaire of Final Completion ("Certificate of Final Completion"). If the Project Facilities do not pass the Final Inspection then Grantor shall issue a Notice of Non-Compliance and the Concessionaire shall be responsible for remedying such non-compliance at his own cost. The procedure for Final Inspection shall be repeated thereafter. The Concessionaire shall be responsible for any increase in costs or delay resulting from such corrective action.
- f) The procedure for Preliminary Inspection and Final Inspection and provision for remedying the defects and deficiencies is without prejudice to the right of Grantor to levy liquidated damages for failure of the Concessionaire to complete the Project Facilities by the Scheduled Date of Completion under this Agreement or the rights of Grantor to claim of damages for breach of this Agreement by the Concessionaire or any claim under any warranty and guarantee issued by the Concessionaire.

#### 5.6.2 Synchronisation

- a) The concessionaire shall be responsible for availing Open Access permissions from the respective nodal agency to transmit the electricity using the existing transmission Network of the State Transmission utility or a transmission licensee operating in the area.
- b) The concessionaire shall be responsible for creating evacuation facilities up to the nearest Interconnection Point.
- c) The concessionaire shall enter into a Transmission agreement with the State Transmission utility or a transmission licensee. All the aspects related to transmission of energy i.e. synchronizations of the units, evacuation of power, wheeling charges etc. shall be governed by the said transmission agreement.

#### 5.7 Progress Reports

From the date of this Agreement until the issue of Certificate of Completion, the Concessionaire shall submit to Grantor a quarterly progress report in such form as may be agreed between the parties. Any change to the form of the quarterly progress report shall



be agreed with Grantor in the regular quarterly meetings to be held relating to such reports. After completion of the project quarterly operating reports shall be submitted to Grantor in a form as may be agreed.

#### 5.8 Independent Engineer and Independent Auditor

- 5.8.1 The Independent Engineer and Independent Auditor shall be appointed within six months from the date hereto pursuant to the Independent Engineer's Agreement and Independent Auditor's Agreement jointly by Grantor and the Concessionaire for the period required to complete the Project Facilities and for such further period during the Concession Period necessary under the provisions of this Agreement.
- 5.8.2 The costs and expenses relating to the work of the Independent Engineer and Independent Auditor shall be borne equally by the Concessionaire and Grantor.
- 5.8.3 Grantor and the concessionaire shall be entitled to consult with the Independent Engineer and Independent Auditor on any matter relating to the project.
- 5.8.4 The Independent Engineer and Independent Auditor shall report directly to Grantor. Neither party shall not be entitled to prohibit or hinder the delivery by the Independent Engineer or Independent Auditor of such reports and information to any party.

#### 5.9 Amendments to Independent Engineering Agreement

- 5.9.1 The Independent Engineers Agreement shall not be amended or departed from without the prior written consent of both the parties. Copies of proposed amendments and departures shall be submitted by the party suggesting the amendments to the other party not later than 28 days before it is intended to give effect to the same other than in the case of an emergency in which case the party shall deliver such copies as soon as reasonably practicable.
- 5.9.2 If any party shall have failed to raise objection to such an amendment or departure within 28 days of receipt of the relevant documentation (or such shorter period as may be specified in the event of emergency) then it shall be precluded from doing so.

#### 5.10 Liquidated Damages

- 5.10.1 If other than through the default of Grantor or the State Government or Central Government or any other statutory body, the Project and/or Project Facilities are not in a state that the Certificate of Completion in terms of this Agreement can be issued by the Independent Engineer by the Scheduled Date of Completion as defined in Schedule 3, then Grantor can, without prejudice to the continuing obligation of the Concessionaire to complete the Project Facilities, shall be entitled to payment by the Concessionaire of a liquidated damages. The amount of liquidated damages shall be equal to the daily amount of the payment of the



license fee per unit by the concessionaire to Grantor / GoG. The parties hereby agree that notwithstanding anything contained in this Agreement liquidated damages specified herein are a genuine estimate of the loss suffered by Grantor as a result of any delay in the completion of the construction of the Project.

5.10.2 For the purpose of calculation of liquidated damages, the Independent auditor shall use Installed Capacity as Name Plate capacity of the Plant as per DPR. Capacity Utilisation : \_\_\_\_\_ % and the license fees per unit as bided by the developer and as specified in Section 8.

#### 5.11 Release of the Development Security

After final completion date, the concessionaire shall make a request to Grantor for release of the development security along with the particulars thereof. Grantor shall release the Development Security within 30 days from the receipt of such request.



## 6 Sale of Power

- 6.1 The concessionaire can use the electricity generated from the power project for its own captive consumption. If the concessionaire does not want to use the electricity generated for captive consumption or he has excess capacity available, he can sale the electricity generated from the power project to Gujarat Electricity Board (GEB) or any / all of its successors. The sale of electricity and the tariff which can be charged shall be determined by Gujarat Electricity Regulatory Commission (GERC as per the power granted under the Electricity Act, 2003 and the Gujarat Electricity Industry (Reorganisation & Regulation) act 2003). Third party sale of electricity is not permitted by the state government as of now. The same shall be governed by the policy of Government of Gujarat from time to time.
- 6.2 The concessionaire shall also ensure delivery of power at the Interconnection Point in a safe and reliable manner so as to avoid fluctuations and disturbances to the Grid System due to parallel operation.
- 6.3 The concessionaire shall be responsible for taking any permissions/licenses from any of the authority in order to sale the power.
- 6.4 Concessionaire hereby agrees that, he will enter into long term supply agreement with any user only for the maximum period of the Concession Agreement less the construction period. The concessionaire shall not enter into any agreement for supply of electricity with any user to supply the electricity beyond the Concession Period.
- 6.5 The Grantor may provide assistance on best efforts basis to the concessionaire in order to seek any transmission facility from the state transmission utility.



## 7 Operation and Maintenance of the Project Facilities

7.1 Subject to the provisions of the Agreement, the Concessionaire shall operate and maintain, and if required, effect improvement (within the overall scope of the Project implementation) in the Project in accordance with:

- (i) Prudent Utility Practices;
- (ii) all applicable Laws and directives;
- (iii) the manuals, instructions and manufacturers' guidelines supplied by construction contractors, manufacturers of equipments/suppliers etc;
- (iv) the Grid Technical Limits;
- (v) Dispatch Instructions issued by State Load Dispatch Center; and
- (vi) rated capacity subject to normal derating/ deterioration.

### 7.2 Maintenance of Records

The concessionaire shall keep complete and accurate records and all other data required for the purposes of proper administration of the Agreement. Among other records and data required hereby or elsewhere in the Agreement, the concessionaire shall maintain an accurate and up-to-date operating log at the Project/Interconnection Point as per Prudent Utility Practices including records of:

- (a) Active and Reactive Power production for each hour at all times and the Energy generated/received on hourly basis;
- (b) Scheduled Outages, Maintenance Outages and Forced Outages;
- (c) Outage of the Generating Unit(s), other than the Scheduled Outage, Maintenance Outage and Forced Outage, but attributed to the following, or any one of the following:-
  - i) Grid System failure.
  - ii) Non availability of evacuation system beyond the Interconnection Point.
  - iii) Receipt of backing down instructions from the Control Centre.
- (d) Any unusual condition observed during operation/ inspection(s).

All such records shall be maintained for a minimum of sixty (60) months after the creation of such record or data. Grantor / GoG / or any other Government Agency shall have the right, upon reasonable prior notice to the concessionaire, and at reasonable times, to examine such records and data maintained by the Concessionaire.

### 7.3 Failure to Maintain



- 7.3.1 If in the opinion of the Independent Engineer the Concessionaire is in breach of its obligations to maintain the Project Facilities in accordance with the provisions of this agreement, Grantor may give notice of the breach to the Concessionaire. On receipt of such notice, the Concessionaire shall perform the necessary corrective action and remedy the breach within a period to be specified by the Independent Engineer.
- 7.3.2 If the failure of the Concessionaire to maintain is such that it is violation of the minimum stipulated provisions of the obligations of the Concessionaire, and the Concessionaire has not remedied the breach within a period so specified under Section 7.3.1 above Grantor shall treat the breach as a material breach under this Agreement and shall be entitled to terminate this Agreement.





## 8 License fees and Lease rental.

### 8.1 License Fees

- 8.1.1 The concessionaire shall pay to Grantor the license fees as per his Financial Bid. Accordingly, the concessionaire shall pay to the Grantor an amount equal to Rs. \_\_\_\_\_ per unit of the electricity generated and transmitted to the interconnection point.
- 8.1.2 The license fee is payable at the end of each quarter for the Net Electrical output generated during that quarter. The license fee payment due to Grantor / GoG shall be computed every three months by the Independent Auditor and payable to Grantor / GoG within a period of 30 (thirty) days of the final determination thereof. Any delay in payment of the Royalty to Grantor / GoG by the Concessionaire shall, beyond the period of 30 days, attract interest at the rate of Prime Lending Rate + 5% per annum.
- 8.1.3 The Concessionaire shall be responsible for installing the Metering System, its inspection and testing, and recording the Net Electrical Output generated by the Power Station and delivered at the Interconnection Point.
- 8.1.4 The concessionaire shall supply the details of daily units generated and supplied at the Interconnection points to the Independent auditors. The independent auditors shall certify the information which shall be used for calculating the license fee.

### 8.2 Lease Rental for Land

The Concessionaire shall be required to pay the Grantor the lease charges for the land as per Schedule 4 to this Agreement. The premium and monthly lease rental shall be discharged in accordance with the provisions of the Lease Agreement for the Project Site between Grantor and the Concessionaire. The lease rental shall be payable quarterly along with the payment of the License fees.

### 8.3 Escrow Account

The Concessionaire shall create an escrow account to be managed by a Scheduled Bank where certain percentage of the monthly cash inflows of the Concessionaire shall be deposited. The amount so deposited in the escrow account shall be sufficient to cover the quarterly payment to Grantor for the license fees and lease rental. The Independent Auditor shall certify that amount deposited in the escrow account is sufficient to recover the quarterly payments. The amount accumulated in the escrow account for a period of three months shall be utilised towards discharging the liability of the Concessionaire towards Grantor / GoG for the license fee payment and lease rental payment.

### 8.4 Penalty for late payment



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If the concessionaire fail to make the payment for the aforementioned items, within the time period specified, the concessionaire shall be liable to pay the Grantor penalty at the rate of Prime Lending Rate + 5 % as penal interest rate for the period of delay.



## 9 Representations and Warranties

### 9.1 Representations and Warranties of each Party to the Other

Each Party hereby represents and warrants to the other Parties that:

- (a) it is duly constituted, validly existing and in good standing under the laws of the jurisdiction of its incorporation;
- (b) it has full powers and authority to execute, deliver and perform its obligations under this Agreement and to carry out the transactions contemplated hereby;
- (c) it has taken all necessary action to authorise the execution, delivery and performance of this Agreement; and
- (d) this Agreement constitutes the legal, valid and binding obligation of it, enforceable against it in accordance with the terms hereof.

### 9.2 Specific Representations and Warranties of Grantor

Grantor further represents that:

- (a) the land acquisition proceedings in respect of the Project Site shall be complete and final as per the applicable statutes (excluding remedy of the affected persons to go to the court for challenging the quantum of compensation alone i.e. with regard to vesting of property in the government and the title on the same i.e. unassailable) and that the Concessionaire shall have vacant possession of the Project as on the Construction Commencement Date;
- (b) there is no litigation, claim, demand or any proceeding pending before any authority in respect of the title of the land constituting the Project Site subject to Section 9.2 (a);
- (c) it has the necessary permissions and authority from the State Government for granting the Concessionaire the necessary permits and clearances.

### 9.3 The Concessionaire further warrants that it would take all steps to ensure that it is fit and capable of design, engineering, financing, construction and marketing of the project.



## 10 Insurance

10.1 The Concessionaire shall maintain or cause to be maintained all necessary insurance covers required to be maintained as specified hereunder:

a) Construction Insurance

The Concessionaire shall effect and maintain, or cause to be effected and maintained, at no cost to Grantor during the Construction Period such insurances upto such maximum sums as may be required under and in accordance with the Financing Documents, Applicable Laws and such insurance as the Concessionaire may reasonably consider necessary or desirable in accordance with Good Industry Practice. The Concessionaire shall also effect and maintain such insurance as may be necessary for mitigating the risks that may devolve on Grantor as a consequence of any act of omission by the Concessionaire during the Construction Period. The concessionaire shall take all the requisite insurances prior to Construction Commencement, and supply such evidence of compliance as may be required by Grantor.

b) Operation, Maintenance Insurance

Not later than 4 (four) months prior to the anticipated Completion of the Project, the Concessionaire shall obtain and maintain at no cost to Grantor during the Operations Period in respect of the Project and its operations such insurance as may be required under any of the Financing Documents, Applicable Laws and such insurance as the Concessionaire may reasonably consider necessary or desirable in accordance with Good Industry Practice.

10.2 The Concessionaire shall also procure or caused to be procured insurance of the Project Facilities during the subsistence of the Concession Period.

10.3 The cost and expenses of insurance shall be borne by the Concessionaire.

10.4 If the Concessionaire fails to obtain the specified insurance covers, concessionaire shall be responsible for any liabilities arising from non-compliance and Grantor / GoG shall not be responsible for any liability arising from such negligence of concessionaire.

10.5 The Concessionaire shall ensure that it applies the insurance proceeds it receives for reinstatement or repair of the physical damages suffered by the Project Facilities.



## 11 Force Majeure Events

### 11.1 Meaning of Force Majeure Event

In this Agreement, "*Force Majeure Event*" means any event or circumstance or any combination of events or circumstances beyond the reasonable control of either party which, or any effect of which, (a) materially and adversely affects the performance by that party of its obligations or the enjoyment by that party of its rights under or pursuant to this Agreement or (b) causes that party to incur a material additional or increased cost (including debt service) or a material reduction in, or deferral of, its income; Provided, that the same has not occurred due to the failure of the Concessionaire to develop, design, finance, insure, construct, complete and operate and maintain the Project Facilities to such standards and specifications and following prudent practices or due to failure of Grantor to carry out its obligations under this agreement.

Without limitation to the generality of the foregoing, "*Force Majeure Event*" shall include the following events and circumstances and their effects to the extent that they, or their effects, satisfy the above requirements:

#### 11.1.1 Natural events ("*Natural Events*") to the extent they satisfy the foregoing requirements including, but not limited to:

- (a) any material effect on the natural elements, including lightning, fire, earthquake, cyclone, flood, storm, tornado, or typhoon;
- (b) explosion or chemical contamination (other than resulting from an act of war);
- (c) epidemic or plague; and
- (d) any event or circumstance of a nature analogous to any of the foregoing.

#### 11.1.2 Other Force Majeure Events ("*Political Events*") to the extent that they satisfy the foregoing requirements including, but not limited to:-

- (a) Political Events which involve directly the State Government and the Central Government ("*Direct Government Political Event*"), including, but not limited to:
  - (i) The expropriation, nationalisation or compulsory acquisition by the State Government or Central Government or any political agency or subdivision thereof in Gujarat or India of any material assets or rights of the Concessionaire;
  - (ii) Any Discriminatory Action by the State Government



A Discriminatory Action shall occur if:

The State Government or Other Statutory Entity takes action of any nature whatsoever after the date hereof, including the introduction or application of any law, decree or regulation, or fails to carry out its obligations as prescribed by law, the principal effect of which is directly or indirectly borne by the Concessionaire and only incidentally by other persons and, such action materially or adversely affects the economic position of the Concessionaire, except where such action or omission is in response to any act or omission on the part of the Concessionaire which is illegal (other than an act or omission rendered illegal by virtue of Discriminatory Action of the State Government), or in violation of agreements in which the Concessionaire is a party; and.

(iii) Change in law other than those specified in Section 18;

(iv) Any event or circumstance of a nature analogous to any of the foregoing.

(b) Political Events which occur inside the State of Gujarat and the Republic of India or involve the State Government and/or the Central Government ("*Indirect Political Events*") including, but not limited to:

(i) Act of war (whether declared or un-declared), invasion, armed conflict or act of foreign enemy, blockade, embargo, revolution, riot, insurrection, civil commotion, or act of terrorism;

(ii) Radioactive contamination

(iii) Strikes, work to rule, go-slows

(iv) Any event or circumstance of a nature analogous to any of the foregoing

11.1.3 Force Majeure Events shall expressly not include the following conditions, except to the extent resulting from a Force Majeure Event:

(a) Late delivery of plant, machinery, construction equipment, raw materials, spare parts, or consumables; or

(b) A delay or default by any party to any agreement or other document comprising the Financing Agreement, other than the Concessionaire, Grantor, the State Government or Central Government or any other Statutory Entity, in the performance of the obligations there under.



## 11.2 Notification of Obligations

11.2.1 A party affected by the Force Majeure Event shall give notice to the other party of such Force Majeure Event as soon as reasonably practicable, but not later than fifteen (15) working days after (i) the commencement of the Force Majeure Event causing loss or damage to the Project, or (ii) the date on which such party knew or should reasonably have known of the commencement of an Force Majeure Event which causes loss of or damage to the Project; Provided that, notwithstanding the above, if the Force Majeure Event results in a break-down of communications rendering it not reasonably practicable to give notice within the applicable time limit specified therein, then such party shall give such notice as soon as reasonably practicable after the reinstatement of communications, but not later than three (3) working day after the reinstatement of communications.

11.2.2 The party affected by the Force Majeure Event shall give notice to the other party of (i) the cessation of the relevant Force Majeure Event, and (ii) the cessation of the effects of such Force Majeure Event on the enjoyment by such party of its rights or the performance by it of its obligations under this Agreement as soon as practicable after becoming aware of each of (i) and (ii) above, but, in each case (subject, *mutatis mutandis*, to the proviso the Section 11.2.1), within seven (7) working days after becoming so aware.

11.2.3 Neither party shall be excused pursuant to Section 11.4 for any failure or delay in complying with its obligations under or pursuant to this Agreement until the notice mentioned in Section 11.2.1 shall have been given to the other party; Provided that, if the said notice shall have been given within the period mentioned in Section 11.2.1 the party affected by the Force Majeure Event shall be excused for such failure or delay pursuant to Section 11.4 from the commencement of the relevant Force Majeure Event.

## 11.3 Mitigation and Reports

The party affected by the Force Majeure Event shall use its reasonable endeavors to mitigate the effects of any Force Majeure Event affecting the enjoyment by such party of its rights or the performance by it of its obligations under this Agreement. The affected party shall furnish weekly written reports to the other party with respect to its progress in overcoming the effects of the event or circumstance of a Force Majeure Event together with such supporting and information.

## 11.4 Delay caused by Force Majeure Events

11.4.1 Subject as provided in Section 11.2.3 neither party shall be liable for any failure or delay in complying with any of its obligations (other than an obligation to make any payment) under or pursuant to this Agreement to the extent that such a failure or delay has been caused, or contributed to, by one or more Force Majeure Events or its or their effects or by combination thereof.



11.4.2 Where Section 11.4.1 applies, the periods allowed for the performance by the relevant party of the obligations(s) referred to in Section 11.4.1, the Project Completion Schedule shall, subject to Section 11.3, be extended day-for-day for so long as one or more Force Majeure Events or its or their effects continues either (a) to affect materially and adversely the performance by such party of such obligation(s) under or pursuant to this Agreement or (b) to cause that party to incur a material additional or increased cost (including debt service) or a material reduction in or deferral of its income.

11.4.3 Notwithstanding the provisions of Section 11.4.1 and 11.4.2 no relief shall be granted to either party pursuant to this Section 11.4 to the extent that such failure or delay would have nevertheless been experienced by such party had such Force Majeure Event or its effect not occurred.

11.4.4 Other than the obligations mentioned in Section 11.5 and 11.6 or for payment under Section 22, Grantor shall not bear any liability for any loss or expense suffered by the Concessionaire as a result of a Force Majeure Event or its effects. Other than the obligations mentioned in Section 11.5 and without prejudice to Grantor's remedies under Section 13, Concessionaire shall not bear any liability for any loss or expense suffered by Grantor as a result of an Force Majeure Event or its effects.

#### 11.5 Termination as a result of Force Majeure Event

In case an Force Majeure Event subsists for a period of 180 (one hundred eighty days or more within a continuous period of 365 (three hundred sixty five) days and affects a party the other party shall instruct the Independent Engineer to submit its report on the cost of the event, technical and financial viability of restoring the Project Facilities. If in the case of any Force Majeure Event the Independent Engineer determines that the restoration of the Project Facilities is not technically or financially viable, this Agreement shall thereupon terminate and relevant provisions of Section 13 shall thereupon apply.

#### 11.6 Dispute Resolution

In the event that the parties are unable to agree in good faith about the occurrence or existence of a Force Majeure Event, such dispute shall be finally settled in accordance with the Dispute Resolution Procedure, provided, however, that the burden of proof as to the occurrence or existence of such Force Majeure Event shall be upon the Party claiming relief and/or excuse on account of such Force Majeure Event.





## 12 Termination

### 12.1 Termination due to non-fulfillment of Conditions Precedent

- a) The Concessionaire shall use their reasonable endeavors to procure the fulfillment of the conditions set out in Section 3.1.2 and 3.1.6 on or before the date falling Six (6) months after the signing of this Agreement; provided that the parties may extend this date by mutual agreement up to further maximum period of six months. Party may terminate this Agreement by giving notice of such termination to the other party of, notwithstanding that the parties hereto have used their reasonable endeavors as aforesaid, such conditions are not fulfilled by the said date. Upon the giving of notice of termination under this paragraph, this Agreement shall immediately terminate.
- b) The Concessionaire shall use their reasonable endeavors to procure the fulfillment of the conditions set out in Section 3.1.3 and 3.1.5 on or before the date falling Six (6) months after the signing of this Agreement; provided that the parties may extend this date by mutual agreement up to further maximum period of six months. Grantor may terminate this Agreement by giving notice of such termination to the Concessionaire of, notwithstanding that the parties hereto have used their reasonable endeavors as aforesaid, such conditions are not fulfilled by the said date. Upon the giving of notice of termination under this paragraph, this Agreement shall immediately terminate.
- c) Grantor shall use their reasonable endeavors to procure the fulfillment of the conditions set out in Section 3.1.1 and Section 3.1.4 on or before the date falling Six (6) months after the signing of this Agreement; provided that the parties may extend this date by mutual agreement up to further maximum period of six months. Concessionaire may terminate this Agreement by giving notice of such termination to the Grantor of, notwithstanding that the parties hereto have used their reasonable endeavors as aforesaid, such conditions are not fulfilled by the said date. Upon the giving of notice of termination under this paragraph, this Agreement shall immediately terminate.
- d) If this Agreement is terminated by virtue of the non-fulfillment of the condition precedent set out in Section 3.1.2 and 3.1.6 neither party shall have any liability to the other under this Agreement or otherwise by virtue thereof.

### 12.2 Termination on Expiration Date

The expiration date of this Agreement shall be the last date of the Concession Period ("Expiration Date"). This agreement shall terminate on the Expiration Date.



## 12.3 Termination by Grantor:

Grantor may give the Concessionaire a notice of intended termination of this agreement upon the occurrence of the following events (each such event a "*Concessionaire Event of Default*") unless resulting from a Force Majeure Event, a breach by Grantor of this agreement, a Grantor event of default, there under:

- (a) the failure of the Concessionaire to achieve (i) the Preliminary Completion Date for the Project within three months after the date originally specified in the program appearing as the Project Completion Schedule in Schedule 3 to this Agreement (ii) the successful operation of the Project within one month after the date originally specified in the above program (iii) the substantial completion of restoration works required to be carried out following the occurrence of an Force Majeure Event by the date beyond which it is agreed between the parties or determined by the Independent Engineer that Grantor shall be entitled to terminate this agreement pursuant to this Section (unless there shall have been a supervening Force Majeure Event);
- (b) after the commencement of construction of the Project Facilities as certified by the Independent Engineer the abandonment by the Concessionaire of the construction of the Project for more than Ninety (90) days as certified by the Independent Engineer without the written consent of Grantor; Provided the Concessionaire shall not be deemed to have abandoned the construction of the Project if it gives written notice stating in reasonable detail the facts for the satisfaction and approval of the Independent Engineer and Grantor and takes appropriate measures that it needs to take to proceed with construction of the Project and continues to take such measures until such measures are no longer required;
- (a) if the Project Facilities are designed, constructed or completed (i) in a manner that materially deviates from the Schedule 2 or DPR, or (ii) in material violation of any applicable law or (iii) the Concessionaire does not explain the reasonable and appropriate measures that it intends to take to cure any such material violation or deviation and does not begin and thereafter continue to take such measures until such measures are no longer required;
- (b) if the Concessionaire willfully or recklessly fails in a material respect to operate and maintain the Project Facilities during the Concession Period following prudent practices and to the satisfaction of the Independent Engineer within 21 days of the Independent Engineer serving notice stating in reasonable detail the facts that forms the basis of this assertion and the Concessionaire fails to explain the reasonable and appropriate measures that it intends to take to cure such material failure and does not begin and thereafter continue to take such measures until such measures are no longer required;
- (c) the transfer, pursuant to any law, of either (i) the rights and/or obligations of the Concessionaire hereunder, or (ii) all or a substantial portion of the undertaking of the Concessionaire, except where such transferee is approved by Grantor in

accordance with this Agreement and such transfer does not affect the ability of the transferee to perform its obligations under this Agreement and provided such transferee expressly assumes such obligation;

- (d) the Concessionaire shall assign or purport to assign, directly or indirectly, its rights and its obligations under this Agreement or transfer its assets without the prior written consent of Grantor in accordance with this Agreement;
- (e) the Concessionaire repudiates this Agreement or evidences in any manner its intention not to perform under, or to be bound by this Agreement;
- (f) the Developer and/or its Affiliates shall cease to own directly or indirectly at least 51% of the subscribed and paid up capital of the Concessionaire;
- (j) After the Completion Date as defined in this Agreement, the shareholders' funds of the Concessionaire are less than the amounts so specified in the Shareholders Agreement as stated below:
  - i. during the construction period, 51 per cent of the total equity funds by the Concessionaire are in place;
  - ii. after the Final Completion Date the concessionaire and the consortium must held 51% of the equity of the project, out of which the developer must held the majority of the stake (within the consortium) at any point of time during the concession period.
- (k) except for the purpose of any compromise or arrangement or amalgamation or reconstruction (provided, that such amalgamation or reconstruction does not affect the ability of the amalgamated or reconstructed entity, as the case may be, to perform its obligations under this agreement and in any event the terms of such compromise or arrangement or amalgamation or reconstruction as the case may be are approved by Grantor in writing), the occurrence of any of the following events: (i) the passing of a resolution by the shareholders, creditors of the Concessionaire for the winding up of the Concessionaire (ii) the appointment of a liquidator in a proceeding for the winding up of the company and due hearing, which appointment has not been set aside or stayed within ninety (90) days of such appointment; or (iii) the making by the Court of an order winding up of the Concessionaire.
- (l) any material breach by the Concessionaire of this Agreement, such as would entitle Grantor to treat such agreement as having been repudiated by the Concessionaire in accordance with the provisions of Section 12.5 (e) of notice from Grantor stating that a material breach of the agreement has occurred..

Grantor shall deliver to the lenders' representative a copy of any notice given under this Section 12.3 on the same date that it delivers that notice to the Concessionaire.



#### 12.4 Termination by Concessionaire

The Concessionaire may give to Grantor a notice of intended termination of this agreement upon the occurrence of any of the following events (each a "*Grantor Event of Default*") unless resulting from a Force Majeure Event, a breach by the Concessionaire of this Agreement.

Any fundamental breach or default by Grantor of this Agreement such as would entitle the Concessionaire to treat this Agreement as having then been repudiated by Grantor, which is not remedied within ninety (90) days of notice from the Concessionaire to Grantor identifying the fundamental breach or default in question in reasonable detail and demanding remedy thereof,

#### 12.5 Termination Notices

- a) A notice of termination given pursuant to Section 12.3 or 12.4 (each a "Preliminary Termination Notice") shall specify in reasonable detail the Concessionaire Event of Default or Grantor Event of Default, as the case may be, giving rise to the Preliminary Termination Notice.
- b) Following the giving of a Preliminary Termination Notice, the parties shall consult for a period of up to three (3) months (or such longer period as they may agree) as to what steps shall be taken with a view to mitigating the consequences of the relevant event having regard to all the circumstances.
- c) At the expiration of the said period and unless the parties shall have otherwise agreed or the event giving rise to the Preliminary Termination Notice shall have been remedied, the party having given the Preliminary Termination Notice may terminate this agreement by giving written notice (a "Termination Notice") to the other party and to the Lenders' representative or trustee whereupon, subject to paragraph (d) below, this Agreement shall terminate and Section 13 shall apply.
- d) Substitution of Nominated Company
  - i) Upon the giving of a Preliminary Termination Notice by Grantor pursuant to Section 12.3, the lenders shall be entitled to substitute another Concessionaire ("Nominated Party") for the Concessionaire under this Agreement in accordance with the following provisions of this Section.
  - ii) Subject to clause (vi) below, within forty five (45) days after the date on which Grantor gives a Preliminary Termination Notice, a substitution notice ("Substitution Notice") may be given to Grantor by and on behalf of the Lenders holding in excess of fifty (50) per cent of the then outstanding amount under the Financing Agreements. The Substitution Notice shall indicate the Party which is proposed to continue this Agreement in place of the Concessionaire.
  - iii) Upon receipt by Grantor of a Substitution Notice, Grantor and the relevant Lenders shall consult for a period of twenty-one (21) days as to the entity



which is to be the Nominated Party. On or before the expiration of that consultation period, Grantor shall have the right to reject the entity proposed in the Substitution Notice if it is not reasonably satisfied that such entity has the financial and technical capability to continue the construction and/or operation of the Project or if Grantor determines, in its sole discretion, that the substitution of the Concessionaire would prejudice the public interest of the State of Gujarat and/or Government of India. If Grantor shall so reject the company proposed in the Substitution Notice, Grantor and the relevant Lenders shall continue to consult for further twenty-one (21) days as to an alternative party to be the Nominated Party subject to Grantor's right to reject such alternative entity for the reasons specified in the previous sentence.

- iv) At the end of the periods specified in subclause (iii) above, (unless Grantor shall have rejected all parties proposed by the Lenders), (a) Grantor and the Nominated Party shall forthwith execute a novation of this Agreement. (b) Grantor shall procure the execution of novations, *mutatis mutandis*, in substantially the same form, in favor of the Nominated Party of the relevant and applicable Project Agreements, provided no such novations shall be executed or take effect unless the Nominated Party shall have at the same time entered into novations of such agreements and entered into such other agreements and documents as are required by the Lenders.
- v) At the end of the period(s) specified in sub-clause (iii), if Grantor shall have, in accordance with sub-clause (iii) rejected all companies proposed by the relevant Lenders, unless Grantor and the relevant Lenders otherwise agree, this Agreement shall terminate in accordance with Section 12 as if no Substitution Notice has been given.
- vi) No Substitution Notice may be given, and accordingly no further substitution may take place under this sub section unless the parties otherwise agree, if there shall previously have been three (3) or more Nominated Companies with which Grantor has entered into novation pursuant to sub clause (iv).
- e) A Preliminary Termination Notice given to the Concessionaire in accordance with paragraph (a) above shall be suspended for a period of 3 (three) months from the Termination Notice (the "Grantor Suspension Period"); provided that the Suspension Period shall immediately terminate, upon notice from Grantor to the Concessionaire and the Lenders fail to use their reasonable endeavors to remedy the relevant Concessionaire Event of Default or to return the Project to such physical and operational condition as Grantor may reasonably require. During the Grantor Suspension Period, the Lenders shall be entitled either to remedy the relevant Concessionaire Event of Default to Grantor's reasonable satisfaction or, at the Lenders' option, to return the Project to such physical and operational condition as Grantor may reasonably require. If the Concessionaire Event of Default is so remedied or the Lenders return the Project to such physical and operational condition as Grantor may reasonably require, this Agreement shall continue after the Grantor Suspension Period as if no Preliminary Termination Notice had been given.



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- f) A Preliminary Termination Notice given to Grantor in accordance with (a) above shall remain suspended for 3 (three) months from the Termination Notice ("Concessionaire Suspension Period"); During the Concessionaire Suspension Period the Grantor shall be entitled to remedy the relevant Grantor Event of Default to the Concessionaire's reasonable satisfaction. If the Grantor Event of Default is so remedied this Agreement shall continue after the Concessionaire Suspension Period as if no Preliminary Termination Notice had been given.

### 13 Consequences of Termination

#### 13.1 Termination of project due to expiry of concession period

If this agreement terminates pursuant to Sections 12.2:

- a) No Termination Amount shall be payable to the Concessionaire by Grantor;
- b) The Concessionaire shall transfer the Project Assets as defined in Section 13.2 to Grantor at the Depreciated Historical Cost (DHC) of the project.
- c) Grantor shall have no obligation to assume or discharge the Project Liabilities or the Contractual Liabilities which are due prior to the expiration date.

#### 13.2 Termination due to non-fulfillment of condition precedents.

- a) If the agreement is terminated pursuant to Section 12.1(a), no part shall any liability of any payments. Grantor shall return the development security / bid security to the concessionaire.
- b) If the agreement is terminated pursuant to Section 12.1(b), Grantor shall forfeit the development security / bid security. Also the concessionaire shall be liable to reimburse Grantor, the actual development expenses incurred by Grantor, till the date of termination, as certified by Independent Auditor ;
- c) If the agreement is terminated pursuant to Section 12.1(c), Grantor shall reimburse to the concessionaire the actual cost incurred by the concessionaire till the date of termination of this agreement. The concessionaire must provide all the documentary evidence to show that he has actually incurred the cost. Also the Independent Auditor shall certify the cost. Grantor shall also return to the concessionaire the development security / bid security.

#### 13.3 Termination for Concessionaire Event of Default:

If this Agreement terminates pursuant to Section 12.3:

- a) No Termination Amount shall be payable to the Concessionaire by Grantor;
- b) The Concessionaire shall transfer the Project Assets to Grantor or to its designee within thirty (30) days after the Termination Date;
- c) Grantor shall assume and discharge the Project Liabilities and the Contractual Liabilities;



This is without prejudice to the right of Grantor to claim damages for breach of this Agreement by the Concessionaire.

13.4 Termination by Concessionaire for Grantor Event of Default or Direct Political Events:

If this Agreement terminates pursuant to Section 11.1.2 (a) or 12.4, on the Transfer Date:

If the termination is after Commencement of Construction but before Preliminary Completion of Construction:

- a) Grantor shall pay to the Concessionaire an amount equal to the subscribed and paid up Share Capital subscribed of the Concessionaire ("Eligible Share Capital") and an allowed Termination Equity Rate of Return ("Termination Equity Rate of Return") per annum thereon up to the date of termination;
- b) The Concessionaire shall transfer the Project Work in Progress and Project Assets to Grantor or its designee within thirty (30) days after the Termination Date;
- c) Grantor shall assume all Project Liabilities and contractual Liabilities and bear all Asset Transfer Costs.

If the termination is after the issue of Preliminary Certificate of Completion:

- a) Grantor shall pay to the Concessionaire an amount equal to Termination Value computed in accordance to in Schedule 6 to this agreement so as to allow the shareholders a rate of return at the rate of Termination Rate of Return on the Eligible Share Capital;
- b) The Concessionaire shall transfer the Project Assets to Grantor or to its designee;
- c) Grantor shall assume and discharge the Project Liabilities and the Contractual Liabilities and bear all Asset Transfer Costs;

13.5 Termination for Natural Events affecting the Project

If this Agreement terminates pursuant to Section 11.1.1 as a result of a Natural Event causing loss of or damage to the Project where (a) the parties agree to terminate this Agreement or (b) the Independent Engineer appointed pursuant determines that the continuation of the Project is not technically and financially viable, on the Transfer Date:





- a) No Termination Amount shall be payable to the Concessionaire by Grantor;
- b) The Concessionaire shall transfer the Project Assets to Grantor, or to its designee, at Grantor's discretion at an agreed assessed Recoverable Value of the assets to be assessed and certified by the Independent Engineer and Independent Auditor;
- c) Grantor shall have no obligation to assume or discharge the Project Liabilities or the Contractual Liabilities,

### 13.6 Termination for Indirect Government Political Events:

If this Agreement terminates pursuant to Section 11.1.2 (b) as a result of a Indirect Political Event;

- a) No termination amount shall be payable by Grantor to the Concessionaire;
- b) The Concessionaire shall transfer the project asset to Grantor or its designee, Grantor's discretion at Depreciated Historical Cost as certified by the Independent Engineer and Independent Auditor;
- c) Grantor shall assume or discharge the Project Liabilities or the Contractual Liabilities.

### 13.7 Transfer of Project Assets

13.7.1 From and after the Termination Date until the Transfer Date, Grantor shall have the right to cause, and the Concessionaire shall permit, independent consultants, retained by Grantor at its expense, to enter upon the Project Site at reasonable times, and upon reasonable notice to perform such inspections, studies and tests as are necessary or appropriate to enable Grantor to assess the condition of the site and/or the Project. On or before the Transfer Date, Grantor may instruct the Concessionaire to transfer the Project Assets to Grantor or its designee on the Transfer Date.

13.7.2 The transfer of assets shall be free and clear from all charges, mortgages, pledges, security interests, encumbrances or other liens created by the Concessionaire in favor of its Lenders; the Concessionaire shall transfer to Grantor all such representations and warranties that are capable of such transfer and that exist for the benefit of the Concessionaire on the Termination Date relating to any Project Assets transferred to Grantor hereunder, including, but not limited to, representations and warranties of title and marketability, fitness for purpose, merchantable quality, compliance with legal or other requirements, maintenance, condition and repair, whether express or implied.



13.7.3 Project Assets transferred shall include:

- (i) Project Site and Project Facilities constructed by Concessionaire;
- (ii) all rights to receive future revenues from the Project;
- (iii) all other proceeds due to the Concessionaire (including but not limited to insurance proceeds and damages) related to the Project Assets;
- (iv) all equipment, software, hardware, fittings, spare parts, stocks and other property used in connection with the Project Facilities;
- (v) all cash and bank balances and investments and other instruments owned;
- (vi) all technology or know-how required to operate and maintain the Project Facilities as per DPR;
- (vii) the benefit of all un-expired warranties, insurance and other contracts (to the extent assignable); and
- (viii) all manuals, drawings, documentation and information with respect to the Project Facilities.

13.7.4 The Concessionaire shall execute and deliver and, where capable of registration, register with the relevant authorities of the State Government and the Central Government such agreements and other instruments as Grantor may reasonably request in order to perfect the transfer of the Project Assets pursuant to this Section 13.

13.7.5 The Concessionaire shall remain exclusively responsible for all liabilities in connection with the Project other than those expressly assumed by Grantor.

13.7.6 If the transfer occurs before the Final Completion Date, the Concessionaire shall warrant that all work performed to the termination date shall have been performed in accordance with the requirements of the applicable laws and this Agreement, and the Development Security shall remain in force for a period of 12 (twelve) months after the date of transfer.

13.7.7 If the transfer occurs after the Final Completion Date the Concessionaire's warranty as to the performance, condition and quality of the Project Facilities shall survive the termination and continue in effect until the date which is the earlier of: (i) the date which is twelve months following the termination (ii) the expiry of the defects liability period in accordance with this Agreement. The Concessionaire shall ensure that the Development Security remains in effect during such period to secure the Concessionaire's obligations in respect of such warranties. However, the concessionaire shall not be held responsible if the performance of the project facilities, after the date of transfer, is due to negligence in operation.

13.8 Assumption of Project Liabilities and Contractual Obligations:

13.8.1 When the Concessionaire transfers the Project Assets to Grantor or its designee pursuant to Section 13.7:



- (a) Grantor or its designee shall assume all right, title and interest in the Project Assets so transferred without affecting the continuing rights of the Users of the Project Facilities and Project Site granted in accordance with this Agreement;
- (b) Grantor or its designee shall assume the Project Liabilities and the Contractual Obligations if provided for under the circumstances of the transfer in Section 13.1 to 13.6 above, and
- (c) Grantor shall use its reasonable endeavors to procure the Concessionaire's release from the Assigned Agreements.

13.8.2 Grantor shall indemnify the Concessionaire against (a) the Project Liabilities, (b) the Contractual Obligations, and (c) all claims, costs, expenses, liabilities, losses and obligations arising from the Project Assets after the Transfer Date.

### 13.9 Satisfaction and Release

13.9.1 Except as provided in Section 13.9.3, if the termination of this Agreement arises from a Grantor Event of Default or an Force Majeure Event or the effects thereof, the payment of the Termination Amount and, when the Project Assets are transferred to Grantor pursuant to Section 13.7.1, (a) the assumption and discharge of the Project Liabilities and the Contractual obligations by Grantor and (b) the performance by Grantor of its obligations to indemnify the Concessionaire shall be full satisfaction of Grantor's and any other statutory entity's obligations to the Concessionaire under any agreement or other document comprising the Project Agreements but shall be without prejudice to any rights or obligations under any such agreement or other document of the Concessionaire, Grantor or any statutory entity accrued prior to such termination (other than as a result of the event giving rise to termination or to the extent not reflected in the calculation of the Termination Amount) and any claims in respect thereof, which shall be unaffected by the termination of this Agreement and the payment of any amounts provided for in this Section. The Concessionaire shall release and discharge Grantor and all statutory entities from all obligations that are expressed in this Section 13.9.1 to be fully satisfied. References to rights of the Concessionaire shall be construed to include rights of the Investors enforceable under this agreement.

13.9.2 If the termination of this Agreement arises from a Concessionaire Event of Default or an Force Majeure Event or the effects thereof, the transfer to Grantor of the Project Assets, where so provided in Section 13, and the exercise of the rights of recourse provided in Section 13.10 shall be full satisfaction of the Concessionaire's obligations to Grantor or any statutory entity accrued prior to such termination (other than as a result of the event



giving rise to termination) an any claims in respect thereof, which shall be unaffected by the termination of this Agreement and the transfer of the Project Assets and exercise of the said rights of recourse. Grantor shall release and discharge the Concessionaire, and Grantor shall make best efforts to ensure that any statutory entity releases the Concessionaire, from all obligations which are expressed in this Section 13.9.2 to be fully satisfied.

13.9.3 If this Agreement is terminated as a result of Grantor Event of Default in Section 12.4 or an Force Majeure Event specified in Section 11.1.2(a) and, in either case, the relevant shares or assets include assets of the Concessionaire that are not comprised in the Project Assets, or in the case of shares, any value attributable thereto, in addition to receiving the Termination Amount pursuant to this Section 13, Concessionaire may pursue such other remedies as may be available to it under any applicable law with respect to obtaining redress or compensation for such assets or shares.

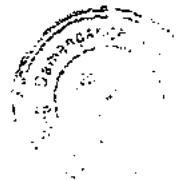
#### 13.10 Survival of Rights and Obligations:

Notwithstanding anything to the contrary contained in this Agreement, the rights and obligations of the Parties under this Agreement which by their nature survive the termination of this Agreement (e.g., the obligations under Sections 13.14, 15 and 19 etc.), shall not be extinguished by termination of this Agreement.

#### 13.11 Material Breach and Suspension

13.11.1 If the Concessionaire shall be in Material Breach of this Agreement Grantor shall be entitled in its sole discretion and without prejudice to its other rights and remedies under this Agreement including its right of Termination hereunder, to (i) suspend all or any of the rights of the Concessionaire under this Agreement including the Concessionaire's right to collect the Revenues from the Project Facilities, and (ii) exercise the rights of the Concessionaire under this Agreement itself or authorise any other person to exercise the same during such suspension. Such suspension by Grantor shall be by a communication in writing to the Concessionaire and shall be effective forthwith upon the issue thereof to the Concessionaire. Any Fees or revenues collected by or on behalf of Grantor during such suspension shall be retained and appropriated by Grantor to the exclusion of the Concessionaire. Provided, however, that the period of such suspension under this Section 13.11.1 shall not exceed 120 (one hundred twenty) days.

13.11.2 Subject to Section 13.11.1, Grantor shall have the right to utilise the proceeds of the Revenues, directly collected by the Concessionaire, for meeting the costs incurred by Grantor to remedy and rectify the cause of such suspension and for defraying the O&M Expenses in accordance with the Operation and Maintenance Agreement during such suspension period.



Provided, however, that if the Concessionaire is making diligent efforts to remedy and rectify such cause, then Grantor shall allow the Concessionaire reasonable time and opportunity for such remedy or rectification.

13.11.3 The suspension of the rights of the Concessionaire by Grantor pursuant to Section 13.11.1 above shall be revoked by Grantor forthwith upon the Concessionaire having remedied the Material Breach during such suspension period to the satisfaction of Grantor unless in the meantime this Agreement has been terminated by Grantor in accordance with Section 12.3.

13.11.4 At any time during the period of suspension, the Concessionaire may in writing notify to Grantor that it does not intend to cure the breach or default that had caused such suspension. Within 7 (seven) days of receipt of such notice, Grantor shall terminate this Agreement.



## 14 Intellectual Property and Confidentiality

### 14.1 Intellectual Property

The Concessionaire shall make available to Grantor for use free of charge, except where the same is vested in a third party, in which case the Concessionaire shall use all prudent commercial endeavors to procure that they are so made available, all Design Data and all other materials, documents and data of any nature acquired or brought into existence for the purposes of the design or construction of the Project Facilities or the operation, maintenance and improvement of the Project Facilities and which might reasonably be required by Grantor for the purposes of carrying out its duties under this Agreement or any statutory duties which the State Government and/or Central Government may entrust on it. Grantor will have ready and free access to such property developed at any time in the future.

### 14.2 Confidential Information

Subject to Article 14.3, both parties shall at all times both during the Term and for [ ] years following the termination or expiry of this Agreement:

- (i) use their reasonable endeavours to keep all information regarding the terms and conditions of this Agreement and any data or information acquired as a result of the negotiation and performance of this Agreement confidential and accordingly neither party shall disclose the same to any other person; and
- (ii) not use any document or other information (whether technical or commercial) obtained by them respectively as a result of the negotiation and performance of this Agreement or concerning the other's undertaking for any purpose other than performance of the party's obligations and exercise of its rights under this Agreement,

provided that the provisions of this Article 14.2 shall not apply to:

- (a) any information which at the time of disclosure was in the public domain other than by breach of the confidentiality obligations of this Article 14.2;
- (b) information relating to the Project in the possession of a party before that information was disclosed to it by or on behalf of the other party and which was not obtained under any obligation of confidentiality; and
- (c) information obtained from a third party who is free to disclose the same, and which is not obtained under any obligation of confidentiality.



### 14.3 Disclosure of Confidential Information

Either party shall be entitled to disclose the terms and conditions of this Agreement and any data or information acquired by it under or pursuant to this Agreement without the prior written consent of the other party if such disclosure is made in good faith:

- (i) to any affiliate of such party, having made it aware of the requirements of this Article or to any Indian Governmental Instrumentality; or
- (ii) to any outside consultants or advisers engaged by or on behalf of such party and acting in that capacity, having made them aware of the requirements of this Article; or
- (iii) to the Lenders, having made them aware of the requirements of this Article; or
- (iv) to the extent required by the rules of a relevant and recognised stock exchange; or
- (v) to the extent required by any applicable Law or pursuant to an order of any court of competent jurisdiction; or
- (vi) to any insurer under a policy of insurance effected under Article 10.1 or
- (vii) to directors, employees and officers of such party having made them aware of the requirements of this Article,

and is necessary to enable such party to perform this Agreement or to protect or enforce its rights under this Agreement or to enable it to comply with any requirement referred to in paragraphs (iv) and (v) above or to carry on its ordinary business.



## 15 Liability and Indemnity

### 15.1 Indemnity by the Concessionaire

The Concessionaire shall bear responsibility for loss of or damage to property, death, or injury to person, all third party claims and all expenses relating thereto (including without limitation reasonable legal fees) suffered by, or liability for which is attributed to Grantor, in connection with the Project Facilities, resulting from any negligent act or omission of the Concessionaire and/or its Contractors, Direct Contractors or Specified Contractors ("Concessionaire Indemnified Loss") without recourse to Grantor. The Concessionaire shall hold Grantor, fully indemnified in respect thereof. The said indemnity shall not extend to any Concessionaire Indemnified Loss to the extent that it was caused by any act or omission of Grantor, the State Government or any other statutory entity or the State Government or their failure to take reasonable steps in mitigation thereof.

### 15.2 Indemnity by Grantor

Grantor shall be responsible for loss or damage resulting from any negligent act or omission of Grantor ("Grantor Indemnified Loss"), without recourse to Concessionaire or its Contractors. Grantor will hold the Concessionaire fully indemnified in respect thereof. The indemnity shall not extend to any Grantor Indemnified Loss to the extent that it was caused by any act or omission of the Concessionaire or its Contractors, the failure of the Concessionaire and/or its Contractors to take reasonable steps in mitigation thereof.

### 15.3 Notice of Proceedings

Each party shall promptly notify the other party of any claim or proceeding in respect of which, but for the provisions of Section 15.4, it is entitled to be indemnified under this Section 10. Such notice shall be given as soon as reasonably practicable after the relevant party becomes aware of such claim or proceeding.

### 15.4 Basket Limitation

Neither party shall be entitled to receive any claim under this Section 15 until such time as all such claims by such party exceed the equivalent of Rupees Five Lakhs (5,00,000) in the aggregate, at which time all such claims of that party may be paid. Provided that, when such claims have been made, the same rule shall apply in respect of future claims. Notwithstanding the preceding sentence, either party shall be entitled to make any claim regardless of the amount, which claim if not made would be barred by the relevant statute of limitation.

### 15.5 Conduct of Proceedings

Each party shall have the right, but not the obligation, to contest, defend and litigate (and to retain legal advisers of its choice in connection therewith) any claim, action, suit or proceeding by any third party alleged or asserted against it, arising out of any





matter in respect of which it is entitled to be indemnified hereunder, and the reasonable costs and expenses thereof shall be subject to the said indemnity; Provided that, if the other party acknowledges in writing its obligation to indemnify the first-mentioned party in respect thereof to the full extent provided by this Section 15, such other party shall be entitled, at its option, to assume and control the defence of such claim, action, suit or proceeding at its expense and through legal advisers of its choice if it gives prompt notice of its intention to do so to the first-mentioned party and reimburses that party for the reasonable costs and expenses previously incurred by it prior to the assumption of such defence by the indemnifying party. Neither party shall settle or compromise any claim, action, suit or proceeding in respect of which it is entitled to be indemnified by the other party without the prior written consent of that party, which consent shall not be unreasonably withheld. Except where such consent is unreasonably withheld, if a party settles or compromises any claim, action, suit or proceeding in respect of which it would otherwise be entitled to be indemnified by the other party without the prior written consent of the other party, the other party shall be excused from any obligation to indemnify the party making such settlement or compromise in respect of such settlement or compromise.

#### 15.6 Double jeopardy

- 15.6.1 Grantor shall not cause any proceedings to be brought against the Concessionaire for any breach of its obligations under this Agreement without exhausting legal means as expressly provided in this Agreement.
- 15.6.2 The Concessionaire also shall not cause any proceedings to be brought against Grantor for any breach of its obligations under this Agreement without exhausting legal means as expressly provided in this Agreement.
- 15.6.3 The Concessionaire shall be entitled to an indemnity under this Section 15 only to the extent it has not received payment for the same loss, damage, death or injury under any other agreement relating to the Project. Grantor shall be entitled to an indemnity under this Section 15 only to the extent Grantor has not received payment under any other agreement in respect of the relevant acts or omissions.

#### 15.7 Consequential Losses

In no case shall the indemnities in Sections 15.1 and 15.2 extend to indirect or consequential loss or damage. Furthermore, subject to Section 21.9 neither party shall be responsible to the other party for indirect or consequential loss or damage resulting from the performance of obligations or the exercise of rights under or pursuant to this Agreement.



## 16 Assignment and Security

16.1 The Concessionaire shall not assign this agreement or transfer any of its assets unless otherwise allowed under this agreement and without the prior written consent of Grantor.

### 16.2 Creation of Security

Notwithstanding anything contained in the Section 16.1 above, for the purpose of financing the design, construction, completion, operation, maintenance of the Project, the Concessionaire may, create security over its rights and interests under or pursuant to (a) this Agreement (b) any agreement or other document comprising the Project Agreements (c) the fixed assets, of the Project (d) the movable property and intellectual property of Concessionaire, and (e) the revenues or any of the rights or assets of the Project.

## 17 Provisions Relating To Lenders, Investors and Concessionaire

### 17.1 Interests of Lenders and Investors

Grantor agrees that it will not take, and shall make best efforts to ensure that the State Government or other Statutory Entities will not take any Discriminatory Action that materially and adversely affects the interests of the Concessionaire or the Lenders under the Financing Agreement. If a non-discriminatory action of the State Government shall cause a material or adverse effect on such interests, Grantor may, at the request of the Concessionaire, use reasonable endeavors to assist the Concessionaire to mitigate such effect. If any such action of the State Government or other Statutory Entities shall cause a material and beneficial effect on such interests, the Concessionaire shall on its own accord, pass on such benefits to the Users or to Grantor through a mutually agreed method to be devised by the Independent Auditor.

The lenders will have right of substitution for the concessionaire in case of early termination of this agreement as per Section 12.5 (d).

### 17.2 Interests of the Concessionaire

Grantor shall make best efforts to submit to the State Government or other Statutory Entities that it does not take, any Discriminatory Action which materially and adversely affects the Project or the Project Facilities or the performance of the Concessionaire's obligations or enjoyment of rights under the Project Agreements or expropriate, or except as hereinafter provided, acquire the complex or the company, whether in whole or in part. If a Discriminatory Action of the State Government or a statutory entity shall cause any such material and adverse effect, Grantor may at the request of Concessionaire use its reasonable endeavors to assist the Concessionaire to mitigate such effect. If any action of the State Government shall cause a material and beneficial effect on the Project or the Project Facilities or the performance of the

Concessionaire's obligations, Concessionaire shall on its own accord pass on a reasonable quantum of such benefit to the Users and Grantor as per Section 17.1 above.

17.3 Restriction on Transfer of Shares of Concessionaire

17.3.1 The concessionaire must hold at least 51% of the equity of the project during the Concession period of the project or till the project is terminated under Section 12.

17.3.2 With respect to the transfer of registered ownership of any shares of Concessionaire, Concessionaire shall institute the procedures in this Section 17 and shall make appropriate provisions in its Articles of Association to ensure the compliance therewith in accordance with the provisions of this Section 17 and in accordance with the provisions of the Shareholders' Agreement to be entered into between Grantor and the Developer.

17.3.3 All transfer of shares of Concessionaire by either party during Concession Period shall require the consent of the other Party following procedures to be prescribed in the Shareholders' Agreement.

17.4 Redemption or Repayment of Capital

Concessionaire shall not redeem or repay its share capital, in whole or in part, during the term of this Agreement except with the prior consent of Grantor in accordance with the provisions of this Agreement and the Shareholders Agreement, which consent shall not be unreasonably withheld or delayed. This Section shall not apply to redemption or repayment of share capital occurring by reason of the winding-up, liquidation or dissolution of Concessionaire.

17.5 The Concessionaire and other shareholders shall execute, deliver and where capable of registration register, such further instruments including the Shareholders' Agreements in order to perfect the grant of the right conferred under this Section 17.



## 18 Taxation

### 18.1 Taxation of the Concessionaire

The taxation of the Concessionaire (which shall include levy of any duty, cess, fee or tax in this regard including stamp duty) would be in accordance with the provisions of the applicable laws and regulations of the State and Central Government of India as amended from time to time. The Concessionaire shall not be entitled to any claim of compensation from Grantor for any adverse general change in the provisions of the tax laws made by the State or Central Governments after the coming in force of this Agreement.

### 18.2 Taxation of Lenders

There shall be no liability on Grantor for any change in tax laws affecting the Lenders and any such additional liability shall be borne by the Concessionaire.



## 19 Governing Law, Resolution of Disputes and Waiver of Immunity

### 19.1 Governing Law

The rights and obligations of the parties under or pursuant to this Agreement shall be governed by and construed according to the laws of the Republic of India.

### 19.2 Amicable Settlement

In the event of any dispute, controversy or claim arises among the Parties in connection with this Agreement or the interpretation of any of its provisions upon the occurrence of an Event of Default, each Party shall appoint one senior representative who is not involved in the day-to-day operations relating to the Project and is readily available in the vicinity of Ahmedabad to serve on a consultation panel (the "Consultation Panel") and such Consultation Panel shall meet promptly upon the request of any member thereto or of any Party, in an effort to resolve such dispute, controversy, or claim. All such disputes shall be amicably settled through mutual consultation and negotiation between the representatives of the Consultation Panel. All reasonable costs incurred by the members of the Consultation Panel shall be borne equally by Grantor and the Concessionaire. The Parties hereby agree to use their best efforts to resolve all disputes under this Agreement through the Consultation Panel.

### 19.3 Mediation by Panel of Experts

- (a) In the event that the Parties are unable to resolve a dispute, controversy or claim in accordance with Section 19.2 above or upon occurrence of an Event of Default, then any Party may refer the dispute, controversy or claim to a Panel of Experts. Within fifteen (15) days of the issue of a notice of intention to refer the dispute to a Panel of Experts, the Concessionaire or Grantor shall either agree on the appointment of one person to act as expert, or failing agreement, appoint one expert each and such experts shall, within seven days of their appointment, designate a third person to act as expert in order to organise a Panel of Experts. The Consultation Panel may unanimously appoint a permanent Panel of Experts if so requested by the Parties.
- (b) The Party who initially issued the notice of intention to refer the matter to the Panel of Experts shall submit to the Panel of Experts and to the other Parties the following written documents: (i) a description of dispute; (ii) a statement of that Party's position; and (iii) copies of relevant documentary evidence on support of such position.
- (c) Within 10 days of receipt of the above documents, the other Party shall submit: (i) a description of dispute; (ii) a statement of that Party's position; and (iii) copies of relevant documentary evidence on support of such position.
- (d) The Panel of Experts may call for such further documentary evidence and/or interview such persons as they deem necessary in order to reach their decision.



- (e) The Panel of Experts shall reach a majority decision and give notice to the Parties of their decision within 20 days of receipt of the documents provided by the Parties pursuant to subsections (b) and (c) above. The decision of the Panel of Experts shall be binding unless a Party issues a notice of intention to refer the matter to arbitration in accordance with Section 19.4 below.
- (f) The costs of engaging the Panel of Experts shall be borne equally by the Parties, and each Party shall bear its own costs of preparing the materials for and making presentations to the Panel of Experts. In the event the Parties are unable to resolve a dispute, controversy or claim pursuant to this Section within 45 days of the date when such dispute, controversy or claim first arose, then the provisions of Section 19.4 shall apply to such dispute, controversy or claim.

#### **19.4 Arbitration**

- (a) In the event that the Parties are unable to resolve any dispute, controversy, or claim in accordance with Sections 19.2 or 19.3, such dispute, controversy or claim shall be finally settled by a panel of arbitrators (the "Arbitration Panel") in accordance with the Indian Arbitration and Conciliation Act, 1996. The Arbitration Panel shall consist of three parties. The Concessionaire and Grantor shall appoint an arbitrator each and such arbitrators shall, within seven days of their appointment, designate a third person to act as an arbitrator in order to organise an Arbitration Panel. The arbitral proceedings shall take place in Ahmedabad. The Arbitration shall be conducted in English in accordance with the Rules of Indian Council of Arbitration. The arbitrators shall award speaking orders.
- (b) Any dispute, controversy or claim referred to the Arbitration Panel in accordance with Section 19.4 (a) above shall be considered a commercial dispute arising under the Indian Arbitration and Conciliation Act, 1996.
- (c) Any award by the Arbitration Panel shall be final and binding on the Parties.
- (d) The Parties shall bear their respective costs of Arbitration.

#### **19.5 Multi-party Dispute Resolution**

The Parties shall agree to join any dispute resolution proceeding under this Agreement with any other dispute resolution pending in respect of any other Project Contract relating to substantially the same matter.

#### **19.6 Performance during Dispute Resolution**

Pending submission of a dispute, controversy or claim to the Consultation Panel, the Panel of Experts or the Arbitration Panel the Parties shall continue to perform all of their obligations under this Agreement, without prejudice to a final adjustment in accordance with such decision.



**19.7 Sovereign Immunity**

Grantor hereby unconditionally and irrevocably:

19.7.1 Agrees that the execution, delivery and performance by it of this Agreement and those agreements and other documents to which it is a party constitutes private and commercial acts rather than public or government acts and that it agrees to be bound by the provisions of the Gujarat Infrastructure Development Act, 1999;

19.7.2 Waives any right of immunity which it or any of its assets now has or may acquire in the future in any jurisdiction; and

19.7.3 Consents generally in respect of the enforcement of any judgment against it in any such proceedings in the courts of India.

**19.8 Enforcement**

The parties hereto agree to be subject to the laws in India with respect to this Project and hereby expressly and irrevocably waives any immunity in any jurisdiction in respect thereof.

**19.9 *In case of any conflict with any other agreement, unless otherwise agreed between the Concessionaire and Grantor, this Agreement would take priority.***



## 20 Accounts and Reports

### 20.1 Appointment of Statutory Auditors:

The Concessionaire shall make arrangements reasonably satisfactory to Grantor with respect to the installation and operation of an accounting and cost control system for Concessionaire and for the appointment as Statutory Auditors of a firm of independent chartered accountants reasonably acceptable to Grantor. On notice and for reasonable cause given to the Concessionaire, Grantor shall have the right, at its own expense, to have a firm of independent chartered accountants conduct additional audits of the Concessionaire by the Independent Auditor.

### 20.2 Right of Inspection:

The Concessionaire shall promptly furnish to Grantor such information as Grantor may from time to time reasonably request and permit representatives of Grantor on reasonable notice to visit the Project Facilities and any of the other premises where the business of the Concessionaire is conducted and to have access to its books of accounts and records in cases where Grantor has reasonable cause so to do.

### 20.3 Periodic Reports:

- (a) The Concessionaire shall, as soon as available but in any event within one hundred and eighty (180) days after the end of each financial year, furnish to Grantor: (i) two (2) copies of complete financial statement of Concessionaire for such financial year (which are in agreement with its books of accounts and prepared in accordance with accounting principles which are generally accepted in India and consistently applied), together with an audited report thereon, all in accordance with the requirements of the Companies Act, 1956; (ii) a copy of any management letter or other communication sent by the auditors to Concessionaire or to its management in relation to the Concessionaire's financial, accounting and other systems, management and accounts; (iii) a report by the auditors certifying that, based on its said financial statements, Concessionaire was in compliance with its financial obligations under the Financing Agreements as of the end of the relevant financial year or, as the case may be, detailing any non-compliance; and the Concessionaire shall authorise its auditors (whose fees and expenses shall be for the account of the Concessionaire) to communicate directly with Grantor at any time regarding Concessionaire's accounts and operations and shall furnish to Grantor a copy of such authorisation.
- (b) The Concessionaire shall, as soon as available but in any event within sixty (60) days of the end of each six (6) month period of each financial year, furnish to Grantor: (i) two (2) copies of Concessionaire's complete financial statements for such six (6) month period, all in accordance with the generally accepted





accounting principles in India consistently applied, and, if requested by Grantor, certified by an officer of the Concessionaire; (ii) a report on any factors materially and adversely affecting or which might materially and adversely affect the Concessionaire's business and operations or its financial condition; and (iii) (during construction of the Project) a report on the implementation and progress of the Project, containing such information as Grantor may reasonably require and disclosing any factors of which the Concessionaire is aware materially and adversely affecting, or which would be likely materially and adversely to affect, the carrying out of the Project.

#### 20.4 Reporting of Changes

The Concessionaire shall, within thirty (30) days of its becoming effective, report any (i) change in Concessionaire's Memorandum and Articles of Association; (ii) change in Concessionaire's financial year; (iii) change in the constitution of its Board of Directors; (iv) change in the appointment of its Chief Executive Officer, Chief Financial Officer or Secretary; and (v) the registration of a transfer of shares to any person who thereby becomes a registered holder of more than five (5) per cent. of the issued share capital of Concessionaire or of a transfer of shares to or from a person who, immediately prior to such transfer, held more than five (5) per cent of the issued share capital of Concessionaire.

#### 20.5 Providing of Lists of Lenders and Creditors:

Within ninety (90) days of the end of each financial year, the Concessionaire shall provide to Grantor a list of each of Concessionaire's lenders and creditors to which Concessionaire owes a sum in excess of the equivalent of Rupees Ten Lakhs (10,00,000) including the details as to the amounts due to each of them. This list shall also indicate any changes, as compared to the list submitted in the previous year that have occurred.

#### 20.6 Information regarding Statutory Notice/Winding-up Proceedings:

- (a) The Concessionaire shall, within seven (7) days of receipt thereof, provide to Grantor a copy of any notice that the Concessionaire may have been served under the Companies Act, 1956 by any of the Lenders or its creditors.
- (b) The Concessionaire shall provide to Grantor all information in respect of any further actions taken by the Lenders or creditors following the said notices under the Companies Act, 1956.

#### 20.7 Notices of Default:

- (a) The Concessionaire shall, within seven (7) days of receipt thereof, provide to Grantor a copy of any notice of breach, default or other failure to perform received by the Concessionaire from any other party to any agreement or other document comprising the Security Package and a statement in reasonable detail of the grounds for such notice.



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- (b) The Concessionaire shall provide to Grantor all information in respect of any further actions taken by the parties to such agreement or document following the said notices.



## 21 Miscellaneous Provisions

### 21.1 Notices

#### 21.1.1 Address of Notices

Any notice, request or other communication to be given or made under this Agreement shall be in writing and shall be delivered by courier, facsimile or registered mail. The address for service of each party and its facsimile number is set out opposite its name and the address set out below:

For the Concessionaire

For Grantor

#### 21.1.2 Effectiveness of Service

All notices shall be effective upon actual receipt thereof.

#### 21.1.3 Consents and Approvals

Any consent or approval of Government or any Relevant Authority referred to in this Agreement shall be deemed duly given if signed:-

- (a) in the case of a Specified Consent listed in Schedule 1, by an authorised official in the department identified as the Relevant Authority for that Specified Consent in Schedule 1; or
- (b) in the case of any other consent or approval, by the official, as the Chief Executive Officer/Managing Director/Chairman may notify the Concessionaire as being the responsible official for the relevant consent or approval;

Provided that Grantor or the relevant Authority may, by notice given in accordance with Section 21.1.1, designate a different official or department for the purposes of giving any consent or approval referred to in paragraph (a) or (b) above and not yet given.

### 21.2 Variations in Writing

All additions, amendments and variations to this Agreement shall be binding only if in writing and signed by duly authorised representatives of the parties.



### 21.3 Entire Agreement

This Agreement, including the Schedules, the finally agreed Technical Bid, RFP, shareholder's agreement, the DPR, LOI and any such agreements represents the entire understanding between the parties in relation to the subject matter hereof and supersedes any or all previous agreements or arrangements between the parties in respect of the Project (whether oral or written).

### 21.4 Waivers

21.4.1 No waiver by either party of any default by the other in the performance of any of the provisions of this Agreement:

(a) Shall operate or be construed as a waiver of any other or further default whether of a like or different character; or

(b) Shall be effective unless in writing duly executed by an authorised representative of such party.

21.4.2 The failure by either party to insist on any occasion upon the performance of the terms, conditions and provisions of this Agreement or time or other indulgence granted by one party to the other shall not thereby act as a waiver of such breach or acceptance of any variation.

### 21.5 Termination

This Agreement shall not be terminated except in the circumstances expressly set out in this Agreement.

### 21.6 Successors and Assigns:

This Agreement shall inure to the benefit of, and be binding upon, the successors and permitted assigns of the parties.

### 21.7 No Liability for Review:

No review or approval by Grantor of any agreement, document, instrument, drawing, specifications or design proposed by the Concessionaire shall relieve the Concessionaire from any liability that it would otherwise have had for its negligence in the preparation of such agreement, document, instrument, drawing, specification or design or failure to comply with the applicable laws of the State of Gujarat or the Central Government with respect thereto, nor shall Grantor be liable to the Concessionaire or any other person by reason of its review or approval of an agreement, document, instrument, drawing, specification, or design.



## 21.8 Third Party Beneficiaries:

21.8.1 Subject to Section 21.8.2, this Agreement shall not confer any right of suit or action whatsoever on any third party.

21.8.2 Notwithstanding the provisions of Section 21.8.1, the Concessionaire, both for obligations of Grantor referred to in Section 21.8.3 and to recover, for and on their behalf, any losses, damages or other amounts to which the Developer and Affiliates would have been entitled had they been parties to this Agreement: Provided, that in ascertaining the amount of any loss incurred by any of the aforementioned parties there shall be taken into account any amount payable by Grantor or any statutory entity to the Concessionaire for its own account in respect of that loss.

21.8.3 Section 21.8.2 shall only apply to (a) the obligations of Grantor in respect of the Investors under Sections 4.1.7 (b) any interference by Grantor in the payment by the Concessionaire to the Developer and Other Consortium Members of amount to which they are entitled under the Concessionaire's Memorandum and Articles of Association or any instrument constituting convertible securities of the Concessionaire on the due date for payment there under. The enforcement by the Concessionaire pursuant to Section 21.8.2 on behalf of the above parties shall not be regarded as the enforcement of a claim for indirect or consequential loss or damage for the purposes of Section 15.7.

## 21.9 Affirmation:

The Concessionaire declares and affirms that it and (so far as the Concessionaire is aware) the Developer and the Other Consortium Members and the Concessionaire's directors and employees have not paid nor undertaken to pay any bribe, pay-off or kick-back or unlawful commission and that it has not in any other way or manner which is unlawful paid any sums, whether in Rupees or Foreign Currency and whether in India or abroad, or in any other manner given or offered to give any gifts and presents in India or abroad, to any person or company to procure this Agreement or any other agreement or other document comprising the Project Agreements. The Concessionaire undertakes and shall cause the Users and other Consortium Members to undertake not to engage in any of the said or similar acts during the term of this Agreement.

## 21.10 Security Protection

The Concessionaire shall provide such security personnel, as it deems appropriate for the protection and security of the Project. Cost of such security personnel during the construction phase shall be part of the Project Cost and thereafter part of the Operations & Maintenance Cost.



### 21.11 Conversion

Conversion of foreign currency shall be as per provisions of the Foreign Exchange Management Act, 1999.

### 21.12 Payments by either party:

Subject to Section 13, all sums payable by either party under this Agreement shall be paid (except to the extent required by applicable law or as expressly permitted under this Agreement) (a) free of any restrictions or conditions, and (b) without deduction or withholding on account of set-off or counter-claim. Also all the payments to be made by either party must be made within 30 days from the due date of such payment or after receiving any such request by other party or as provided under any this Agreement. If the payments are not made within the stipulated time, the party making the payment, shall pay an interest of Prime Lending Rate + 5% per annum.

### 21.13 Partial Invalidity:

The illegality, invalidity or un-enforceability of any provision of this Agreement in whole or in part under the law of any jurisdiction shall not affect its legality, validity or enforceability under the law of any other jurisdiction, nor shall it affect the legality of any other provision or part hereof.

### 21.14 Relationship

*None of the provisions of this Agreement shall be deemed to constitute a partnership between the parties hereto and no Party shall have any authority to bind the other Party otherwise than under this Agreement or shall be deemed to be the agent of the other in any way.*

### 21.15 Cumulative Rights

All remedies of either Party under this Agreement whether provided herein or conferred by statute, civil law, common law, custom, trade, or usage are cumulative and not alternative and may be enforced successively or concurrently.

### 21.16 Cost and Expenses

Unless otherwise mentioned costs incurred by each party shall be borne by respective party.



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IN WITNESS whereof the parties have entered into this Agreement the date first above written.

1. For and on behalf of Grantor

By:

Name:

Designation:

2. For and on behalf of the Concessionaire

By:

Name:

Designation:

Witnesses:

1.

2.



### Schedule 1 : Specified Consents

(The comprehensive list shall be prepared with input from Grantor / GEB / EPD)

### Schedule 2 – Specification and Standards.

The specifications to build the Project shall be as specified in the RFP document of particular project, to be finalised in DPR, as this will differ from project to project.

However, some standard specifications may be prepared by Grantor, which can be applied across all the projects.

### Schedule 3 – Project completion and Construction Schedule

Sr. No.	Milestone Activity	Time Schedule

The time schedule for each activity may be indicated by the bidder in the RFP bid and which should be finalised in DPR to be prepared by the developer.

### Schedule 4 – Lease Rental Schedule

Land Lease Rates will be as under:

Land earmarked for the project.	As per project requirement
i) Premium (Up-front)	Rs. 0 per hectare.
ii) Lease Rent (Payable per annum)	Rs. 32,400 per hectare

Rate of lease rents shall be revised as per Government policy from time to time. Separate agreement shall be executed after finalization of land area required for project.

### Schedule 5 – Project Site map as per RFP and DPR for land area usage Plan

### Schedule 6 – Computation of Termination amount





YEARLY INFLOW, OVERFLOW, STORAGE, IRRIGATION USE, SURPLUS WATER DETAIL

Sr. No	Year	Inflow of water in Reservoir MCM	Maximum Reservoir water level mtr.	Live water storage at maximum water level MCM	Overflow of water MCM	Water used for Irrigation purpose. MCM	Surplus water ( Carry over water ) at Dt.- 15 June End of year		Remarks
							Water level on Dt.-15 June mtr.	Live storage MCM	
1	2	3	4	5	6	7	8	9	10
1	1991-92	2971.135	75.05	310.50	2710.69	165.710	68.60	132.00	
2	1992-93	2707.369	79.65	492.50	2396.72	189.008	63.78	37.00	
3	1993-94	4684.606	80.00	507.00	4335.14	168.368	65.0	75.00	
4	1994-95	4745.084	79.85	501.00	4557.50	241.255	63.79	37.00	
5	1995-96	1834.033	79.55	487.50	1404.43	314.933	72.15	220.50	
6	1996-97	2546.561	79.90	503.00	2239.24	250.647	64.75	52.50	
7	1997-98	2708.909	78.85	457.00	2346.02	304.075	70.85	185.50	
8	1998-99	2916.785	80.00	507.00	2570.48	272.673	64.85	54.00	
9	1999-2000	2589.092	80.00	507.00	2189.17	294.411	72.45	229.50	
10	2000-2001	2245.93	77.20	390.00	1669.70	447.042	67.20	102.00	
11	2001-2002	2610.70	79.95	505.00	2014.71	423.63	68.80	137.00	
12	2002-2003	2271.035	78.15	428.50	1761.96	444.395	64.35	46.00	
13	2003-2004	3020.496	80.00	507.00	2552.52	323.018	66.20	80.00	
14	2004-2005	4941.788	80.00	507.00	4379.60	301.383	62.85	20.00	
15	2005-2006								up to Oct. 2005

ANNEXURE - B  
DAMAN GANGA SMALL HYDRO POWER PROJECT (MADHUBAN) DAM  
Table Showing Ten Daily Reservoir Operation 1987 to 2003

Year	Month	Period date	Reservoir level		Reservoir capacity		Reservoir capacity Difference Col. 7 - Col. 5	Water Released through (M.cum)			Spillover quantity through (M.Cum.)	Total releases (M.cum)	Average reservoir level during period (m) (Col. 4+5)	Average reservoir area corresponding to g to Ave. level	Evaporation depth in mm.	Evaporation losses Mm <sup>3</sup> Col. 15x16 /1000	Other losses	Total Outflow	In flow
			at beginning of period	at end of period	at beginning	at end		RBHR	LBHR	BPO									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1987	June	1-10	61.90	61.30	71.00	62.00	-9.00	8.60	0.00	0.00	0.00	8.60	61.60	11.30	35.00	0.40	0.00	9.00	0.00
		11-20	61.30	61.05	62.00	61.00	-1.00	1.00	0.00	0.00	0.00	1.00	61.18	11.00	37.00	0.41	0.00	1.41	0.41
		21-31	61.05	61.40	61.00	64.00	3.00	3.00	0.00	0.00	0.00	3.00	61.23	11.00	33.00	0.36	0.00	3.36	6.36
	July	1-10	61.40	66.40	64.00	150.00	86.00	0.65	0.00	0.00	333.60	334.25	63.90	14.75	12.00	0.18	0.00	334.43	470.43
		11-20	66.40	66.25	150.00	146.50	-3.50	0.49	0.00	0.00	116.72	117.21	66.33	19.03	11.00	0.21	0.00	117.42	113.92
		21-31	66.25	66.40	146.50	150.00	3.50	0.22	6.11	0.00	63.95	84.28	66.33	19.03	12.00	0.23	0.00	84.51	88.01
	Aug	1-10	66.40	66.40	150.00	150.00	0.00	1.11	0.10	0.00	78.57	79.78	66.40	19.20	22.00	0.42	0.00	80.20	60.20
		11-20	66.40	68.45	150.00	151.00	1.00	0.78	0.10	0.00	222.89	223.77	67.43	20.88	24.00	0.50	0.00	224.27	225.27
		21-30	68.45	71.95	160.00	279.00	129.00	0.00	0.03	0.00	228.46	228.49	70.20	24.40	20.00	0.48	0.00	228.98	357.98
	Sept	1-10	71.95	72.95	278.00	302.50	23.50	0.00	0.00	0.00	53.41	53.41	72.45	31.08	37.00	1.15	0.00	54.56	78.06
		11-20	72.95	73.00	302.50	310.00	7.50	1.96	0.00	0.00	31.96	33.92	72.98	32.10	39.00	1.25	0.00	25.17	42.67
		21-31	73.00	73.00	310.00	310.00	0.00	1.89	0.00	0.00	22.11	24.00	73.00	32.40	35.00	1.13	0.00	25.13	25.13
	Oct	1-10	73.00	72.95	310.00	308.50	-1.50	1.02	0.03	0.00	23.89	25.84	72.98	32.35	49.00	1.59	0.00	27.43	25.93
		11-20	72.95	72.95	308.50	308.50	0.00	1.93	0.08	0.00	53.20	55.21	72.95	32.28	47.00	1.52	0.00	56.73	56.73
		21-30	72.95	73.05	308.50	311.50	3.00	0.00	0.00	0.00	0.00	0.00	73.00	32.40	52.00	1.68	0.00	1.68	4.68
	Nov.	1-10	73.05	73.05	311.50	311.50	0.00	1.48	0.00	0.00	0.00	1.48	73.05	32.50	42.00	1.37	0.00	2.85	2.85
		11-20	73.05	73.10	311.50	313.00	1.50	2.60	0.15	0.00	0.00	2.95	73.03	32.56	44.00	1.43	0.00	4.98	5.98
		21-31	73.10	73.10	313.00	310.00	-3.00	0.00	0.00	0.00	10.76	10.76	73.05	32.50	40.00	1.30	0.00	12.06	9.06
	Dec.	1-10	73.00	72.30	310.00	290.00	-20.00	0.83	0.07	0.00	17.80	16.70	72.65	31.68	41.00	1.30	0.00	20.00	0.00
		11-20	72.30	71.50	290.00	267.00	-23.00	2.32	0.14	0.00	19.25	21.71	71.90	30.10	43.00	1.28	0.00	23.00	0.00
		21-31	71.50	71.40	267.00	263.00	-4.00	1.46	0.00	0.00	1.40	2.86	71.45	29.30	39.00	1.14	0.00	4.90	0.00
	Jan.	1-10	71.40	71.00	263.00	254.00	-9.00	1.37	0.10	0.00	6.41	7.88	71.20	28.80	39.00	1.12	0.00	9.00	0.00
		11-20	71.00	69.50	254.00	217.00	-37.00	2.31	0.13	0.00	37.95	36.02	70.25	26.60	37.00	0.98	0.00	37.00	0.00
		21-28	69.50	66.65	217.00	156.00	-60.00	0.00	0.00	0.00	61.09	51.09	68.08	22.20	41.00	0.91	0.00	62.00	0.00
	Feb.	1-10	66.65	65.80	156.00	138.00	-17.00	2.57	0.14	0.00	13.43	16.14	66.23	18.78	46.00	0.86	0.00	17.00	0.00
		11-20	65.80	65.60	138.00	134.00	-4.00	2.86	0.17	0.00	0.00	3.03	65.70	17.85	49.00	0.87	0.00	3.90	-0.10
		21-31	65.60	65.55	134.00	133.00	-1.00	0.24	0.00	0.00	0.20	0.24	65.58	17.57	43.00	0.75	0.00	1.00	0.00





Year	Month	Period date	Reservoir level		Reservoir capacity		Reservoir capacity Difference Col. 7 - Col. 6	Water Released through (M.cum)			Spillover Quantity through (M.Cum.)	Total releases (M.Cum)	Average reservoir level during period (m) (Col. 4+5)	Average reservoir area correspondin g to Ave. level (Col. 4+5)	Evaporation depth in mm.	Evaporation losses mm <sup>2</sup> Col. 15x16 /1000	Other losses	Total Outflow	In flow
			at beginning of period	at end of period	at beginning	at end		RBHR	LBHR	BFO									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1958	Feb.	1-10	74.35	74.10	353.50	345.00	-8.50	2.77	0.33	0.00	0.00	3.10	74.23	34.86	46.00	1.60	3.80	8.50	0.00
		11-20	74.10	74.05	345.00	343.50	-1.50	0.00	0.00	0.00	0.00	0.00	74.08	34.56	48.00	1.66	0.00	1.66	0.16
		21-31	74.05	73.90	343.50	338.00	-5.50	1.68	0.22	0.00	0.00	1.90	73.98	34.35	46.00	1.58	2.02	5.50	0.00
	March	1-10	73.90	73.70	338.00	331.00	-7.00	2.46	0.28	0.00	0.00	2.75	73.80	0.00	50.00	0.00	2.45	5.20	-1.80
		11-20	73.70	73.65	331.00	329.00	-2.00	0.00	0.16	0.00	0.00	0.16	73.66	33.76	57.00	1.92	0.00	2.08	0.08
		21-30	73.65	73.40	329.00	322.00	-7.00	4.64	0.01	0.00	0.00	4.86	73.53	33.46	48.00	1.61	0.53	7.00	0.00
	April	1-10	73.40	73.30	322.00	318.00	-3.00	0.00	0.21	0.00	0.00	0.21	73.35	33.10	66.00	2.25	0.54	3.00	0.00
		11-20	73.30	73.05	318.00	311.50	-7.50	5.91	0.37	0.00	0.00	6.28	73.18	32.76	72.00	2.36	0.00	6.64	1.14
		21-31	73.05	72.85	311.50	305.50	-6.00	2.24	0.17	0.00	0.00	2.42	72.95	32.28	68.00	2.20	1.39	6.01	0.01
	May	1-10	72.85	72.70	305.50	301.00	-4.50	2.32	0.20	0.00	0.00	2.52	72.78	31.87	75.00	2.39	0.00	4.91	0.41
		11-20	72.70	72.45	301.00	294.50	-6.50	4.03	0.17	0.00	0.00	4.20	72.58	31.56	78.00	2.46	0.00	6.66	0.16
		21-30	72.45	70.90	294.50	252.00	-42.50	0.61	0.20	0.00	38.59	39.40	71.88	29.72	72.00	2.14	0.96	42.50	0.00
							192.00	43.57	4.77		2988.05	3036.39		44.33		12.25	3092.86	3284.95	
1959	June	1-10	70.90	65.45	252.00	131.00	-121.00	7.53	0.22	0.00	10.52	18.37	66.18	22.45	0.00	0.00	102.61	120.98	-0.02
		11-20	65.45	66.55	131.00	153.00	22.00	4.20	0.00	0.00	0.00	4.20	66.00	18.40	0.00	0.00	0.00	4.20	26.20
		21-31	66.55	64.35	153.00	111.00	-42.00	6.56	0.00	35.42	0.00	41.98	65.45	17.48	0.00	0.00	0.00	41.98	-0.02
	July	1-10	64.35	66.15	111.00	144.50	33.50	1.46	0.00	0.00	11.68	13.34	65.25	17.10	16.00	0.27	0.00	13.61	47.11
		11-20	66.15	66.50	144.50	152.00	7.50	3.06	0.00	0.00	98.13	99.19	66.33	19.02	19.00	0.36	0.00	99.55	107.05
		21-31	66.50	66.85	152.00	165.00	3.00	0.57	0.00	0.00	559.11	559.68	66.58	19.38	16.00	0.31	0.00	559.99	562.99
	Aug	1-10	66.85	68.50	155.00	193.00	40.00	3.36	0.44	0.00	71.72	75.52	67.56	21.35	15.00	0.32	0.00	75.84	115.84
		11-20	68.50	71.85	196.00	276.50	81.50	0.00	0.00	0.00	142.79	142.79	70.18	26.45	13.00	0.34	0.00	143.13	224.63
		21-30	71.85	74.10	276.50	345.00	68.50	0.00	0.00	0.00	451.78	451.78	72.98	32.35	13.00	0.42	0.00	452.20	520.70
	Sept.	1-10	74.10	75.10	345.00	377.00	32.00	0.00	0.00	0.00	90.46	90.46	74.60	35.50	26.00	0.92	0.00	91.38	123.38
		11-20	75.10	76.20	377.00	416.00	38.00	0.00	0.00	0.00	90.46	90.46	75.65	37.90	28.00	1.06	0.00	91.52	130.52
		21-31	76.20	77.90	416.00	484.00	68.00	0.88	0.00	0.00	133.11	133.99	77.05	31.12	31.00	0.96	0.00	134.95	202.95
	Oct.	1-10	77.90	77.45	484.00	464.50	-19.50	0.34	0.00	0.00	11.39	11.73	77.58	42.70	45.00	1.92	0.00	13.65	-5.65
		11-20	77.45	77.45	484.50	484.50	0.00	2.24	0.00	0.00	12.97	15.21	77.45	42.12	43.00	1.81	0.00	17.02	17.02
		21-30	77.45	77.25	484.50	457.00	-7.50	0.37	0.00	0.00	0.00	0.37	77.35	41.88	47.00	1.97	0.00	2.34	-5.16
	Nov.	1-10	77.25	77.00	457.00	447.00	-10.00	2.30	0.17	0.00	0.00	2.47	77.13	41.30	40.00	1.65	5.88	10.00	0.00
		11-20	77.00	76.95	447.00	445.00	-2.00	1.52	0.23	0.00	0.00	1.75	76.98	40.95	43.00	1.76	0.00	3.51	1.51
		21-31	76.95	76.80	445.00	438.00	-7.00	0.24	0.13	0.00	0.00	0.37	76.68	40.70	50.00	2.04	3.99	5.40	-0.61



Year	Month	Period date	Reservoir level		Reservoir capacity		Reservoir capacity difference Col. 7 - Col. 6	Water Released (through)			Spillway quantity through (M.Cum.)	Total releases (M.cum)	Average reservoir level during period (m) (Col. 4+5)	Average reservoir area corresponding to Ave. level	Evaporation depth in mm.	Evaporation losses Nil Col. 15+16 /1000	Other losses	Total Outflow	In flow
			at beginning of period	at end of period	at beginning	at end		RBHR	LBHR	BPO									
1989	Dec.	1-10	76.80	76.45	438.00	426.00	-12.00	2.81	0.21	0.00	0.00	3.02	76.63	40.05	47.00	1.88	7.10	12.00	0.00
		11-20	76.45	76.30	426.00	420.00	-6.00	0.00	0.00	0.00	0.00	0.00	76.38	39.45	46.00	1.81	4.19	6.00	0.00
		21-31	76.30	75.90	420.00	404.00	-16.00	4.11	0.27	0.00	0.00	4.35	76.10	38.90	48.00	1.86	9.76	16.00	0.00
1990	Jan.	1-10	75.10	75.75	404.00	398.50	-5.50	0.00	0.00	0.00	0.00	0.00	75.83	38.24	42.00	1.61	3.89	5.50	0.00
		11-20	75.75	75.45	398.50	389.00	-9.50	4.74	0.25	0.00	0.00	4.89	75.60	37.80	46.00	1.74	2.77	9.50	0.00
		21-28	75.45	75.00	389.00	374.00	-15.00	0.67	0.17	0.00	0.00	0.84	75.23	36.94	49.00	1.81	12.35	15.00	0.00
	Feb.	1-10	75.30	74.70	374.00	364.00	-10.00	3.46	0.31	0.00	0.00	3.79	74.85	36.10	41.00	1.59	4.52	10.00	0.00
		11-20	74.70	74.40	364.00	355.00	-8.00	2.19	0.25	0.00	0.00	2.44	74.55	35.42	45.00	1.59	3.98	8.00	0.02
		21-31	74.40	74.20	355.00	348.00	-8.00	0.00	0.00	0.00	0.00	0.00	74.30	35.00	43.00	1.51	6.49	8.00	0.00
	March	1-10	74.20	73.80	348.00	334.00	-14.00	6.34	0.38	0.00	0.00	6.72	74.00	34.40	56.00	2.00	5.29	14.01	0.01
		11-20	73.80	73.55	334.00	326.00	-8.00	0.00	0.00	0.00	0.00	0.00	73.68	33.76	62.00	2.09	5.91	8.00	0.00
		21-30	73.55	73.15	326.00	314.50	-11.50	6.50	0.38	0.00	0.00	6.86	73.35	33.10	68.00	2.25	2.89	12.00	0.50
	April	1-10	73.15	72.90	314.50	307.00	-7.50	0.00	0.00	0.00	0.00	0.00	73.03	32.44	69.00	2.24	5.26	7.50	0.00
		11-20	72.90	72.60	307.00	296.00	-11.00	4.41	0.25	0.00	0.00	4.66	72.70	31.75	71.00	2.25	4.09	11.00	0.00
		21-31	72.60	72.10	296.00	284.00	-12.00	4.60	0.13	0.00	0.00	4.73	72.30	30.95	71.00	2.20	5.07	12.00	0.00
	May	1-10	72.10	71.90	284.00	278.00	-6.00	0.00	0.00	0.00	0.00	0.00	72.00	30.30	57.00	1.73	4.27	6.00	0.00
		11-20	71.90	71.35	278.00	262.00	-16.00	10.95	0.44	0.00	0.00	11.39	71.63	29.63	62.00	1.84	2.77	16.00	0.00
		21-30	71.35	65.80	262.00	136.00	-124.00	0.00	0.00	175.00	0.00	175.00	68.58	29.26	67.00	1.96	0.00	176.56	52.56
1990	June	1-10	65.80	64.90	136.00	120.00	-16.00	63.43	4.21	210.42	1682.42	1982.42							
		11-20	64.90	64.85	120.00	121.00	1.00	3.03	0.21	0.00	0.00	3.24	65.35	17.25	37.60	0.65	14.12	18.00	2.00
		21-31	64.85	65.70	121.00	136.00	15.00	2.52	0.21	12.35	0.00	15.08	64.93	16.55	38.00	0.63	0.00	15.71	16.71
	July	1-10	65.70	66.25	136.00	146.50	10.50	1.82	0.00	0.00	0.00	1.75	65.33	17.23	37.40	0.64	0.00	2.40	17.40
		11-20	66.25	70.45	146.50	239.50	93.00	5.68	0.42	0.00	0.00	255.41	65.98	18.34	22.60	0.41	0.00	255.82	266.32
		21-31	70.45	72.40	239.50	289.00	53.50	3.95	0.10	0.00	0.00	174.38	68.35	22.93	23.20	0.53	0.00	174.92	267.32
	Aug	1-10	72.40	72.70	289.00	301.00	8.00	9.74	0.25	0.00	0.00	244.88	71.43	29.11	22.70	0.65	0.00	245.52	299.02
		11-20	72.70	71.80	301.00	304.00	3.00	0.78	0.00	0.00	0.00	236.93	72.55	31.47	14.10	0.44	0.00	247.36	255.36
		21-30	71.80	77.15	304.00	453.00	149.00	0.00	0.00	0.00	0.00	774.50	72.25	30.82	14.30	0.44	0.00	774.94	777.34
	Sept.	1-10	77.15	78.60	453.00	512.00	59.00	0.00	0.00	0.00	0.00	424.37	74.48	35.83	14.60	0.52	0.00	424.89	573.89
		11-20	78.60	78.90	512.00	524.00	12.00	0.00	0.00	0.00	0.00	122.97	77.98	43.18	21.00	0.91	0.00	123.88	182.88
		21-31	78.90	76.25	524.00	619.00	15.90	0.00	0.00	0.00	0.00	83.48	78.75	45.37	20.00	0.81	0.00	84.39	166.38
	Oct.	1-10	76.25	78.80	619.00	563.00	-56.00	0.00	0.00	0.00	0.00	323.47	76.08	49.16	25.00	1.05	0.00	324.54	339.54
		11-20	78.80	78.80	563.00	568.00	5.00	0.00	0.00	0.00	0.00	115.51	79.53	47.31	32.80	1.56	0.00	117.07	142.07
		21-30	78.80	78.80	568.00	568.00	0.00	0.00	0.00	0.00	0.00	62.12	78.85	48.18	41.50	2.00	0.00	64.11	68.11
	Nov.	1-10	78.80	78.80	568.00	568.00	0.00	4.24	0.00	0.00	0.00	17.16	78.90	48.37	49.00	2.40	0.00	19.58	19.58
		11-20	78.80	78.80	568.00	568.00	0.00	0.00	0.00	0.00	0.00	0.47	78.83	48.12	43.80	2.11	3.42	6.00	0.00
		21-30	78.80	78.80	568.00	568.00	0.00	0.00	0.00	0.00	0.00	0.47	78.83	48.12	43.80	2.11	3.42	6.00	0.00
	Dec.	1-10	78.80	78.80	568.00	568.00	0.00	5.17	0.31	0.00	0.00	5.48	78.88	47.43	38.60	1.88	9.65	17.00	0.00
		11-20	78.80	78.80	568.00	568.00	0.00	0.00	0.00	0.00	0.00	0.00	78.78	46.68	37.80	1.76	8.24	10.00	0.00
		21-31	78.80	78.80	568.00	568.00	0.00	0.00	0.00	0.00	0.00	0.00	78.78	46.68	37.80	1.76	8.24	10.00	0.00
	Dec.	1-10	78.80	78.80	568.00	568.00	0.00	4.20	0.28	0.00	0.00	4.47	78.85	45.87	35.60	1.63	10.69	17.00	0.00
		11-20	78.80	78.80	568.00	568.00	0.00	0.00	0.00	0.00	0.00	1.75	78.55	47.87	32.30	1.00	13.21	16.00	0.00
		21-31	78.80	78.80	568.00	568.00	0.00	2.37	0.13	0.00	0.00	2.51	78.55	47.87	32.30	1.00	13.21	16.00	0.00



Year	Month	Period date	Reservoir level		Reservoir capacity		Reservoir capacity difference Col. 7 - Col. 6	Water Released through (M.cum)			Spillover quantity through (M.Cum.)	Total releases (M.Cum.)	Average reservoir level during period (m) (Col. 4+5)	Average reservoir area correspondin g to Ave. level	Evaporation depth in mm.	Evaporation losses Mm <sup>3</sup> Col. 15x16 (1000)	Other losses	Total Outflow	In flow
			at beginning of period	at end of period	at beginning	at end		RBHR	LBHR	BPO									
1981	Jan.	1-10	77.85	77.30	482.00	459.00	-23.00	6.59	0.18	0.00	0.00	6.77	77.58	42.43	29.70	1.26	14.10	22.13	-0.87
		11-20	77.30	77.00	459.00	447.00	-12.00	0.00	0.04	0.00	0.00	0.04	77.15	41.37	34.70	1.44	10.05	11.52	-0.48
		21-31	77.00	76.45	447.00	426.00	-21.00	7.64	0.31	0.00	0.00	7.91	76.73	40.31	47.20	1.90	11.18	21.00	0.00
	Feb.	1-10	76.45	76.20	426.00	416.00	-10.00	0.00	0.00	0.00	0.00	0.00	76.33	39.31	41.90	1.65	8.35	10.00	0.00
		11-20	76.20	75.95	416.00	405.50	-10.50	6.85	0.33	0.00	0.00	7.18	76.08	38.65	44.50	1.72	1.80	10.50	0.00
		21-31	75.95	75.80	405.50	400.00	-5.50	1.24	0.10	0.00	0.00	1.34	75.88	38.25	38.70	1.48	2.69	5.50	0.00
	March	1-10	75.80	75.65	400.00	395.50	-4.50	3.69	0.18	0.00	0.00	3.87	75.73	35.39	50.90	1.80	0.00	5.67	1.17
		11-20	75.65	75.60	395.50	391.00	-4.50	5.94	0.28	0.00	0.00	6.22	75.58	37.87	60.70	2.30	0.00	8.51	4.01
		21-30	75.60	75.40	391.00	387.00	-4.00	0.00	0.00	0.00	0.00	0.00	75.45	37.43	73.10	2.74	1.28	4.00	0.00
	April	1-10	75.40	74.95	387.00	372.50	-14.50	2.22	0.46	0.00	0.00	2.68	75.18	36.84	59.30	2.16	0.00	4.87	-9.63
		11-20	74.95	74.70	372.50	364.00	-8.50	1.85	0.00	0.00	0.00	1.95	74.83	36.24	66.00	2.39	4.16	6.50	0.00
		21-31	74.70	74.55	364.00	359.50	-4.50	5.87	0.14	0.00	0.00	6.01	74.63	35.78	60.90	2.18	0.00	8.19	3.69
	May	1-10	74.55	74.05	359.50	343.50	-16.00	11.04	0.17	0.00	2.09	13.30	74.30	34.96	58.60	2.05	0.65	16.00	0.00
		11-20	74.05	66.90	343.50	180.00	-163.50	3.28	0.00	0.00	178.58	181.87	70.48	27.25	59.80	1.63	0.00	183.50	0.00
		21-30	66.90	64.85	180.00	121.00	-58.00	10.68	0.19	7.48	19.82	38.17	65.93	18.30	66.60	1.26	0.00	39.42	0.42
1981	June	1-10	65.00	66.95	122.00	161.00	39.00	114.56	4.81	18.83	3028.67	3187.65	65.98	18.40	17.80	0.33	0.00	74.87	113.87
		11-20	66.95	65.25	161.00	128.00	-33.00	6.94	0.00	0.00	67.60	74.54	66.10	18.60	14.10	0.26	16.23	33.00	0.00
		21-31	65.25	65.84	128.00	138.60	10.60	7.34	0.00	1.17	8.00	16.51	65.55	17.59	19.70	0.35	0.00	11.49	22.29
	July	1-10	65.84	66.39	138.60	149.80	13.00	4.50	0.00	0.00	59.42	63.82	66.12	18.62	28.50	0.53	0.00	64.45	77.45
		11-20	66.39	67.21	149.80	167.15	17.35	1.87	0.00	0.00	511.48	513.35	66.80	19.94	6.70	0.13	0.00	513.48	530.83
		21-31	67.21	67.62	167.15	176.60	9.45	0.00	0.00	0.00	1048.91	1048.91	67.42	20.97	4.20	0.09	0.00	1049.00	1058.45
	Aug	1-10	67.62	67.04	176.60	162.00	-14.60	0.00	0.00	0.00	280.07	280.07	67.33	20.90	12.50	0.26	0.00	280.33	285.73
		11-20	67.04	67.09	162.00	164.70	2.70	0.00	0.00	0.00	269.99	269.99	67.07	20.26	10.20	0.21	0.00	270.20	272.90
		21-30	67.09	68.82	164.70	202.40	37.70	0.00	0.00	0.00	421.27	421.27	67.96	21.99	7.20	0.16	0.00	421.43	459.13
	Sept.	1-10	68.82	73.06	202.40	311.60	109.20	0.00	0.00	0.00	0.00	0.00	70.94	28.30	17.10	0.46	0.00	0.43	109.88
		11-20	73.06	74.38	311.60	355.00	43.40	0.14	0.00	0.00	0.00	0.14	73.72	34.08	33.90	1.15	0.00	1.28	44.49
		21-31	74.38	74.92	355.00	371.80	16.80	6.31	0.02	0.00	0.00	6.33	74.65	35.70	38.10	1.36	0.00	7.69	24.29



Year	Month	Period date	Reservoir level		Reservoir capacity		Reservoir capacity Difference Col. 7 - Col. 6	Water Released through (M.Cum.)			Spillover Quantity through (M.Cum.)	Total releases (M.Cum.)	Average reservoir level during period (m) (Col. 4+5)	Average reservoir area corresponding to Ave. level	Evaporation depth in mm.	Evaporation losses Mm <sup>3</sup> Col. 15x16 /1000	Other losses	Total Outflow	In flow	
			at beginning of period	at end of period	at beginning	at end		RBHR	LBHR	BPO										
1992	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Oct.	1-10	74.92	75.03	371.60	374.90	3.30	0.64	0.21	0.00	0.00	0.85	74.98	36.35	37.54	1.36	0.00	2.22	5.52
			11-20	75.03	74.90	374.90	371.00	-3.90	7.26	0.20	0.00	0.00	7.47	74.97	36.33	40.60	1.47	0.00	8.94	5.04
			21-30	74.90	74.80	367.00	367.00	-4.00	6.84	0.29	0.00	0.00	7.13	74.85	36.10	59.40	2.14	0.00	9.27	5.27
		Nov.	1-10	74.80	74.80	367.00	367.00	0.00	0.00	0.05	0.00	0.00	0.06	74.80	36.00	53.40	1.92	0.00	1.88	1.98
			11-20	74.80	74.59	367.00	360.70	-6.30	8.91	0.31	0.00	0.00	9.22	74.70	35.74	41.80	1.49	0.00	10.71	4.41
			21-31	74.59	74.46	360.70	357.20	-3.50	5.63	0.06	0.00	0.00	5.89	74.53	35.39	36.80	1.30	0.00	6.99	3.49
		Dec.	1-10	74.40	74.16	357.20	346.80	-10.40	8.67	0.24	0.00	0.00	8.91	74.28	35.00	37.70	1.32	0.17	10.40	0.00
			11-20	74.16	74.03	346.80	342.90	-3.90	3.30	0.10	0.00	0.00	3.39	74.10	34.59	46.90	1.62	0.00	5.02	1.12
			21-31	74.03	73.99	342.90	341.80	-1.10	0.31	0.17	0.64	0.00	1.11	74.01	34.42	32.50	1.12	0.00	2.23	1.13
		Jan.	1-10	73.99	73.64	341.80	328.60	-13.20	9.58	0.11	1.81	0.00	11.50	73.82	34.03	36.70	1.25	0.45	13.20	0.00
1992			11-20	73.64	73.55	328.60	326.00	-2.60	1.28	0.11	1.47	0.00	2.87	73.60	34.08	45.00	1.53	0.02	4.40	1.80
			21-28	73.55	73.15	326.00	314.50	-11.50	9.77	0.07	1.62	0.00	11.45	73.35	33.09	47.10	1.56	0.00	13.01	1.51
		Feb.	1-10	73.15	73.08	314.50	312.40	-2.10	0.82	0.13	1.47	0.00	2.43	73.12	32.63	41.60	1.36	0.00	3.78	1.68
			11-20	73.08	72.07	312.40	306.10	-6.30	3.38	0.04	1.47	0.00	4.89	72.58	32.32	42.20	1.36	0.05	6.30	0.00
			21-31	72.87	72.56	306.10	297.20	-8.90	6.70	0.18	1.32	0.00	8.20	72.72	31.80	46.80	1.49	0.00	9.69	0.79
		March	1-10	72.56	72.47	297.20	295.10	-2.10	0.00	0.04	1.47	0.00	1.51	72.52	31.43	55.00	1.73	0.00	3.24	1.14
			11-20	72.47	72.10	295.10	284.00	-11.10	8.62	0.09	1.47	0.00	10.18	72.29	30.92	61.00	1.89	0.00	12.07	0.97
			21-30	72.10	71.85	284.00	276.50	-7.50	4.24	0.18	1.62	0.00	6.01	71.98	30.25	71.90	2.17	0.00	8.19	0.89
		April	1-10	71.85	71.54	276.50	268.20	-8.30	5.12	0.04	1.47	0.00	6.64	71.70	29.74	58.00	1.72	0.00	8.36	0.06
			11-20	71.54	71.05	268.20	255.00	-13.20	11.18	0.09	1.47	0.00	12.74	71.30	28.99	64.70	1.88	0.00	14.62	1.42
			21-31	71.05	70.84	255.00	250.20	-4.80	3.43	0.12	1.47	0.00	5.01	70.95	28.25	60.20	1.70	0.00	6.71	1.91
1992		May	1-10	70.84	70.24	250.20	234.80	-15.40	11.76	0.12	1.47	0.00	13.37	70.84	27.29	70.30	1.92	0.12	15.40	0.00
			11-20	70.24	69.84	234.80	226.80	-8.00	3.69	0.18	1.47	0.00	5.35	70.09	26.21	69.10	1.81	0.57	7.73	-0.27
			21-30	69.84	69.32	226.80	213.40	-13.40	12.09	0.04	1.82	0.00	13.75	69.83	25.21	73.20	1.85	0.00	15.60	2.20
								93.40	171.46	3.17	24.48	2865.87				44.29		2927.75	3021.15	
		June	1-10	69.32	58.98	213.40	205.60	-7.80	4.10	0.21	1.47	0.00	5.78	69.15	24.27	64.60	1.57	0.00	7.34	-0.46
			11-20	58.98	58.77	205.60	201.40	-4.20	8.09	0.02	1.47	0.43	10.01	68.88	23.74	51.50	1.22	0.00	11.23	7.03
			21-31	58.77	58.05	201.40	143.00	-58.40	0.00	0.00	0.26	119.33	119.58	67.41	21.00	21.20	0.45	0.00	120.03	61.63
		July	1-10	58.05	55.76	143.00	137.20	-5.80	3.48	0.23	0.00	16.41	20.11	65.91	18.21	31.90	0.58	0.00	20.69	14.89
			11-20	55.76	55.76	137.20	158.50	21.30	8.12	0.16	0.00	4.07	12.37	66.31	18.92	14.50	0.27	0.00	12.64	33.94
			21-31	55.85	70.85	158.50	250.50	92.00	0.00	0.00	0.00	115.33	115.33	68.85	23.96	10.70	0.26	0.00	115.59	207.59

Year	Month	Period date	Reservoir level at beginning of period	Reservoir level at end of period	Reservoir capacity at beginning	Reservoir capacity at end	Reservoir capacity Difference Col. 7 - Col. 6	Water Released Through (M.cum.)			Spillover Quantity through (M.Cum.)	Total releases (M.cum.)	Average reservoir level during period (m) (Col. 4+5)	Average reservoir area corresponding to Ave. level	Evaporation depth in mm.	Evaporation losses Mm. Col. 15x16 /1000	Other losses	Total Outflow	In flow
			4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Aug	1-10	70.88	72.54	250.50	296.80	46.30	0.00	0.00	0.00	155.71	155.71	71.70	29.75	13.80	0.41	0.00	156.12	202.42
		11-20	72.54	72.68	296.80	300.40	3.60	0.00	0.00	0.00	969.41	969.41	72.62	31.60	2.30	0.07	0.00	969.48	973.08
		21-30	72.68	74.76	300.40	365.80	65.40	0.00	0.00	0.00	108.15	108.15	73.73	33.81	13.30	0.45	0.00	108.60	174.00
	Sept	1-10	74.76	77.13	365.80	452.20	86.40	0.00	0.00	0.00	803.38	803.38	75.95	38.61	12.90	0.50	0.00	803.88	890.28
		11-20	77.13	79.02	452.20	529.00	76.80	0.00	0.00	0.00	0.00	0.00	78.08	43.69	39.00	1.70	0.00	170	78.50
		21-31	79.02	79.49	529.00	549.50	20.50	3.07	0.06	0.00	0.00	3.13	79.28	46.54	49.90	2.33	0.00	5.46	25.96
	Oct	1-10	79.49	79.71	549.50	560.40	10.90	4.26	0.15	0.00	0.00	4.40	79.60	47.51	42.80	2.00	0.00	6.44	17.34
		11-20	79.71	79.76	560.40	562.40	2.00	2.39	1.22	0.00	0.00	3.61	79.74	47.85	38.80	1.86	0.00	5.47	7.47
		21-30	79.76	79.76	562.40	562.40	0.00	2.84	0.12	0.00	0.00	2.95	79.75	47.90	44.40	2.13	0.00	5.08	5.08
	Nov.	1-10	79.76	79.88	562.40	559.00	-3.40	0.62	0.15	0.00	0.00	0.78	79.72	47.80	44.80	2.14	0.50	3.40	0.00
		11-20	79.88	79.29	559.00	540.80	-18.40	12.72	0.29	0.00	0.00	13.01	79.49	47.21	41.80	1.97	3.41	18.40	0.00
		21-31	79.29	79.20	540.80	537.00	-3.80	4.16	0.09	0.00	0.00	4.25	79.25	46.61	45.50	2.12	0.00	6.37	2.77
	Dec.	1-10	79.20	78.98	537.00	527.20	-8.80	8.92	0.17	0.00	0.00	9.10	78.09	46.22	44.50	2.06	0.00	11.15	1.35
		11-20	78.98	78.84	527.20	521.80	-5.60	5.90	0.20	0.00	0.00	6.10	78.81	45.77	38.70	1.77	0.00	7.87	2.27
		21-31	78.84	78.68	521.80	515.20	-6.40	4.04	0.06	0.00	0.00	4.09	78.76	45.40	39.00	1.77	0.54	6.40	0.00
	Jan.	1-10	78.68	78.40	515.20	504.50	-10.70	11.11	0.26	0.00	0.00	11.40	78.54	44.85	43.10	1.93	0.00	13.33	2.63
		11-20	78.40	78.36	504.50	502.40	-2.10	0.39	0.03	0.00	0.00	0.42	78.38	44.45	36.90	1.64	0.00	2.06	-0.04
		21-28	78.36	78.04	502.40	489.80	-12.80	11.03	0.25	0.00	0.00	11.28	78.20	43.95	40.90	1.80	0.00	13.08	0.28
	Feb.	1-10	78.04	77.87	489.80	482.80	-6.80	3.95	0.14	0.00	0.00	4.10	77.96	43.34	52.40	2.27	0.43	6.80	0.00
		11-20	77.87	77.66	482.80	473.00	-9.80	4.78	0.18	0.00	0.00	4.95	77.77	42.91	59.30	2.54	2.30	9.80	0.00
		21-31	77.66	77.38	473.00	462.20	-10.80	9.43	0.34	0.00	0.00	9.77	77.52	42.30	38.60	1.63	0.00	11.40	0.60
	March	1-10	77.38	77.27	462.20	457.80	-4.40	1.89	0.05	0.00	0.00	1.94	77.33	41.81	54.90	2.30	0.16	4.40	0.00
		11-20	77.27	77.89	457.80	442.50	-15.30	12.73	0.29	0.00	0.00	13.02	77.58	41.20	58.60	2.41	0.00	15.43	0.13
		21-30	77.89	76.69	442.50	434.70	-7.80	3.97	0.08	0.00	0.00	4.05	77.29	40.47	66.60	2.70	1.06	7.80	0.00
	April	1-10	76.69	75.33	434.70	421.20	-13.50	10.72	0.21	0.00	0.00	10.93	76.51	38.77	62.50	2.49	0.09	13.50	0.00
		11-20	75.33	75.13	421.20	413.20	-8.00	4.09	0.76	0.00	0.00	4.85	75.23	38.09	66.00	2.58	1.26	8.84	0.88
		21-31	75.13	65.52	413.20	152.40	-260.80	13.32	0.29	0.00	273.23	286.84	71.33	29.09	68.10	2.01	0.00	288.85	28.05
	May	1-10	65.52	65.57	152.40	133.40	-19.00	5.00	0.07	9.68	0.00	14.74	66.05	18.48	67.70	1.25	3.01	19.00	0.00
		11-20	65.57	64.66	133.40	116.20	-17.20	12.82	0.26	0.00	0.00	13.10	65.12	16.87	64.60	1.09	3.01	17.20	0.00
		21-30	64.66	64.24	116.20	108.80	-7.40	4.94	0.11	0.00	0.00	5.04	64.45	15.82	72.10	1.14	1.22	7.40	0.00
							-104.50	182.84	6.49	12.88	2356.44	2567.66				57.44		2642.08	2537.48





Year	Month	Period date	Reservoir level		Reservoir capacity		Reservoir capacity difference Col. 7 - Col. 6	Water Released through (M.cum.)			Spillover Quantity through (M.Cum.)	Total releases (M.cum.)	Average reservoir level during period (m) (Col. 4+5)	Average reservoir area corresponding to Ave. level	Evaporation depth in mm.	Evaporation losses in Col. 15x16 /1000	Other losses	Total Outflow	In flow	
			at beginning of period	at end of period	at beginning	at end		RBHR	LBHR	BPO										
1993	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	June	1-10	54.24	63.68	108.80	99.60	-9.20	8.32	0.17	0.00	0.00	8.49	63.96	14.90	62.20	0.93	0.00	9.41	0.21	
		11-20	63.68	66.35	99.60	149.00	49.40	0.00	0.00	0.74	43.05	65.02	65.02	16.75	22.00	0.37	0.00	44.16	93.56	
		21-31	66.35	66.22	149.00	145.60	-3.40	0.00	0.00	0.00	67.08	87.09	86.29	18.91	36.50	0.69	0.00	87.78	84.36	
	July	1-10	66.22	67.91	145.60	182.20	36.60	0.12	0.00	0.00	166.41	166.53	67.07	20.31	16.30	0.33	0.00	166.86	203.46	
		11-20	67.91	67.32	182.20	176.40	-5.80	0.00	0.00	0.00	1206.01	1206.01	67.62	21.65	6.00	0.13	0.00	1206.14	1200.34	
		21-31	67.32	70.65	176.40	245.50	69.10	0.70	0.00	0.00	187.49	188.19	68.99	24.48	16.20	0.40	0.00	188.59	257.69	
	Aug	1-10	70.65	72.68	245.50	300.40	54.90	0.00	0.00	0.00	109.65	109.65	71.67	29.62	12.40	0.37	0.00	110.02	164.92	
		11-20	72.68	76.16	300.40	414.40	114.00	0.00	0.02	0.00	91.51	91.53	74.42	35.32	10.90	0.38	0.00	91.91	205.81	
		21-30	76.16	76.35	414.40	422.00	7.60	0.00	0.01	0.00	203.95	203.96	76.26	39.15	17.60	0.69	0.00	204.65	212.25	
	Sept.	1-10	76.35	79.51	422.00	550.50	128.50	0.00	0.00	0.00	87.71	87.71	77.93	43.32	9.40	0.41	0.00	88.12	226.62	
		11-20	79.51	79.68	550.50	559.00	8.50	0.00	0.00	0.00	166.15	166.15	79.60	47.48	18.00	0.85	0.00	167.00	175.50	
21-31		79.68	79.51	559.00	550.50	-8.50	0.00	0.00	0.00	718.99	718.99	79.60	47.48	8.70	0.41	0.00	719.40	710.90		
Oct.	1-10	79.51	79.74	550.50	561.60	11.10	0.00	0.00	0.00	163.44	163.44	78.63	47.56	41.20	1.96	0.00	165.40	176.50		
	11-20	79.74	79.81	561.60	564.40	2.80	0.00	0.00	0.00	105.26	105.26	79.78	47.94	26.20	1.26	0.00	106.52	109.32		
	21-30	79.81	79.84	564.40	565.60	1.20	0.00	0.00	0.00	120.76	120.76	79.83	48.09	39.10	1.89	0.00	122.64	123.84		
Nov.	1-10	79.84	79.75	565.60	562.00	-3.60	0.86	0.00	0.00	58.20	59.06	79.80	48.01	40.60	1.95	0.00	61.01	57.41		
	11-20	79.75	79.75	562.00	561.20	-0.80	0.50	0.00	0.00	25.35	25.85	79.75	47.85	42.80	2.05	0.00	27.90	27.10		
	21-31	79.75	79.62	561.20	556.00	-5.20	6.64	0.13	0.00	0.00	6.77	79.69	47.68	33.90	1.62	0.00	8.39	3.19		
Dec.	1-10	79.62	79.96	556.00	553.00	-3.00	1.99	0.19	0.00	0.00	2.17	79.59	47.47	39.80	1.89	0.00	4.06	1.06		
	11-20	79.96	79.39	553.00	544.60	-8.40	6.44	0.24	0.00	0.00	6.68	79.48	47.19	38.50	1.82	0.00	6.48	0.09		
	21-31	79.39	79.38	544.60	537.80	-6.80	6.36	0.06	0.00	0.00	6.45	79.31	46.76	48.20	2.25	0.00	8.71	1.91		
Jan.	1-10	79.22	78.99	537.80	527.80	-10.00	8.30	0.03	0.00	0.00	0.61	79.11	46.20	47.00	1.94	0.00	10.55	0.35		
	11-20	78.99	78.99	527.80	524.00	-3.80	3.09	0.07	0.00	0.00	3.17	78.95	45.86	26.40	1.21	0.00	4.38	0.78		
	21-28	78.90	78.57	524.00	510.80	-13.20	10.40	0.33	0.00	0.00	10.73	78.74	45.34	43.70	1.96	0.49	13.20	0.00		
Feb.	1-10	78.57	78.44	510.80	505.60	-5.20	3.80	0.04	0.00	0.00	3.83	78.51	44.76	38.30	1.71	0.00	5.55	0.35		
	11-20	78.44	76.24	505.60	495.40	-10.20	4.65	0.16	0.00	0.00	4.80	78.34	44.35	42.30	1.96	3.53	10.20	0.00		
	21-31	78.24	77.95	495.40	486.00	-9.40	9.67	0.30	0.00	0.00	9.98	78.10	43.74	37.50	1.64	0.00	11.80	2.20		
March	1-10	77.95	77.71	486.00	475.40	-10.60	4.28	0.07	0.00	0.00	4.35	77.63	43.08	53.40	2.30	3.94	10.60	0.00		
	11-20	77.71	77.34	475.40	460.60	-14.80	12.12	0.35	0.00	0.00	12.47	77.53	42.31	57.90	2.45	0.00	14.92	0.12		
	21-30	77.34	77.08	460.60	450.20	-10.40	5.94	0.14	0.00	0.00	6.07	77.21	41.52	69.00	2.88	1.46	10.40	0.00		
April	1-10	77.09	76.66	450.20	433.80	-16.40	12.48	0.41	0.00	0.00	12.69	76.87	40.67	65.40	2.66	0.85	16.40	0.00		
	11-20	76.66	76.42	433.80	424.80	-9.00	4.80	0.16	0.00	0.00	5.05	76.64	39.85	65.40	2.65	1.30	9.00	0.00		
	21-31	76.42	75.91	424.80	404.30	-20.50	14.01	0.27	0.00	0.00	14.28	75.17	38.98	66.00	2.57	3.65	20.50	0.00		
May	1-10	75.91	75.55	404.30	387.50	-16.80	10.76	0.13	0.00	0.00	10.86	75.73	38.05	60.80	2.54	0.00	13.23	1.03		
	11-20	75.55	70.29	387.50	235.80	-152.70	13.95	0.36	0.00	0.00	13.92	72.92	32.18	66.30	2.12	15.29	156.70	0.00		
	21-30	70.29	65.65	235.80	135.00	-100.80	11.99	0.40	0.00	0.00	11.83	67.97	22.23	66.10	1.47	0.00	119.99	19.16		
								162.64	4.83	0.74	3782.13	3948.44				54.53		4034.58	4086.78	



Year	Month	Period date	Reservoir level		Reservoir capacity		Reservoir capacity Difference Col. 7 - Col. 6	Water Released through			Spillover Quantity through (M.Cum.)	Total releases (M.Cum)	Average reservoir level during period (m) (Col. 4+5)	Average reservoir area corresponding to Ave. level	Evaporation depth in mm.	Evaporation losses Mm. Col. 15x16 /1000	Other losses	Total Outflow	In flow
			at beginning of period	at end of period	at beginning	at end		RBHR	LBHR	BPO									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1994	June	1-10	65.65	64.83	135.00	118.60	-16.40	13.89	0.00	0.00	0.00	13.45	65.24	17.07	59.70	1.02	1.93	16.40	0.00
		11-20	64.83	65.57	118.60	113.40	-5.20	1.47	0.00	0.00	198.30	65.20	16.99	15.20	0.26	0.00	200.10	194.90	
		21-31	65.57	68.30	113.40	191.40	77.60	0.00	0.00	0.00	451.52	66.94	20.16	3.90	0.08	0.00	461.60	529.20	
	July	1-10	68.30	67.28	191.40	196.40	5.40	0.00	0.00	0.00	369.81	67.79	21.68	8.20	0.16	0.00	369.99	375.39	
		11-20	67.28	72.77	196.40	303.10	106.70	0.00	0.00	0.00	1284.73	70.03	26.27	3.30	0.09	0.00	1284.82	1391.52	
		21-31	72.77	73.16	303.10	314.80	11.70	0.00	0.00	0.00	639.80	72.97	32.30	5.70	0.18	0.00	639.98	651.68	
	Aug	1-10	73.16	74.10	314.80	345.00	30.20	0.00	0.00	0.00	138.50	73.63	33.68	6.60	0.22	0.00	138.72	168.92	
		11-20	74.10	74.03	345.00	342.90	-2.10	0.00	0.00	0.00	338.48	74.07	34.53	6.60	0.23	0.00	339.71	337.61	
		21-30	74.03	74.54	342.90	359.20	16.30	0.00	0.00	0.00	801.92	74.29	34.93	3.30	0.12	0.00	802.04	818.34	
	Sept.	1-10	74.54	76.94	359.20	444.60	85.40	0.00	0.00	0.00	593.28	75.74	38.13	4.50	0.17	0.00	593.45	678.85	
		11-20	76.94	78.78	444.60	523.20	78.60	0.00	0.00	0.00	130.02	77.86	43.27	18.40	0.80	0.00	130.82	209.42	
		21-31	78.78	79.46	523.20	548.00	24.80	0.00	0.00	0.00	27.27	79.12	46.42	38.30	1.76	0.00	29.05	53.85	
	Oct.	1-10	79.46	79.69	548.00	559.50	11.50	1.13	0.00	0.00	1.29	79.58	47.44	46.20	2.19	0.00	3.48	14.98	
		11-20	79.69	79.74	559.50	561.60	2.10	4.71	0.00	0.00	4.78	79.72	47.79	16.10	0.77	0.00	5.55	7.65	
		21-30	79.74	79.60	561.60	559.50	-2.10	8.89	0.00	0.00	8.90	79.57	47.79	52.00	2.48	0.00	11.39	9.29	
	Nov.	1-10	79.60	79.59	559.50	554.50	-5.00	4.80	0.00	0.00	5.01	79.60	47.60	54.10	2.58	0.00	7.59	2.59	
		11-20	79.59	79.41	554.50	545.50	-9.00	11.87	0.00	0.00	12.08	79.50	47.25	53.70	2.54	0.00	14.61	5.61	
		21-31	79.41	79.24	545.50	538.60	-6.90	8.20	0.00	0.00	8.48	79.33	46.81	43.90	2.05	0.00	10.55	3.65	
	Dec.	1-10	79.24	79.08	538.60	531.00	-7.60	7.47	0.00	0.00	7.61	79.15	46.37	47.80	2.21	0.00	9.82	2.22	
		11-20	79.08	79.91	531.00	524.40	-6.60	5.77	0.00	0.00	5.95	79.49	45.96	45.00	2.07	0.00	8.01	1.41	
		21-31	79.91	79.74	524.40	517.60	-6.80	5.75	0.00	0.00	5.93	79.83	45.56	55.30	2.52	0.00	8.45	1.65	
1995	Jan.	1-10	79.74	78.47	517.60	506.80	-10.80	9.73	0.00	0.00	10.02	79.11	45.01	36.60	1.65	0.00	11.67	0.87	
		11-20	78.47	78.35	506.80	502.00	-4.80	4.77	0.00	0.00	4.83	78.41	44.53	44.00	1.96	0.00	6.79	1.99	
		21-28	78.35	79.06	502.00	409.00	-93.00	9.16	0.00	0.00	9.44	78.71	44.00	40.40	2.17	0.00	11.61	-81.39	
	Feb.	1-10	79.06	77.94	409.00	485.60	76.60	4.20	0.00	0.00	4.26	78.50	43.48	53.70	2.34	0.00	6.59	83.19	
		11-20	77.94	77.78	485.60	479.60	-6.00	4.49	0.00	0.00	4.71	77.86	43.15	52.20	2.25	0.00	6.96	0.16	
		21-31	77.78	77.44	479.60	464.20	-15.40	9.79	0.00	0.00	9.99	77.61	42.52	43.20	1.84	0.00	11.83	-2.77	
	March	1-10	77.44	77.25	464.20	467.00	2.80	5.05	0.00	0.00	6.14	77.35	41.86	45.60	2.05	0.00	8.22	1.02	
		11-20	77.25	76.67	467.00	441.50	-25.50	13.73	0.00	0.00	12.95	77.05	41.15	59.00	2.32	0.00	15.26	-0.24	
		21-30	76.67	75.74	441.50	435.20	-6.30	7.77	0.00	0.00	2.75	76.81	40.51	90.90	2.67	0.00	6.22	-0.06	
	April	1-10	75.74	76.37	435.20	422.50	-12.70	13.11	0.00	0.00	10.24	76.65	39.82	62.50	2.31	0.00	12.62	-0.78	
		11-20	76.37	75.94	422.50	426.50	4.00	13.11	0.00	0.00	10.24	76.65	39.82	62.50	2.31	0.00	12.62	-0.78	
		21-31	75.94	76.37	426.50	422.50	-4.00	13.11	0.00	0.00	10.24	76.65	39.82	62.50	2.31	0.00	12.62	-0.78	
	May	1-10	76.37	76.37	422.50	422.50	0.00	13.11	0.00	0.00	10.24	76.65	39.82	62.50	2.31	0.00	12.62	-0.78	
		11-20	76.37	76.37	422.50	422.50	0.00	13.11	0.00	0.00	10.24	76.65	39.82	62.50	2.31	0.00	12.62	-0.78	
		21-31	76.37	76.37	422.50	422.50	0.00	13.11	0.00	0.00	10.24	76.65	39.82	62.50	2.31	0.00	12.62	-0.78	
		Total																507.25	1248.95

Year	Month	Period date	Reservoir level		Reservoir capacity		Reservoir capacity Difference Col. 7 - Col. 6	Water Released through (M.cum)			Spillway quantity through (M.Cum.)	Total releases (M.cum)	Average reservoir level during period (m) (Col. 4+5)	Average reservoir level corresponding to Ave. level (m)	Evaporation depth in mm.	Evaporation losses Min Col. 15x16 /1000	Other losses	Total Outflow	In flow
			at beginning of period	at end of period	at beginning	at end		RBHR	LBHR	BPO									
1995	June	1-10	65.13	64.07	125.60	106.40	-19.20	13.12	0.00	0.00	0.00	13.12	64.60	15.97	62.40	1.00	0.00	14.12	-5.08
		11-20	64.07	63.59	108.40	97.80	-8.60	8.40	0.00	0.00	0.00	8.40	63.83	14.87	50.20	0.74	0.00	9.13	0.53
		21-31	63.59	62.72	97.80	89.20	-14.60	9.72	0.05	0.00	0.00	9.77	63.16	13.72	46.50	0.64	0.00	10.40	-4.20
	July	1-10	62.72	62.05	89.20	72.50	-10.70	10.16	0.17	0.00	0.00	10.32	62.39	12.57	35.90	0.45	0.00	10.78	0.08
		11-20	62.05	61.85	72.50	198.50	126.00	2.39	0.00	0.00	0.00	133.69	85.35	17.68	6.30	0.11	0.00	136.19	262.19
		21-31	61.85	72.60	198.50	268.00	88.50	0.00	0.00	0.00	0.00	437.95	70.53	27.19	7.40	0.20	0.00	437.55	537.05
	Aug	1-10	72.60	73.00	268.00	310.00	42.00	0.00	0.00	0.00	0.00	227.82	72.80	32.00	11.50	0.38	0.00	228.20	240.20
		11-20	73.00	74.30	310.00	361.00	51.00	0.00	0.00	0.00	0.00	14.85	73.65	33.70	26.80	0.90	0.00	15.75	56.75
		21-30	74.30	76.80	361.00	438.00	77.00	2.20	0.00	0.00	0.00	0.00	75.55	37.75	22.00	0.83	0.00	3.03	90.03
	Sept	1-10	76.80	77.25	438.00	457.00	19.00	0.00	0.00	0.00	0.00	311.57	77.03	41.07	40.80	1.68	0.00	313.25	332.25
		11-20	77.25	78.50	457.00	508.00	51.00	2.20	0.03	0.00	0.00	52.79	77.88	43.19	35.20	1.52	0.00	56.54	107.54
		21-31	78.50	78.75	508.00	518.00	10.00	11.50	0.17	0.00	0.00	6.15	78.63	45.07	23.40	1.05	0.00	18.88	28.88
	Oct.	1-10	78.75	79.15	518.00	535.00	17.00	3.42	0.00	0.00	0.00	3.42	78.95	45.88	38.80	1.83	0.00	5.25	22.25
		11-20	79.15	79.35	535.00	543.00	8.00	13.24	0.24	0.00	0.00	13.48	79.25	46.83	36.50	1.70	0.00	15.18	23.18
		21-30	79.35	79.65	543.00	552.00	9.00	0.00	0.29	0.00	0.00	0.29	79.45	47.09	50.70	2.39	0.00	19.32	-0.18
	Nov.	1-10	79.65	79.10	552.00	533.00	-19.50	15.84	0.15	0.00	0.00	15.98	79.33	46.82	35.70	1.67	1.67	11.45	4.45
		11-20	79.10	78.95	533.00	526.00	-7.00	8.42	0.22	0.00	0.00	9.64	79.03	46.07	39.10	1.80	0.00	10.79	2.79
		21-31	78.95	78.75	526.00	518.00	-8.00	8.82	0.33	0.00	0.00	8.15	78.85	45.63	35.90	1.64	0.00	15.96	3.96
	Dec.	1-10	78.75	78.45	518.00	505.00	-12.00	14.32	0.03	0.00	0.00	14.35	78.60	45.01	36.20	1.53	0.00	19.77	-0.23
		11-20	78.45	78.45	505.00	505.00	0.00	0.56	0.32	0.00	0.00	0.88	78.45	44.53	39.30	1.75	0.00	2.64	2.64
		21-31	78.45	79.85	505.00	486.00	-20.00	15.07	0.09	0.00	0.00	15.16	78.20	44.01	41.20	1.81	2.79	18.94	1.94
1996	Jan.	1-10	79.85	77.80	486.00	480.00	-8.00	6.24	0.15	0.00	0.00	6.39	78.88	43.19	37.60	1.62	0.00	8.01	2.01
		11-20	77.80	77.60	480.00	470.00	-10.00	6.36	0.32	0.00	0.00	6.68	77.70	42.75	37.50	1.80	1.89	10.17	0.17
		21-28	77.60	77.15	470.00	453.00	-17.00	17.13	0.00	0.00	0.00	17.13	77.38	41.94	43.20	1.81	0.00	18.94	1.94
	Feb.	1-10	77.15	77.05	453.00	448.00	-5.00	3.18	0.46	0.00	0.00	3.64	77.10	41.26	41.30	1.70	0.00	5.34	1.34
		11-20	77.05	76.85	448.00	440.50	-8.50	6.00	0.26	0.00	0.00	6.26	76.95	40.88	45.70	1.87	0.49	8.62	0.12
		21-31	76.85	76.35	440.50	422.00	-18.50	15.76	0.12	0.00	0.00	15.88	76.80	40.01	40.80	1.83	0.85	16.36	-0.14
	March	1-10	76.35	76.20	422.00	418.00	-4.00	7.24	0.00	0.00	0.00	7.24	76.28	38.19	54.80	2.15	0.00	9.39	3.39
		11-20	76.20	76.85	418.00	405.00	-11.00	7.34	0.28	0.00	0.00	7.53	76.08	38.75	52.50	2.03	1.13	10.78	-0.21
		21-30	76.85	75.25	405.00	382.00	-23.00	20.32	0.23	0.00	0.00	20.55	75.60	37.75	60.20	2.50	0.40	23.45	-0.45
	April	1-10	75.25	74.85	382.00	369.00	-13.00	14.81	0.00	0.00	0.00	14.81	75.05	36.55	64.60	2.36	0.00	17.17	4.17
		11-20	74.85	74.55	369.00	359.50	-9.50	5.14	0.17	0.00	0.00	5.31	74.70	36.77	57.80	2.07	2.30	8.67	0.17
		21-31	74.55	74.85	359.50	338.00	-21.50	18.35	0.20	0.00	0.00	18.55	74.23	34.82	61.80	2.16	0.82	21.53	0.03
	May	1-10	74.85	73.90	338.00	328.00	-10.00	11.75	0.00	0.00	0.00	11.75	73.70	33.80	64.10	2.17	0.00	13.91	0.91
		11-20	73.90	73.30	328.00	318.00	-6.00	5.38	0.00	0.00	0.00	5.38	73.40	33.20	61.30	2.04	0.00	7.42	1.42
		21-30	73.30	72.65	318.00	296.50	-21.50	19.32	0.32	0.00	0.00	19.64	72.98	32.34	67.20	2.17	0.00	21.82	2.32
												1184.22	1493.62			55.60		1861.45	1795.35
								304.70	4.80	0.00	0.00								



Year	Month	Period date	Reservoir level		Reservoir capacity		Reservoir capacity difference Col. 7 - Col. 6	Water Released through (M.Cum.)			Spillway Quantity through (M.Cum.)	Total releases (M.Cum.)	Average reservoir level during period (m) (Cal. 4+5)	Average reservoir area corresponding to Ave. level (sq to Ave. level)	Evaporation depth in mm.	Evaporation losses Mm/ Cal. 15+16 1000	Other losses	Total Outflow	Inflow
			at beginning of period	at end of period	at beginning	at end		RBHR	LBHR	SPO									
1996	2	5	4	5	7	7	8	3	16	11	12	13	14	15	16	17	18	19	20
	June	1-10	72.65	72.15	285.50	285.50	-14.00	17.99	0.51	0.00	0.00	18.60	72.40	31.20	62.20	1.94	2.35	22.89	8.88
		11-20	71.15	69.75	285.50	222.00	-63.50	10.65	0.37	0.00	107.81	118.82	70.95	28.37	24.70	0.70	0.03	119.55	56.05
		21-31	69.75	66.15	222.00	144.50	-77.50	7.93	0.00	0.00	127.25	135.08	67.95	21.77	26.20	0.57	0.02	135.57	58.17
	July	1-10	66.15	65.90	144.50	140.00	-4.50	9.79	0.31	0.00	32.60	42.70	66.03	18.40	26.00	0.46	0.01	43.18	38.68
		11-20	65.90	66.80	140.00	157.00	17.00	9.10	3.61	0.00	0.00	9.71	67.35	18.00	14.10	0.27	0.01	9.96	26.99
		21-31	66.80	73.40	157.00	322.00	165.00	0.00	0.00	0.00	383.24	383.24	71.10	7.00	3.00	0.02	0.01	383.27	548.27
	Aug	1-10	73.40	74.55	322.00	359.50	37.50	0.00	0.00	0.00	417.68	417.68	73.98	26.25	5.90	0.15	0.02	417.67	455.37
		11-20	74.55	74.50	359.50	358.00	-1.50	0.00	0.00	0.00	267.62	267.62	74.53	34.30	8.00	0.27	0.01	267.90	266.40
		21-30	74.50	76.70	358.00	435.00	77.00	0.00	0.00	0.00	367.56	367.56	75.60	35.38	11.10	0.39	0.01	367.96	444.95
	Sept.	1-10	76.70	78.35	435.00	502.00	67.00	0.00	0.00	0.00	363.84	363.84	77.53	37.80	14.50	0.55	0.02	384.41	451.41
		11-20	71.35	78.65	502.00	514.00	12.00	0.00	0.00	0.00	186.87	186.87	78.50	42.31	21.70	0.92	0.02	186.51	201.61
		21-31	76.65	79.70	514.00	580.00	66.00	0.00	0.00	0.00	0.00	0.00	79.16	44.75	34.00	1.52	0.02	1.54	47.54
	Oct.	1-10	79.70	79.50	580.00	550.00	-30.00	0.28	0.49	0.00	74.00	74.78	78.60	45.44	27.30	1.27	0.02	76.07	66.07
		11-20	79.50	79.70	550.00	560.00	10.00	0.88	0.12	0.00	0.00	1.00	79.60	47.50	43.98	2.59	0.02	3.11	13.11
		21-30	79.70	79.55	560.00	552.00	-8.00	0.00	0.00	0.00	142.60	142.60	79.53	47.50	48.50	2.35	0.02	144.97	136.97
	Nov.	1-10	79.55	79.55	552.00	552.00	0.00	4.85	0.00	0.00	0.00	4.65	79.55	47.56	38.40	1.83	1.90	8.38	6.38
		11-20	79.55	79.35	552.00	543.00	-9.00	8.57	0.06	0.00	0.00	8.63	78.45	47.38	37.70	1.79	3.87	14.28	5.20
		21-31	79.35	79.10	543.00	533.00	-10.00	7.47	0.61	0.00	0.00	8.08	78.23	14.13	38.20	0.54	4.45	13.07	3.07
	Dec.	1-10	79.10	78.45	533.00	522.00	-11.00	13.03	0.61	0.00	0.00	13.64	78.78	46.56	32.70	1.52	3.34	18.51	7.51
		11-20	78.45	78.60	522.00	512.00	-10.00	9.54	0.43	0.00	0.00	9.97	78.53	45.94	37.70	1.73	2.52	14.22	4.22
		21-31	78.60	78.60	512.00	512.00	0.00	0.00	0.00	0.00	0.00	0.00	78.50	45.31	47.50	2.15	0.02	2.17	2.17
	Jan.	1-10	78.60	78.30	512.00	500.00	-12.00	12.42	0.25	0.00	0.00	12.65	78.45	45.00	35.20	1.58	2.06	16.30	4.30
		11-20	78.30	78.00	500.00	488.00	-12.00	12.31	0.49	0.00	0.00	12.80	78.15	44.62	40.30	1.80	4.14	18.74	6.74
		21-28	78.00	77.75	488.00	477.00	-11.00	6.63	0.54	0.00	0.00	7.17	77.88	43.87	48.30	2.12	6.60	15.88	4.88
	Feb.	1-10	77.75	77.60	477.00	470.00	-7.00	4.11	0.00	0.00	0.00	4.11	77.68	43.19	40.20	1.74	4.38	10.23	3.23
		11-20	77.60	77.45	470.00	464.50	-5.50	7.27	0.10	0.00	0.00	7.36	77.53	42.59	47.00	2.01	2.28	11.65	6.15
		21-31	77.45	77.20	464.50	456.00	-8.50	9.83	0.19	0.00	0.00	10.02	77.33	42.31	43.00	1.82	2.22	14.06	4.56
	March	1-10	77.20	76.75	456.00	436.50	-19.50	15.59	0.24	0.00	0.00	15.83	76.98	41.81	52.00	2.17	4.75	22.75	4.25
		11-20	76.75	77.65	436.50	433.50	-3.00	2.20	0.24	0.00	0.00	2.44	77.20	40.94	50.00	2.05	1.10	5.59	2.59
		21-20	77.65	78.30	433.50	420.00	-13.50	13.10	0.12	0.00	0.00	13.22	76.98	40.25	52.00	2.08	1.18	15.48	2.98
	April	1-10	78.30	75.75	420.00	398.50	-21.50	18.36	0.45	0.00	0.00	18.85	76.03	39.69	50.70	2.01	2.90	23.76	2.26
		11-20	75.75	75.35	398.50	385.50	-13.00	8.46	0.20	0.00	0.00	8.84	75.96	38.87	60.00	2.32	4.25	18.50	2.21
		21-31	75.35	74.95	385.50	372.50	-13.00	15.74	0.44	0.00	0.00	16.18	75.15	37.66	63.70	2.10	0.02	18.50	5.30
	May	1-10	74.95	74.20	372.50	384.00	11.50	18.35	0.46	0.00	0.00	18.84	74.68	36.55	57.90	2.06	4.13	25.03	36.53
		11-20	74.20	74.20	384.00	411.00	27.00	0.00	0.00	0.00	245.70	258.79	70.08	28.55	54.70	1.45	0.94	261.19	18.19
		21-30	65.85	65.83	411.00	138.60	-272.40	1.84	0.54	0.00	2.73	5.10	65.89	18.18	68.90	1.26	0.02	8.39	3.99
								258.59	9.02		2741.31	3008.21				51.03		3120.21	2958.31



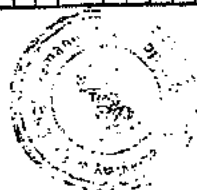
Year	Month	Period date	Reservoir level		Reservoir capacity		Reservoir capacity Difference Col. 7 - Col. 6	Water Released through (M.Cum.)			Spill over Quantity through (M.Cum.)	Total releases (M.Cum.)	Average reservoir level during period (m) (Col. 4+5)	Average reservoir area corresponding to Ave. level	Evaporation depth in mm.	Evaporation losses Mm <sup>2</sup> Col. 15x16 /1000	Other losses	Total Outflow	In flow				
			at beginning of period	at end of period	at beginning	at end		RBHR	LBHR	BPO													
1997	June	1-10	65.83	65.25	138.60	128.00	-10.60	10.40	0.49	0.00	0.00	10.89	65.54	17.58	40.90	0.72	0.03	11.64	1.04				
		11-20	65.25	64.80	118.00	118.00	-10.00	11.92	0.39	0.00	0.00	12.31	65.03	16.70	26.00	0.47	0.01	12.79	2.79				
		21-30	64.8	64.15	118.00	144.50	26.50	0.86	0.00	0.00	25.56	26.42	65.48	17.46	13.10	0.23	0.00	26.65	53.15				
	July	1-10	66.15	66.40	144.50	150.00	5.50	6.00	0.42	0.00	82.28	88.70	66.28	18.91	17.10	0.32	0.01	89.03	94.53				
		11-20	66.4	65.95	150.00	141.00	-8.00	6.76	0.27	0.00	51.83	58.96	66.18	16.75	16.90	0.32	0.01	59.26	50.28				
		21-31	65.95	73.10	141.00	313.00	172.00	8.32	0.31	0.00	612.83	521.46	69.53	25.45	12.40	0.32	0.00	521.78	583.78				
1998	Aug	1-10	73.1	73.10	313.00	293.00	-20.00	0.00	0.00	0.00	578.61	578.61	73.10	31.90	11.20	0.36	0.00	578.61	558.97				
		11-20	73.1	75.95	293.00	365.00	102.00	1.70	0.37	0.00	86.16	70.23	74.53	34.85	15.10	0.53	0.01	70.77	172.77				
		21-30	75.95	75.85	395.00	402.00	7.00	1.42	0.27	0.00	787.52	769.23	75.80	38.40	12.60	0.48	0.01	768.70	776.70				
	Sept.	1-10	75.85	74.90	402.00	371.00	-31.00	0.73	0.00	0.00	121.43	122.16	75.38	37.25	24.70	0.92	0.02	123.10	92.10				
		11-20	74.9	75.75	371.00	398.50	27.50	1.18	0.41	0.00	0.00	1.59	75.33	37.15	24.10	0.90	0.02	2.50	30.00				
		21-30	75.75	77.75	398.50	477.00	78.50	0.41	0.28	0.00	0.00	0.68	76.75	40.48	22.20	0.90	0.02	1.80	80.10				
1999	Oct.	1-10	77.75	78.45	477.00	506.00	29.00	1.29	0.00	0.00	0.00	1.28	78.10	43.74	38.70	1.69	0.07	3.05	32.05				
		11-20	78.45	78.70	506.00	516.00	10.00	2.17	0.22	0.00	0.00	2.38	78.58	44.93	34.30	1.54	0.05	3.88	13.88				
		21-31	78.7	78.70	516.00	516.00	0.00	8.94	0.37	0.00	0.00	9.31	78.70	45.25	46.60	2.11	0.10	11.52	11.52				
	Nov.	1-10	78.7	78.78	516.00	516.00	0.00	3.83	0.13	0.00	0.00	3.96	78.74	45.31	41.50	1.88	0.08	5.93	7.93				
		11-20	78.78	78.50	516.00	508.00	-10.00	15.71	0.49	0.00	0.00	16.20	78.64	45.06	33.80	1.52	0.05	17.77	7.77				
		21-30	78.5	78.50	508.00	508.00	0.00	3.41	0.08	0.00	0.00	3.50	78.50	44.75	29.10	1.30	0.04	4.84	4.84				
2000	Dec.	1-10	78.5	78.30	508.00	500.00	-8.00	11.54	0.00	0.00	0.00	11.54	78.40	44.50	28.40	1.26	0.04	12.84	4.84				
		11-20	78.3	78.00	500.00	488.00	-12.00	12.76	0.00	0.00	0.00	12.76	78.15	43.87	28.30	1.24	0.04	14.03	2.03				
		21-30	78	77.50	488.00	484.00	-4.00	2.76	0.00	0.00	0.00	2.76	77.95	43.87	30.30	2.24	0.07	5.07	1.07				
	Jan.	1-10	77.9	77.45	484.00	454.50	-19.50	15.70	0.17	0.00	0.00	15.96	77.68	42.68	36.80	1.57	0.06	17.38	1.91				
		11-20	77.45	77.40	454.50	463.00	11.50	3.86	0.10	0.00	0.00	3.96	77.43	42.06	34.50	1.45	0.05	5.45	3.85				
		21-31	77.4	76.90	463.00	443.00	-20.00	46.29	0.00	0.00	0.00	618.29	77.15	41.37	41.10	1.70	0.07	618.06	598.06				
2001	Feb.	1-10	76.8	76.85	443.00	433.50	-9.50	7.78	0.27	0.00	0.00	8.04	76.78	40.43	51.20	2.07	0.11	10.22	0.72				
		11-20	76.85	76.45	433.50	428.00	-7.50	6.21	0.34	0.00	0.00	6.53	76.55	39.87	47.60	1.90	0.09	8.52	1.02				
		21-30	76.45	76.10	428.00	412.00	-16.00	9.75	0.00	0.00	0.00	9.75	76.28	39.21	38.20	1.50	0.08	11.30	2.70				
	March	1-10	76.1	75.70	412.00	387.00	-15.00	11.83	0.21	0.00	0.00	12.04	75.90	38.40	58.70	2.25	0.13	14.43	0.57				
		11-20	75.7	75.25	387.00	367.00	-15.00	15.86	0.12	0.00	0.00	16.07	75.48	37.50	60.90	2.28	0.14	18.50	3.50				
		21-30	75.25	74.80	367.00	357.00	-10.00	11.15	0.38	0.00	0.00	11.52	75.03	36.50	81.50	2.97	0.24	14.74	0.26				
2002	April	1-10	74.8	74.45	367.00	357.00	-10.00	9.63	0.00	0.00	0.00	8.63	74.63	35.63	76.80	2.74	0.21	12.58	2.58				
		11-20	74.45	73.75	357.00	337.00	-20.00	18.21	0.12	0.00	0.00	18.34	74.10	34.58	85.90	2.28	0.15	20.76	4.24				
		21-31	73.75	73.25	337.00	317.50	-19.50	15.26	0.49	0.00	0.00	15.76	73.60	33.40	64.80	2.16	0.14	18.04	3.54				
	May	1-10	73.25	72.90	317.50	307.00	-10.50	9.54	0.10	0.00	0.00	8.64	73.08	32.62	59.90	2.27	0.16	12.07	1.57				
		11-20	72.9	72.20	307.00	287.00	-20.00	18.35	0.37	0.00	0.00	18.72	72.55	31.42	68.80	2.18	0.15	21.07	1.07				
		21-30	72.2	71.45	287.00	265.00	-22.00	17.78	0.54	0.00	0.00	18.30	71.83	30.00	78.50	2.36	0.18	26.84	1.16				
									2208.32			3115.48			2.61			3115.09			3118.09		



Year	Month	Period date	Reservoir level		Reservoir capacity		Water Released through			Spillway Quantity through (M.Cum.)	Total losses (M.Cum.)	Average reservoir level during period (m) (Col. 14+5)	Average reservoir area corresponding to level (sq. km.)	Evaporation depth in mm.	Evaporation losses Mm <sup>2</sup> Col. 15x16 /1000	Other losses	Total Outflow	In flow
			at beginning of period	at end of period	at beginning	at end	RDHR	LDHR	BPO									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1998	June	1-10	71.45	71.05	255.00	255.00	-10.00	11.89	0.49	0.00	0.00	12.38	71.25	28.920	54.50	1.58	0.08	14.05
		11-20	71.05	67.40	255.00	172.00	-83.00	7.37	0.39	0.00	117.67	125.69	68.23	24.720	40.00	0.99	0.04	126.92
		21-30	67.4	65.95	172.00	141.00	-31.00	7.37	0.49	0.00	81.12	68.98	66.63	19.600	36.10	0.75	0.03	69.75
	July	1-10	65.85	65.75	141.00	136.50	15.50	0.69	0.10	0.00	281.13	281.81	66.35	19.000	11.10	0.21	0.00	262.13
		11-20	66.75	66.50	136.50	152.00	-4.50	2.20	0.49	0.00	164.64	167.33	66.63	19.500	20.50	0.40	0.01	167.74
		21-31	66.5	68.80	152.00	202.00	50.00	13.22	0.54	0.00	4.18	17.94	67.65	21.450	14.00	0.30	0.00	18.24
	Aug	1-10	68.8	74.50	202.00	338.00	136.00	-	0.47	0.00	56.30	56.77	71.65	29.470	11.90	0.35	0.00	57.12
		11-20	74.5	75.85	338.00	402.00	44.00	1.59	0.00	0.00	161.18	162.77	75.18	36.820	20.70	0.76	0.02	163.55
		21-30	75.85	78.10	402.00	492.00	90.00	9.47	0.00	0.00	77.80	86.53	76.98	41.020	25.00	1.06	0.03	87.62
	Sept.	1-10	78.1	78.30	492.00	500.00	8.00	-	0.00	0.00	305.35	305.35	78.20	44.000	18.10	0.84	0.02	306.21
		11-20	78.3	78.40	500.00	504.00	4.00	-	0.00	0.00	889.58	889.58	78.35	44.370	17.10	0.76	0.01	890.35
		21-30	78.4	79.30	504.00	541.60	37.00	-	0.00	0.00	103.25	108.25	78.85	45.620	30.90	1.41	0.04	109.70
	Oct.	1-10	79.3	79.85	541.60	565.00	23.00	-	0.00	0.00	87.14	87.14	79.58	47.460	37.20	1.77	0.07	88.97
		11-20	79.85	79.55	565.00	552.50	-13.50	-	0.00	0.00	104.04	104.04	78.70	47.770	38.90	1.86	0.07	105.97
		21-31	79.55	79.90	552.50	568.00	15.50	-	0.00	0.00	0.00	0.00	79.73	47.870	36.10	1.73	0.06	1.79
	Nov.	1-10	79.9	79.85	568.00	565.00	-2.00	-	0.00	0.00	28.11	28.11	79.88	48.270	34.10	1.65	0.06	29.81
		11-20	79.85	79.70	565.00	560.00	-5.00	2.94	0.00	0.00	13.22	16.16	79.78	47.960	37.00	1.77	0.07	18.00
		21-30	79.7	78.80	560.00	555.00	-5.00	6.71	0.32	0.00	0.00	7.04	79.65	47.620	45.00	2.19	0.10	9.33
	Dec.	1-10	78.6	79.53	555.00	552.50	-2.50	2.75	0.49	0.00	0.00	3.24	79.57	47.430	44.10	2.09	0.09	5.43
		11-20	79.53	79.10	552.50	533.00	-19.50	14.97	0.20	0.00	0.00	15.16	79.32	46.810	61.30	2.87	0.18	18.21
		21-30	79.1	78.05	533.00	522.00	-11.00	8.14	0.51	0.00	0.00	8.64	78.98	45.930	38.80	1.83	0.07	10.54
	Jan.	1-10	78.05	78.60	522.00	512.00	-10.00	6.34	0.49	0.00	0.00	6.83	78.73	45.310	40.30	1.83	0.07	8.73
		11-20	78.6	78.20	512.00	496.00	-16.00	16.15	0.49	0.00	0.00	16.54	78.40	44.500	45.90	2.04	0.09	19.78
		21-31	77.2	78.10	496.00	492.00	-4.00	1.14	0.70	0.00	0.00	1.84	78.15	43.870	52.00	2.28	0.12	4.24
	Feb.	1-10	77.1	77.65	492.00	472.50	-19.50	15.25	0.49	0.00	0.00	15.84	77.88	43.190	52.00	2.25	0.12	16.20
		11-20	77.65	77.20	472.50	455.00	-17.50	17.27	0.23	0.00	0.00	17.51	77.43	42.060	57.80	2.42	0.14	20.07
		21-30	77.2	77.10	455.00	451.00	-4.00	0.92	0.00	0.00	0.00	0.92	77.15	41.370	59.00	2.44	0.14	3.50
	March	1-10	77.1	76.85	451.00	440.00	-11.00	6.31	0.03	0.00	0.00	6.34	76.86	40.930	77.00	3.15	0.24	9.74
		11-20	76.85	75.25	440.00	418.00	-22.00	18.84	0.48	0.00	0.00	19.33	76.55	38.870	75.70	3.02	0.23	22.58
		21-30	75.25	75.95	418.00	405.50	-12.50	6.91	0.44	0.00	0.00	7.35	76.10	38.810	70.70	0.03	0.00	7.38
	April	1-10	75.95	75.60	405.50	394.00	-11.50	7.34	0.08	0.00	0.00	7.42	75.78	38.150	79.80	3.04	0.24	10.70
		11-20	75.6	74.85	394.00	389.00	-5.00	19.42	0.48	0.00	0.00	19.81	75.23	36.950	83.60	3.46	0.32	23.69
		21-31	74.85	74.40	389.00	356.00	-13.00	14.28	0.49	0.00	0.00	14.77	74.63	35.830	79.60	2.84	0.23	17.83
	May	1-10	74.4	74.00	356.00	342.00	-14.00	8.58	0.48	0.00	0.00	8.07	74.20	34.800	87.30	3.04	0.27	12.37
		11-20	74	70.76	342.00	248.00	-94.00	19.58	0.49	0.00	86.11	115.18	72.38	31.080	69.00	2.84	0.22	118.05
		21-30	70.76	65.70	248.00	136.00	-112.00	14.86	0.54	0.00	123.92	139.25	68.23	22.810	70.60	1.82	0.14	141.21
							262.99	10.43			248.64	292.41				3.64		2935.05



Year	Month	Period date	Reservoir level		Reservoir capacity		Reservoir capacity difference (Col. 7 - Col. 6)	Water Released through (M.Cum.)			Spillover Quantity through (M.Cum.)	Total releases (M.Cum.)	Average reservoir level during period (m) (Col. 4+5)	Average reservoir area corresponding to Ave. level	Evaporation depth in mm.	Evaporation losses Mm <sup>2</sup> Col. 15x16 1000	Other losses	Total Outflow	In flow		
			at beginning of period	at end of period	at mid	at mid		at mid	at mid	at mid											
1999	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	June	1-10	65.7	65.25	128.00	128.00	128.00	-8.00	5.55	0.29	0.00	0.00	5.84	65.48	17.470	78.63	1.37	0.11	7.32	-0.68	
		11-20	65.25	64.90	120.00	120.00	120.00	-8.00	11.74	0.39	0.00	0.00	12.14	65.08	16.770	30.80	0.52	0.02	12.67	4.67	
		21-30	64.9	68.10	144.00	144.00	144.00	24.00	0.21	0.00	0.00	0.00	145.96	65.50	17.500	29.70	0.52	0.02	146.50	170.50	
	July	1-10	66.1	66.50	144.00	144.00	144.00	8.00	7.71	0.22	0.00	0.00	21.76	66.30	18.920	43.70	0.63	0.04	30.55	36.55	
		11-20	66.5	67.65	152.00	177.00	177.00	25.00	2.89	0.17	0.00	0.00	698.00	67.08	20.380	8.90	0.18	0.00	801.24	926.24	
21-31		67.65	72.40	177.00	293.00	293.00	116.00	0.35	0.05	0.00	0.00	288.16	70.03	26.330	19.10	0.50	0.01	289.10	405.10		
Aug	1-10	72.4	74.10	283.00	345.00	345.00	52.00	1.32	0.26	0.00	0.00	236.12	73.25	32.900	12.90	0.42	0.01	237.13	288.13		
	11-20	74.1	72.90	345.00	307.00	307.00	-38.00		0.00	0.00	0.00	221.04	73.50	33.370	26.70	0.89	0.02	221.95	183.95		
	21-30	72.9	74.25	307.00	349.00	349.00	42.00	1.80	0.00	0.00	0.00	0.00	73.58	33.520	31.65	1.06	0.03	1.09	43.09		
Sept.	1-10	74.25	75.20	349.00	390.00	390.00	31.00	1.80	0.00	0.00	0.00	0.00	1.80	74.73	35.900	23.60	0.02	2.68	33.68		
	11-20	75.2	77.65	390.00	472.50	472.50	82.50		0.00	0.00	0.00	0.00	0.00	76.4	39.760	26.10	0.03	1.06	93.56		
	21-30	77.65	78.10	472.50	533.00	533.00	60.50		0.00	0.00	0.00	0.00	0.00	78.38	44.430	30.20	0.04	1.36	51.88		
Oct.	1-10	78.1	79.75	533.00	562.00	562.00	29.00		0.00	0.00	0.00	185.24	79.43	47.080	30.80	1.45	0.04	186.73	215.73		
	11-20	79.75	78.55	562.00	552.00	552.00	-10.00	3.43	0.00	0.00	0.00	122.13	79.65	47.680	36.90	1.76	0.06	123.95	113.35		
	21-31	78.55	79.80	552.00	568.00	568.00	16.00		0.00	0.00	0.00	10.30	79.73	47.930	52.30	2.51	0.13	16.37	32.37		
Nov.	1-10	79.8	79.60	568.00	555.00	555.00	-13.00	2.26	0.00	0.00	0.00	21.79	79.75	47.930	49.20	2.36	0.12	26.53	13.53		
	11-20	79.6	78.70	555.00	560.00	560.00	5.00	1.33	0.42	0.00	0.00	0.00	1.75	79.85	47.620	50.30	2.40	0.12	4.27	9.27	
	21-30	78.7	79.80	560.00	555.00	555.00	-5.00	7.33	0.26	0.00	0.00	0.00	7.61	78.65	47.620	49.40	2.35	0.12	13.08	5.08	
Dec.	1-10	78.6	79.15	555.00	535.00	535.00	-20.00	11.13	0.00	0.00	0.00	0.00	11.13	79.38	46.93	46.20	2.17	0.10	13.40	-6.60	
	11-20	79.15	78.90	535.00	524.00	524.00	-11.00	7.28	0.00	0.00	0.00	0.00	7.28	79.03	46.06	48.10	2.22	0.11	9.60	-1.40	
	21-30	78.9	78.75	524.00	518.00	518.00	-6.00	8.26	0.00	0.00	0.00	0.00	8.26	78.83	45.56	51.00	2.32	0.12	10.70	4.70	
2000	Jan.	1-10	78.75	78.50	518.00	508.00	508.00	-10.00	13.94	0.00	0.00	0.00	13.94	78.63	45.06	48.20	2.17	0.10	16.22	6.22	
		11-20	78.5	78.65	508.00	490.00	490.00	-18.00	14.09	0.00	0.00	0.00	0.00	14.09	78.28	44.18	46.40	2.05	0.10	16.24	-1.76
		21-31	78.05	77.70	490.00	475.00	475.00	-15.00	13.68	0.01	0.00	0.00	0.00	13.68	77.88	43.18	55.30	2.43	0.14	16.25	1.25
Feb.	1-10	77.7	78.25	475.00	457.00	457.00	-18.00	16.66	0.17	0.00	0.00	0.00	16.62	77.98	42.18	48.80	2.06	0.10	18.69	0.99	
	11-20	78.25	77.20	457.00	455.00	455.00	-2.00	3.06	0.24	0.00	0.00	0.00	3.30	77.73	41.58	54.40	2.26	0.12	5.68	3.68	
	21-30	77.2	76.80	455.00	438.00	438.00	-17.00	13.49	0.22	0.00	0.00	0.00	13.71	77.00	41.06	58.00	2.38	0.14	18.73	-0.77	
March	1-10	76.4	76.25	438.00	418.00	418.00	-20.00	18.55	0.27	0.00	0.00	0.00	19.22	76.63	39.87	75.20	3.00	0.23	22.44	2.44	
	11-20	76.25	75.90	418.00	404.00	404.00	-14.00	8.95	0.26	0.00	0.00	0.00	9.23	76.08	38.78	71.20	2.76	0.20	12.19	-1.81	
	21-30	75.9	75.55	404.00	382.50	382.50	-21.50	7.75	0.23	0.00	0.00	0.00	8.02	75.73	38.03	197.20	7.50	1.48	17.90	5.90	
April	1-10	75.95	76.00	382.50	374.00	374.00	-8.50	18.11	0.37	0.00	0.00	0.00	18.46	76.28	37.03	81.60	3.03	0.25	21.76	3.26	
	11-20	77	74.25	374.00	349.00	349.00	-25.00	20.80	0.02	0.00	0.00	0.00	20.82	74.63	35.66	84.60	3.02	0.26	24.10	-0.90	
	21-31	74.25	73.90	349.00	327.00	327.00	-22.00	18.91	0.08	0.00	0.00	0.00	18.93	73.93	34.25	73.70	2.70	0.21	21.90	-0.10	
May	1-10	73.8	73.25	327.00	317.00	317.00	-10.00	10.68	0.49	0.00	0.00	0.00	11.08	73.43	33.250	86.60	2.68	0.26	14.21	4.21	
	11-20	73.25	73.00	317.00	310.00	310.00	-7.00	6.66	0.48	0.00	0.00	0.00	7.75	73.13	32.650	72.80	2.98	0.17	10.90	3.90	
	21-30	73	72.55	310.00	297.00	297.00	-13.00	16.90	0.08	0.00	0.00	0.00	16.98	72.78	31.950	70.80	2.26	0.16	19.35	6.35	
								0.00	5.07	0.00	0.00	2149.31	2430.12				5.15	2435.27	2435.27		



000140

Year	Month	Period date	Reservoir level		Reservoir capacity		Reservoir capacity difference Col. 7 - Col. 6	Water Released through (ft. cum)			Spillway Quantity through (ft. cum)	Total releases (ft. cum)	Average reservoir level during period (ft) (Col. 4-5)	Average reservoir area corresponding to Ave. level (sq. ft.)	Evaporation depth in mm.	Evaporation losses (mm) Col. 15x16 /1000	Other losses	Total Outflow	In flow
			at beginning of period	at end of period	at beginning	at end		RBHR	LBHR	BFO									
2000	1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	June	1-10	72.55	72.45	297.00	294.50	-2.50	9.23	0.00	0.00	0.00	9.23	72.50	31.40	54.10	1.70	0.09	11.02	8.52
		11-20	72.45	72.00	294.50	280.00	-14.50	5.83	0.03	0.00	0.00	19.27	72.25	30.80	51.60	1.59	0.08	20.94	5.44
		21-30	72	66.00	280.00	142.00	-138.00	16.42	0.48	0.00	0.00	172.61	69.00	24.35	51.50	1.25	0.06	190.22	52.22
	July	1-10	66	67.40	142.00	172.00	30.00	2.21	0.31	0.00	0.00	146.43	66.70	19.65	10.80	0.21	0.00	146.65	176.55
		11-20	67.4	66.85	172.00	158.50	-13.50	0.00	0.00	0.00	0.00	143.91	67.13	20.40	12.90	0.26	0.00	735.98	722.48
		21-31	66.85	68.70	158.50	200.00	41.50	0.97	0.37	0.00	0.00	61.38	67.68	21.68	57.70	1.25	0.07	52.69	104.19
	Aug	1-10	68.7	70.40	200.00	238.00	38.00	12.96	0.46	0.00	0.00	13.42	69.55	25.17	31.10	0.78	0.02	14.23	52.23
		11-20	70.4	72.70	238.00	301.00	63.00	2.17	0.00	0.00	0.00	2.17	71.55	32.32	28.65	0.93	0.03	3.12	66.12
		21-30	72.7	75.80	301.00	400.00	99.00	1.63	0.00	0.00	0.00	272.12	74.25	37.97	18.00	0.71	0.01	274.48	373.48
	Sept.	1-10	75.8	75.90	400.00	404.00	4.00	1.48	0.00	0.00	0.00	155.16	75.85	38.30	41.20	1.58	0.07	156.80	180.80
		11-20	75.9	76.50	404.00	428.00	24.00	6.92	0.18	0.00	0.00	7.10	76.20	36.07	47.90	2.10	0.09	9.06	33.06
		21-30	76.5	76.85	428.00	440.50	12.50	18.31	0.49	0.00	0.00	18.80	76.68	40.48	51.90	2.10	0.11	21.01	33.51
	Oct.	1-10	76.85	77.00	440.50	447.00	6.50	13.81	0.19	0.00	0.00	0.00	76.93	40.81	48.80	1.98	0.10	16.38	22.88
		11-20	77	77.15	447.00	453.00	6.00	14.48	0.02	0.00	0.00	14.50	77.08	41.18	43.80	1.80	0.08	16.38	22.38
		21-31	77.15	77.15	453.00	453.00	0.00	1.14	0.00	0.00	0.00	1.14	77.15	41.37	54.80	2.68	0.17	4.00	4.00
	Nov.	1-10	77.15	78.90	453.00	453.00	0.00	12.75	0.00	0.00	0.00	12.75	77.03	41.09	57.80	2.37	0.14	15.25	15.25
		11-20	78.9	76.80	443.00	428.00	-15.00	14.68	0.03	0.00	0.00	14.71	76.70	40.25	50.90	2.05	0.10	16.86	1.86
		21-30	76.5	76.10	428.00	412.00	-16.00	15.00	0.49	0.00	0.00	15.49	76.30	39.27	51.80	2.03	0.11	17.63	1.63
	Dec.	1-10	76.1	75.60	412.00	400.00	-12.00	11.86	0.49	0.00	0.00	12.35	75.95	38.50	51.40	1.98	0.10	14.43	-357.57
2001		11-20	75.8	75.40	400.00	387.00	-13.00	14.37	0.32	0.00	0.00	14.69	75.90	37.75	41.10	1.55	0.06	16.30	3.30
		21-30	75.4	74.85	387.00	389.00	-18.00	18.71	0.54	0.00	0.00	19.25	75.13	36.70	41.40	1.52	0.06	20.83	2.83
	Jan.	1-10	74.85	74.40	389.00	358.00	-31.00	19.58	0.26	0.00	0.00	19.84	74.53	35.65	39.40	1.40	0.06	21.30	8.30
		11-20	74.4	74.20	358.00	348.00	-10.00	16.15	0.48	0.00	0.00	16.34	74.30	35.00	44.50	1.56	0.07	20.86	12.86
		21-31	74.2	73.95	348.00	338.00	-10.00	15.58	0.39	0.00	0.00	15.97	74.03	34.45	59.40	2.05	0.12	18.14	6.14
	Feb.	1-10	73.95	73.20	338.00	316.00	-22.00	19.58	0.26	0.00	0.00	19.84	73.53	33.45	53.40	1.79	0.10	21.72	1.72
		11-20	73.2	72.80	316.00	298.00	-18.00	18.85	0.46	0.00	0.00	19.34	72.90	32.20	62.60	2.02	0.13	21.48	3.48
		21-30	72.8	72.75	298.00	285.50	-12.50	15.58	0.36	0.00	0.00	15.97	72.68	31.10	45.00	1.40	0.06	17.44	4.94
	March	1-10	72.75	71.55	285.50	268.50	-17.00	17.82	0.33	0.00	0.00	18.14	71.85	30.05	60.60	1.82	0.11	20.07	3.07
		11-20	71.55	71.20	268.50	258.00	-10.50	8.51	0.03	0.00	0.00	8.54	71.38	29.15	69.20	2.02	0.14	10.70	0.70
		21-30	71.2	70.30	258.00	236.00	-22.00	23.06	0.31	0.00	0.00	23.37	70.75	27.75	65.10	2.36	0.20	25.94	3.94
	April	1-10	70.3	69.55	236.00	218.00	-18.00	18.56	0.36	0.00	0.00	18.94	69.94	26.85	53.20	2.15	0.18	22.27	4.27
		11-20	69.55	68.60	218.00	202.00	-16.00	16.20	0.48	0.00	0.00	16.36	69.18	24.30	66.30	2.10	0.18	21.66	5.66
		21-31	68.6	67.85	202.00	181.00	-21.00	20.71	0.26	0.00	0.00	20.98	68.33	22.68	68.10	2.00	0.18	23.15	2.15
	May	1-10	67.85	67.08	181.00	163.50	-17.50	19.70	0.00	0.00	0.00	19.70	67.45	21.82	51.40	1.92	0.18	21.80	4.30
		11-20	67.08	65.80	163.50	140.00	-23.50	20.47	0.31	0.00	0.00	20.78	66.46	19.23	67.40	1.88	0.15	22.61	-0.89
		21-30	65.8	65.30	140.00	129.00	-11.00	9.53	0.00	0.00	0.00	10.07	65.60	17.70	87.40	1.72	0.17	11.96	0.96
							330	467.50	9.09	0.00	1643.16	2021.78				0.00	3.58	2025.38	2025.28





Year	Month	Period date	Reservoir level		Reservoir capacity		Reservoir capacity Difference Col. 7 - Col. 6	Water Released through (M.Cum.)			Spillover Quantity through (M.Cum.)	Total referrals (M.Cum.)	Average reservoir level (ft.) (Col. 4+5)	Average reservoir area corresponding to Avg. level (Sq. ft.)	Evaporation depth in mm.	Evaporation losses Mm <sup>3</sup> Col. 15+16 /1000	Other losses	Total Outflow	In flow
			at beginning of period	at end of period	at beginning	at end		RRR	LHR	DR									
2001	June	1-3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		1-10	65.3	64.80	126.00	118.00	-11.00	16.57	0.49	0.00	0.00	17.06	65.05	16.77	71.70	1.20	0.09	18.35	7.35
		11-20	64.8	66.35	118.00	149.00	31.00	0.81	0.13	0.00	0.00	213.27	65.58	17.66	13.50	0.24	0.00	214.44	245.44
	July	21-30	66.35	66.25	149.00	146.50	-2.50	4.07	0.00	0.00	76.37	80.44	66.30	18.95	43.50	0.82	0.04	81.30	78.80
		1-10	66.25	67.35	146.50	149.00	2.50	3.99	0.41	0.00	303.81	308.32	66.80	19.00	9.60	0.19	0.00	308.51	311.01
		11-20	67.35	67.00	149.00	162.00	13.00	0.65	0.06	0.00	308.03	308.11	67.18	20.46	14.20	0.29	0.00	308.40	321.40
	Aug	21-31	67	72.90	162.00	307.00	145.00	0.65	0.03	0.00	101.42	102.10	69.55	25.87	19.70	0.51	0.01	102.62	247.62
		1-10	72.9	73.85	307.00	340.00	33.00	1.26	0.28	0.00	167.29	168.85	73.43	33.25	11.30	0.38	0.00	169.23	202.23
		11-20	73.85	73.45	340.00	324.50	-15.50	0.31	0.00	0.00	481.00	481.56	73.70	33.80	8.10	0.31	0.00	481.87	466.37
2002	Sept.	21-30	73.45	75.80	324.50	384.00	69.50	3.17	0.00	0.00	-25.00	16.40	74.53	35.39	35.90	1.27	0.05	17.72	87.22
		1-10	75.6	75.55	384.00	430.00	36.00	6.89	0.00	0.00	13.23	0.00	75.58	38.75	30.80	1.19	0.04	1.23	37.23
		11-20	75.55	77.80	430.00	470.00	40.00	10.21	0.23	0.00	0.00	9.12	76.58	41.19	35.70	1.47	0.05	10.64	50.64
	Oct.	21-31	77.6	78.45	470.00	506.00	36.00	10.21	0.49	0.00	0.00	10.70	78.03	43.55	40.90	1.78	0.07	12.55	48.55
		1-10	78.45	79.40	506.00	545.00	39.00	1.45	0.42	0.00	0.00	1.87	78.93	45.80	28.50	1.31	0.04	3.21	42.21
		11-20	79.4	79.00	545.00	568.00	23.00	3.78	0.00	0.00	0.00	20.46	79.20	47.62	40.90	1.86	0.08	22.48	45.48
	Nov.	21-30	79	79.55	568.00	557.00	-11.00	5.98	0.07	0.00	16.68	28.86	79.33	47.94	46.40	2.22	0.10	26.18	18.18
		1-10	79.55	79.38	557.00	543.00	-14.00	17.39	0.49	0.00	20.91	17.83	79.50	47.25	44.50	2.10	0.09	20.03	6.03
		11-20	79.38	79.35	543.00	543.00	0.00	5.64	0.16	0.00	0.00	5.80	79.35	46.87	41.80	1.96	0.08	7.84	7.84
2003	Dec.	21-31	79.35	79.00	543.00	528.00	-15.00	18.97	0.49	0.00	0.00	17.46	79.18	46.44	44.80	2.08	0.09	19.64	4.64
		1-10	79	78.60	528.00	512.00	-16.00	18.80	0.49	0.00	0.00	19.23	78.90	45.50	45.60	2.07	0.09	21.46	5.46
		11-20	78.6	78.30	512.00	500.00	-12.00	18.06	0.40	0.00	0.00	16.51	78.45	44.62	45.00	2.01	0.09	18.60	6.60
	Jan.	21-30	78.3	77.85	500.00	482.00	-18.00	15.73	0.58	0.00	0.00	16.31	78.08	43.69	44.50	1.94	0.09	18.34	0.34
		1-10	77.85	77.50	482.00	466.00	-16.00	13.01	0.61	0.00	0.00	13.62	77.88	42.89	40.90	1.75	0.07	15.44	-0.56
		11-20	77.5	77.40	466.00	463.00	-3.00	2.84	0.61	0.00	0.00	3.55	77.45	42.12	45.70	1.92	0.09	5.56	2.56
	Feb.	21-31	77.4	78.85	463.00	440.50	-22.50	20.19	0.67	0.00	0.00	20.86	78.63	41.30	49.50	2.04	0.10	23.00	0.50
		1-10	78.85	76.25	440.50	418.00	-22.50	18.35	0.03	0.00	0.00	18.38	78.05	39.67	46.80	1.87	0.09	20.33	-2.17
		11-20	76.25	75.75	418.00	398.50	-19.50	18.38	0.58	0.00	0.00	16.96	76.00	38.90	49.90	1.93	0.10	16.98	-0.52
2004	March	21-30	75.75	75.35	398.50	385.50	-13.00	14.23	0.48	0.00	0.00	14.72	75.55	37.67	42.60	1.60	0.07	16.38	3.38
		1-10	75.35	74.85	385.50	369.00	-16.50	16.89	0.06	0.00	0.00	19.97	75.10	36.65	61.90	2.27	0.14	22.38	5.88
		11-20	74.85	74.65	369.00	351.00	-18.00	17.59	0.58	0.00	0.00	18.17	74.55	35.46	80.20	2.13	0.13	20.44	2.44
	April	21-31	74.3	73.00	351.00	334.00	-17.00	16.55	0.33	0.00	0.00	18.88	74.05	-34.50	77.70	2.68	0.21	19.77	2.77
		1-10	73.8	73.45	334.00	324.50	-9.50	6.52	0.47	0.00	0.00	8.99	73.63	33.85	67.80	2.28	0.15	11.42	1.92
		11-20	73.45	72.80	324.50	304.00	-20.50	21.53	0.40	0.00	0.00	22.24	73.13	33.65	80.60	2.71	0.22	25.17	4.67
	May	21-30	72.8	72.10	304.00	284.00	-20.00	18.28	0.18	0.00	0.00	21.71	72.45	31.30	89.00	3.10	0.31	26.12	5.12
		1-10	72.1	71.40	284.00	263.00	-21.00	19.28	0.18	0.00	0.00	18.47	71.75	29.82	84.00	2.80	0.26	21.53	0.53
		11-20	71.4	70.85	263.00	245.50	-17.50	19.93	0.49	0.00	0.00	20.42	71.03	26.46	97.80	2.79	0.27	23.48	5.98
21-31			70.85	69.90	245.50	226.00	-19.50	21.47	0.12	0.00	0.00	21.51	70.28	26.65	94.20	2.51	0.24	24.25	4.75
			1677.01										2119.22						



Year	Month	Period date	Reservoir level		Reservoir capacity		Water Released through			Spillover quantity through (M Cum.)	Total releases (H.Cum)	Average reservoir level during period (m) (Col. 445)	Average reservoir area corresponding to Ave. level	Evaporation depth in mm.	Evaporation losses mm/1000 Col. 15x18	Other losses	Total Outflow	In flow
			at beginning of period	at end of period	at beginning	at end	RRR	LBRR	BPO									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2002	June	1-10	69.9	69.25	228.00	211.50	18.04	0.27	0.00	0.00	18.31	69.58	25.05	82.80	2.32	0.22	20.85	6.35
		11-20	68.25	68.80	211.50	197.00	15.94	0.49	0.00	0.00	16.43	68.93	23.85	50.60	1.21	0.06	17.69	3.19
		21-30	68.6	69.06	197.00	207.00	0.34	0.02	0.00	602.09	602.48	68.83	23.65	7.90	0.19	0.00	602.86	612.96
	July	1-10	69.066	66.20	207.00	146.00	0.63	0.00	0.00	218.68	220.31	67.63	21.44	39.20	0.84	0.03	221.19	150.19
		11-20	68.2	66.70	146.00	156.00	4.08	0.46	0.00	90.73	95.88	66.45	19.25	29.30	0.56	0.02	98.46	106.46
		21-31	65.7	73.95	156.00	340.00	6.92	0.54	0.00	0.00	7.46	70.33	26.75	30.20	0.81	0.02	8.29	132.29
	Aug	1-10	73.95	76.05	340.00	408.50	10.20	0.30	0.00	263.58	296.25	75.00	35.40	14.50	0.53	0.01	284.79	364.29
		11-20	76.05	75.10	408.50	377.00	0.00	0.00	0.00	388.29	388.29	75.58	37.74	18.70	0.71	0.01	389.01	356.51
		21-30	75.1	76.80	377.00	438.00	4.18	0.00	0.00	238.87	243.15	75.95	38.50	26.40	1.02	0.03	244.20	305.20
	Sept.	1-10	76.8	76.80	438.00	438.00	1.58	0.00	0.00	0.00	4.98	77.30	41.75	23.30	0.94	0.02	301.60	301.60
		11-20	76.8	77.80	438.00	480.00	4.88	0.10	0.00	0.00	4.98	77.30	41.75	26.60	1.53	0.06	8.95	48.55
		21-31	77.8	78.05	480.00	490.00	9.82	0.49	0.00	0.00	10.33	77.93	43.31	10.20	0.44	0.00	10.78	20.78
	Oct.	1-10	78.05	78.10	490.00	492.00	2.00	0.49	0.00	0.00	19.69	78.08	43.69	61.80	2.69	0.17	13.75	15.75
		11-20	78.1	77.80	492.00	480.00	17.81	0.49	0.00	0.00	18.40	77.95	48.55	68.90	3.34	0.23	21.97	9.97
		21-30	77.8	77.45	480.00	484.50	19.16	0.38	0.00	0.00	19.54	77.63	52.56	63.10	3.32	0.21	22.07	7.57
	Nov.	1-10	77.45	77.05	484.50	449.00	14.40	0.00	0.00	0.00	14.40	77.25	41.52	50.20	2.09	0.10	16.59	1.09
		11-20	77.05	76.75	449.00	436.50	14.81	0.00	0.00	0.00	14.81	76.90	40.75	46.30	1.89	0.08	16.76	4.26
		21-31	76.75	76.80	436.50	432.00	3.18	0.00	0.00	0.00	3.18	76.68	40.19	55.20	2.22	0.12	5.52	1.02
	Dec.	1-10	76.8	76.80	432.00	420.00	11.77	0.08	0.00	0.00	11.64	76.70	39.62	56.40	2.31	0.14	14.29	2.29
		11-20	76.6	75.75	420.00	398.50	17.10	0.49	0.00	0.00	17.32	76.28	38.65	57.20	2.21	0.13	16.86	-1.64
		21-30	75.75	75.20	398.50	380.00	16.41	0.54	0.00	0.00	18.95	75.48	37.51	60.50	1.74	0.08	18.77	0.27
	Jan.	1-10	75.2	74.85	380.00	368.00	11.32	0.49	0.00	0.00	11.81	75.03	36.46	43.40	1.55	0.07	13.42	2.42
		11-20	74.85	74.70	368.00	364.00	2.72	0.12	0.00	0.00	2.85	74.78	35.84	46.20	1.66	0.08	4.59	-0.41
		21-31	74.7	74.15	364.00	346.50	18.32	0.00	0.00	0.00	18.32	74.43	35.24	56.50	1.99	0.11	20.42	2.82
	Feb.	1-10	74.15	73.65	346.50	326.00	15.57	0.28	0.00	0.00	15.85	73.90	34.20	51.60	1.71	0.09	17.69	0.19
		11-20	73.65	73.15	326.00	314.50	17.17	0.61	0.00	0.00	17.78	73.40	33.20	51.00	1.94	0.08	19.56	5.06
		21-30	73.15	72.65	314.50	299.50	13.31	0.49	0.00	0.00	13.80	72.90	32.15	53.20	1.71	0.09	15.60	0.60
	March	1-10	72.65	72.05	299.50	287.00	16.44	0.41	0.00	0.00	16.65	72.35	31.07	76.80	2.39	0.16	19.42	1.92
		11-20	72.05	71.45	287.00	265.00	18.44	0.45	0.00	0.00	14.08	71.75	29.82	77.50	2.16	0.18	16.38	-0.62
		21-31	71.45	70.80	265.00	249.00	18.17	0.67	0.00	0.00	19.14	71.13	28.65	81.60	2.02	0.24	22.01	6.01
	April	1-10	70.80	70.05	249.00	228.50	19.56	0.61	0.00	0.00	20.19	70.43	28.86	86.00	2.84	0.23	22.06	3.56
		11-20	70.05	69.35	228.50	214.00	17.92	0.51	0.00	0.00	18.43	69.70	25.30	93.20	2.36	0.22	21.03	5.51
		21-30	69.35	68.60	214.00	197.00	16.07	0.06	0.00	0.00	18.14	68.98	23.85	84.60	2.03	0.17	18.34	1.34
	May	1-10	68.6	67.65	197.00	177.00	21.13	0.49	0.00	0.00	21.62	68.13	22.51	84.80	1.89	0.16	23.66	3.66
		11-20	67.65	66.80	177.00	160.00	15.21	0.18	0.00	0.00	15.36	67.28	20.85	84.40	1.95	0.18	17.52	0.52
		21-30	66.80	66.00	160.00	129.00	16.66	0.08	0.00	0.00	16.78	66.46	19.25	86.40	1.81	0.19	18.86	-12.14
							435.28	16.64		2122.49	2568.99					4.80	2636.19	2539.19



# **DAMAN GANGA (MADHUBAN) RESERVOIR PROJECT**

## **ANNEXURE - C**

**STATEMENT SHOWING THE LIVE STORAGE CAPACITY IN MM<sup>3</sup>  
AT DIFFERENT ELEVATION**

**CAPAICTY AT 61.60 m = 65.00 Mm<sup>3</sup> DEAD STORAGE**

Elevation	LIVE STORAGE IN Mm <sup>3</sup>									
in Mts.	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90
61.00	0.00	0.00	0.00	0.00	0.00	0.00	65	67	69	71
62.00	72	73	75	77	78	80	81	83	84	86
63.00	88	90	91	93	95	96	98	100	102	104
64.00	105	107	108	110	112	114	115	117	118	120
65.00	122	125	127	129	130	132	134	136	138	140
66.00	142	144	145	148	150	152	154	156	157	160
67.00	162	165	167	170	172	174	176	178	180	182
68.00	184	187	189	191	193	195	197	200	202	204
69.00	206	208	210	213	215	217	219	221	223	226
70.00	228	231	234	236	238	241	244	247	249	252
71.00	254	256	258	261	263	267	270	273	275	278
72.00	280	284	287	290	293	296	298	301	304	307
73.00	310	313	316	319	322	325	327	331	334	338
74.00	342	345	348	351	356	358	361	364	367	371
75.00	374	377	380	384	387	391	394	397	400	404
76.00	407	412	416	420	424	428	432	435	438	443
77.00	447	451	455	459	463	466	470	475	480	484
78.00	488	492	495	500	504	508	512	516	520	524
79.00	528	533	537	541	545	550	555	560	567	568
80.00	572	577	583	588	594	598	603	607	612	617
81.00	622	628	633	639	645	649	654	659	665	671
82.00	677	683	688	694	700	-	-	-	-	-



## Date/Discharge in currences

Year	Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	*24	*25	26	27	28	29	30	31	
1994	June																	824 67	744 38	29 4	173 54	116 67	81 25	190 94	888 61	887 46	874 42	886 25					
1994	July	1056 63	692	412	310	265	20	283	341	311	342	608	2408	3372	3124	2258	941	523	397	460	567	1403	1907	739	563	565	578	579	340	156	269	6	
1994	August	317	327	327	325	228	67						2160	617	673	638	261	206	373	686	148			2600	559	478	637	2468	1122	929	941	1943	
1994	September	703	493	520	482	531	752	874	1136	905	467	365	165				257	288	216	217	216	99											
1994	October																																
1994	November																																
1994	December																																
1995	June																																
1995	July																																
1995	August	369	266	341	381	450	440	428	172										298	371	478	906	990	446	477	591	582	581	253	131	142	151	
1995	September		595	3611	928	462	295	197	811								143	147	107	107	108	71											
1995	October																																
1995	November																																
1995	December																																
1996	June																107	180	174	352	435	392	338	278	266	100	50	35	80	13	42		
1996	July																																
1996	August	443	446	446	444	419	286	283	723	838	478	463	346	255	256	259	269	261	261	263	266	268	269	265	156	90	1356	614	56	285	889	742	
1996	September	623	294	295	296	296	294	122					95	326	326	327	325	325	325	323	323												
1996	October				262	112	112	311	111	111	55													23	112	114	111	60					
1996	November																																
1997	June																									4	31	49	56	73	83		
1997	July	68	52	50	46	46	67	140	153	162	166	129	90	75	67	59	47	42	34	28	38	9				345	943	1146	710	2786			
1997	August	2669	962	711	542	276	292	303	312	313	543											175	194	1592	3209	1840	2314	421		126			
1997	September	541	639	236																													
1997	October																																
1997	November																																

Year	Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1998	June	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	July	27	50	74	91	140	227	282	779	767	388	263	166	122	130	158	270	253	331	448	434	283	131	54	43	-	47	41	29	20	16	-
1998	August	-	-	-	-	-	-	-	-	75	576	368	576	493	223	-	-	-	-	197	46	-	-	-	-	-	-	-	-	-	-	-
1998	September	421	423	422	422	306	309	209	78	-	1042	950	419	418	410	622	2284	4561	544	75	-	-	-	-	-	26	186	382	370	202	156	-
1998	October	110	151	504	192	-	-	-	-	56	90	89	89	176	176	224	254	166	97	18	-	-	-	-	-	-	-	-	-	-	-	-
1998	November	-	8	22	32	43	45	45	37	45	45	45	45	45	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1999	June	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1999	July	54	46	45	42	40	25	-	-	-	-	-	-	-	410	1410	2641	2419	1312	1331	965	671	528	566	848	538	182	-	-	-	-	-
1999	August	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1999	September	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1999	October	-	97	195	194	143	92	105	308	617	388	552	327	183	95	96	96	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1999	November	75	75	75	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2000	June	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2000	July	49	34	52	173	148	140	135	200	261	483	555	558	1410	2100	1467	843	464	352	260	307	256	232	115	-	314	903	451	355	370	376	378
2000	August	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2000	September	379	267	375	271	185	116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2000	October	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2000	November	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2001	June	-	-	-	-	-	-	-	-	-	-	-	-	-	6	234	597	920	564	333	153	611	86	75	-	59	50	55	125	167	102	-
2001	July	86	75	196	14	671	454	353	287	349	530	564	605	404	327	200	287	244	240	263	340	331	-	-	-	-	-	-	-	-	-	-
2001	August	192	193	192	193	194	192	191	191	195	202	207	209	204	296	734	1244	1318	840	309	110	111	42	-	-	-	-	-	-	-	-	-
2001	September	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2001	October	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2001	November	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Year	Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2002	June																															
2002	July	1099	165	221	174	181	137	111	98	81	75	71	62	62	62	62	71	95	134	188	239	96										
2002	August																															
2002	September																															
2002	October																															
2002	November																															
2003	June																															
2003	July	274	181	170	125	105	89	82	90	132	114	147	141	116	58																	
2003	August																															
2003	September																															
2003	October	474	314	313	266	116	128	102																								
2003	November	221																														
2004	June																															
2004	July	457	393	240	150	140	120	140	120	100	87.5	120	120	120	120	120	100	87	87	75	75	62	75	100	100	87	120	140	160	250	235	913
2004	August	626	740	4930	1431	3120	1918	723	666	643	577	638	1950	1075																		
2004	September																															
2004	October																															
2004	November																															
2005	June	1640	3499	2350	1670	850	500	310	230	215	180	150	140	140	140	120	100	87	87	75	75	120	180	180	150	150	230	250	1170	1010	825	670
2005	July																															
2005	August	590	1400	2650	1650	1640	920	620	400	234																						
2005	September																															
2005	October																															
2005	November																															





		2001-2002												2002-2003												2003-2004												2004-2005												2005-2006												2006-2007												2007-2008												2008-2009												2009-2010												2010-2011												2011-2012												2012-2013												2013-2014												2014-2015												2015-2016												2016-2017												2017-2018												2018-2019												2019-2020												2020-2021												2021-2022												2022-2023												2023-2024												2024-2025												2025-2026												2026-2027												2027-2028												2028-2029												2029-2030												2030-2031												2031-2032												2032-2033												2033-2034												2034-2035												2035-2036												2036-2037												2037-2038												2038-2039												2039-2040												2040-2041												2041-2042												2042-2043												2043-2044												2044-2045												2045-2046												2046-2047												2047-2048												2048-2049												2049-2050												2050-2051												2051-2052												2052-2053												2053-2054												2054-2055												2055-2056												2056-2057												2057-2058												2058-2059												2059-2060												2060-2061												2061-2062												2062-2063												2063-2064												2064-2065												2065-2066												2066-2067												2067-2068												2068-2069												2069-2070												2070-2071												2071-2072												2072-2073												2073-2074												2074-2075												2075-2076												2076-2077												2077-2078												2078-2079												2079-2080												2080-2081												2081-2082												2082-2083												2083-2084												2084-2085												2085-2086												2086-2087												2087-2088												2088-2089												2089-2090												2090-2091												2091-2092												2092-2093												2093-2094												2094-2095												2095-2096												2096-2097												2097-2098												2098-2099												2099-2100												2100-2101												2101-2102												2102-2103												2103-2104												2104-2105												2105-2106												2106-2107												2107-2108												2108-2109												2109-2110												2110-2111												2111-2112												2112-2113												2113-2114												2114-2115												2115-2116												2116-2117												2117-2118												2118-2119												2119-2120												2120-2121												2121-2122												2122-2123												2123-2124												2124-2125												2125-2126												2126-2127												2127-2128												2128-2129												2129-2130												2130-2131												2131-2132												2132-2133												2133-2134												2134-2135												2135-2136												2136-2137												2137-2138												2138-2139												2139-2140												2140-2141												2141-2142												2142-2143												2143-2144												2144-2145												2145-2146												2146-2147												2147-2148												2148-2149												2149-2150												2150-2151												2151-2152												2152-2153												2153-2154												2154-2155												2155-2156												2156-2157												2157-2158												2158-2159												2159-2160												2160-2161												2161-2162												2162-2163												2163-2164												2164-2165												2165-2166												2166-2167												2167-2168												2168-2169												2169-2170												2170-2171												2171-2172												2172-2173												2173-2174												2174-2175												2175-2176												2176-2177												2177-2178												2178-2179												2179-2180												2180-2181												2181-2182												2182-2183												2183-2184												2184-2185												2185-2186												2186-2187												2187-2188												2188-2189												2189-2190												2190-2191												2191-2192												2192-2193												2193-2194												2194-2195												2195-2196												2196-2197												2197-2198												2198-2199												2199-2200												2200-2201												2201-2202												2202-2203												2203-2204												2204-2205												2205-2206												2206-2207												2207-2208												2208-2209												2209-2210												2210-2211												2211-2212												2212-2213												2213-2214												2214-2215												2215-2216												2216-2217												2217-2218												2218-2219												2219-2220												2220-2221												2221-2222												2222-2223												2223-2224												2224-2225												2225-2226												2226-2227												2227-2228												2228-2229												2229-2230												2230-2231												2231-2232												2232-2233												2233-2234												2234-2235												2235-2236												2236-2237												2237-2238												2238-2239												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Year	Month	2005-2006												21	22	23	24	25	26	27	28	29	30	31	Runing	Average									
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2005	June	500	500	500	625	700	700	700	700	700	700	700	700	567	500	500	500	500	500	500	500	500	333	83	-	-	-	-	-	-	-	-	24		
2005	July	-	-	-	-	-	-	-	-	-	-	-	-	-	156	250	250	250	146	-	-	-	-	-	-	-	-	-	-	-	-	-	5		
2005	August	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2005	September	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2005	October	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5		
2005	November	200	200	200	200	200	192	450	650	650	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	677	650	596	550	160	-	30		
2005	December	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	146	250	344	400	400	400	400	400	400	525	600	631	650	650	13	
2006	January	650	650	519	490	650	650	650	650	683	700	700	700	700	700	512	400	400	400	400	450	400	400	167	-	-	-	-	-	-	-	-	-	23	
2006	February	-	175	425	531	550	550	581	620	577	400	546	650	712	750	750	750	750	750	750	750	692	562	500	300	300	300	300	750	750	750	750	750	27	
2006	March	300	300	300	300	300	604	750	750	750	750	750	750	750	750	750	750	750	750	750	667	750	750	750	750	750	750	750	750	750	750	750	750	29	
2006	April	750	750	750	733	650	650	650	650	650	650	650	650	650	650	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	30	
2006	May	600	329	300	300	300	300	300	300	300	600	600	600	600	600	700	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	31	



ANNEXURE - P-4

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Government of Gujarat

## **CONCESSION AGREEMENT**

For

Setting up Small Hydro Power Station  
on Damanganga ( Madhuban ) Dam, Gujarat

Grantor :

Narmada, Water Resources,  
Water Supply and Kalpsar Department.  
Government of Gujarat.  
GANDHINAGAR

Concessionaire :

M/s TARINI Infrastructure Ltd.  
D-2, 1<sup>st</sup> Floor, Amar Colony  
Lajpat Nagar,  
NEW DELHI 110 024

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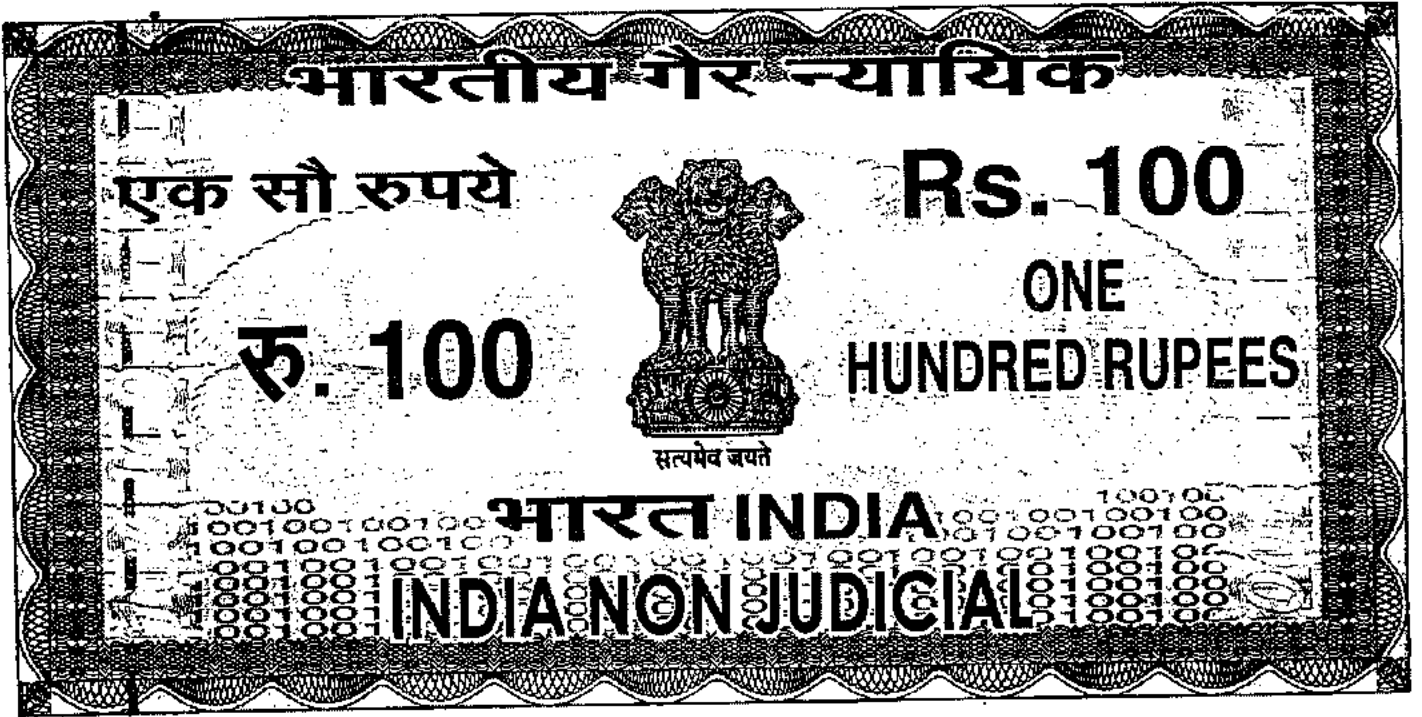
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गुजरात गुजरात GUJARAT

अनु. नं. 12/148 तारीख 24/08/07 श. 100 D 465299  
 नाम Tarini Infrastructure Ltd.  
 ठेकाधु 2, 1st Floor, Amar Colony, Lajpat Nagar IV -  
 हस्ते Tarini Infrastructure Ltd. New Delhi.  
 ला. नं. 5/2002 प्रहरी  
 प्रतीभादेन अ.न. लक्ष्मी वेन्सनी लक्ष्मी  
 रहे. : बी/६३, भावस्मृति सोसायटी, ६६६ विद्यालय पाठन,  
 दिवाणीपुरा, बडोदरा. डोन : ५५३३७२०

THIS AGREEMENT is made at Madhuban Colony the August 27 th, 2007

## BETWEEN

- (1) Narmada Water Resources, Water Supply & Kalpsar Department Gandhinagar, Statutory body of the Government of Gujarat, its office situated, under the name of the office of the Executive Engineer, Damanganga Project Division No. 1, Madhuban Colony, P.O. KARAD D.P. Pin. 396 240, Via: Silvassa, U.T. of Dadra and Nagar Haveli, ( here in after referred to as the "GRANTOR" which expression shall include its successor and permitted assigns ), of the ONE PART,

AND

FOR TARIKI INFRASTRUCTURE LTD.

*[Signature]*  
 D. RECTOR

*[Signature]*

- (2) M/s TARINI INFRASTRUCTURE Ltd, a company incorporated under the laws of India whose registered office is located at D-2, 1<sup>st</sup> floor, Amar Colony, Lajpat Nagar, New Delhi 110 024 (hereinafter referred to as the "CONCESSIONAIRE" which expression shall include its successors and permitted assigns), of the SECOND PART.

### WHEREAS

#### Recitals

- (A) The Government of Gujarat has promulgated the Policy for Small / Mini / Micro Hydel Projects in Gujarat on 10<sup>th</sup> January, 2005 in order to promote the development of small / mini / micro hydel power generation in the state;
- (B) The State Government has promulgated the Gujarat Infrastructure Development Act, 1999 (the "GID Act, 1999") to create the legal framework for private sector participation in infrastructure projects in the State;
- (C) Following the provisions of the GID Act, Grantor solicited pre-qualification bids for short-listing private sector participants by issuing advertisements in this regard in national and international media;
- (D) Pursuant to the short-listing procedures ONE party was short-listed, and Request for Proposals ("RFP") were issued to him and ONE party submitted technical and financial bids.
- (E) After detailed evaluation of the bids of the party based on the technical and financial criteria specified in the RFP Messer's TARINI INFRASTRUCTURE Ltd (the "Developer" or "Successful Bidder" or "Concessionaire") was selected for implementing the Project, and a Letter of Intent ("LOI") was issued for implementing the Project and the Developer since the date of issue of the LOI has adhered to all conditions and taken all necessary steps to discharge all its responsibilities under the LOI;
- (F) The Concessionaire and it's Affiliates agrees to hold not less than 51 % of the paid up capital for the entire concession period.
- (G) Grantor has initiated steps for acquiring the land / already acquired the land for the Project and shall lease it to the Concessionaire;
- (H) Grantor and the Concessionaire now desire to enter into this agreement (the "Concession Agreement" or "this Agreement") to grant the Concessionaire the right to design, finance, build, operate, over the time and in the manner spelt out in the Schedule - 2 of this agreement, and in accordance with such further agreements, ancillary agreements as may be entered into between the parties and transfer the Project and all residual rights therein to Grantor on completion of the Concession Period;

Now therefore, in consideration of the mutual agreements herein contained, and of other good and valuable consideration, the receipt of which are hereby acknowledged, the parties hereto agree as follows:

FOR TARINI INFRASTRUCTURE LTD.

*[Signature]*  
DIRECTOR



## 1. Definitions and Interpretation

### 1.1 Definitions

**"Accounting Year"** means the accounting year for preparation of the annual statutory accounts of the Concessionaire;

**"Affiliates"** mean member companies of the M/S Tarini Group or its employees and its Directors and Associates Investors.

**"Arbitration Panel"** shall mean the panel appointed under the provisions of Section 19.4;

**"Asset Transfer Costs"** shall mean the indirect taxes, duties, cess, and other charges payable by the Concessionaire on transfer of the assets to Grantor or an entity nominated by Grantor;

**"Cause"** means (with respect to the revocation of any Specified Consent,) direct violation (by Concessionaire) of Specific Consent which is documented and certified Independent Engineer that after receiving a formal notice from the Relevant Authority, Concessionaire has not reasonably tried to rectified such violation.

**"Certificate of Compliance"** shall mean the certificate issued under the provisions of Section 3.2.1 of this Agreement;

**"Central Government"** shall mean the Government of Republic of India;

**"Concession"** shall mean the Concession granted to the Concessionaire under the provisions of this Agreement;

**"Concessionaire"** shall mean M/s Tarini Infrastructure Ltd., with its registered office at New Delhi.

**"Concessionaire Indemnified Loss"** shall mean the loss incurred by Grantor to be indemnified by the Concessionaire under the provisions of Section 15.1 ;

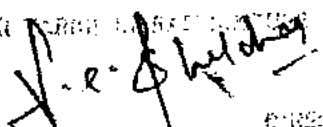
**"Concession Period"** shall mean the period so defined in Section 2.0 of this Agreement;

**"Conditions Precedent"** shall mean the conditions so defined in Section 3.1 of this Agreement;

**"Concessionaire Suspension Period"** shall mean period of suspension of the Termination Notice given by the Concessionaire to Grantor under the provisions of Section 12.5(f);

**"Construction Commencement Date"** as specified in Schedule 3 of this agreement and shall not be later than 90 days from the date of issuance of certificate of compliance;

**"Construction Contract(s)"** shall mean the agreement(s) entered into between the Concessionaire and its Construction Contractor for the construction of the Project Facilities;

FOR TARIINI INFRASTRUCTURE LTD.  
  
 DIRECTOR





**"Construction Contractor(s)"** shall mean contractor(s) appointed by the Concessionaire to construct the Project facilities in accordance with the provisions of this Agreement and their sub-contractors and their successors and permitted assigns;

**"Consultation Panel"** for dispute resolution appointed under the provisions of Section 19.2 of this Agreement;

**"Contractual Liabilities"** those duties, liabilities and obligations arising under the agreements or other document comprising Project Agreements, which continue after the Termination Date;

**"Construction Agreement"** means the agreement(s) between the Concessionaire and its Construction Contractor(s) for the construction, commissioning and testing of the Project Facilities.

**"Contractors"** means the Direct Contractors and their direct sub-contractors and their successors and permitted assigns;[ ]

**"Date of Completion"** means the date on which the Final Completion Certificate is issued;

**"Direct Government Political Event"** shall mean those events defined under Section 11.1.2 (a);

**"Dispute Resolution Procedure"** shall mean the procedure for resolution of disputes provided under Section 19;

**"Delay Event"** means events as specified in Section 5.5.1;

**"Design Data"** shall mean all data, reports, methodologies, manuals, guides and other data related to design, engineering, construction, completion and operation and maintenance of the Project;

**"Detailed Project Report"** or "DPR" shall mean report carried out in pursuance of Section 4.1.3;

**"Development Security"** shall mean the security furnished in accordance with the provisions of Section 4.1.8 of this Agreement;

**"Direct Contractors"** means the Construction Contractor, Operation and Maintenance Contractor(s) and their respective successors and assigns;

**"Discriminatory Action"** shall mean an action so defined in Section 11.1.2(a)(ii);

**"Eligible Share Capital"** shall mean yearly average of the opening and closing balance of the paid up and subscribed equity share capital of the Concessionaire, other than the equity and preference share capital subscribed and paid from Grantor or the Government of Gujarat (if any);

**"Force Majeure Event"** shall mean event so defined under Section 11 of this Agreement;

FOR TARIKI INFRASTRUCTURE LTD.

DIRECTOR

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**"Expiration Date"** shall mean the last date of Concession period on which this agreement terminates in accordance to the provisions of this Agreement, unless terminated earlier in accordance with this Agreement;

**"Final Inspection"** shall mean the inspection so conducted under Section 5.6.1 (e) of this Agreement;

**"Financial Bid"** shall mean the bid referred to in recital D of this Agreement

**"Final Completion"** shall mean the event of the issue of the Final Completion Certificate;

**"Final Completion Date"** shall mean the date on which the final completion certificate is issued under the provisions of this Agreement;

**"Final Completion Certificate"** shall mean the certificate issued under Section 5.6.1 (e) of this Agreement;

**"Financial Closure"** shall mean the coming into effect of the Financing Agreements with all the Lenders so that the Concessionaire has immediate access to the funds from the Lenders;

**"Financing Agreements"** means the agreements executed between the Concessionaire and the Lenders in respect of credit facilities made available by the Lenders to the Concessionaire for implementation of the Project;

**"Grantor Indemnified Loss"** shall mean the loss incurred by the Concessionaire to be indemnified by Grantor under the provisions of Section 15.2;

**"Grantor Suspension Period"** shall mean period of suspension of the Termination Notice so provided for under Section 12.5 (e);

**"Independent DPR Consultant"** shall mean a capable and competent to carry out the detailed project report of the Project, appointed in pursuance to Section 4.1.3 of this Agreement;

**"Independent Auditor"** shall mean the auditor or firm of auditors, permitted to carry out statutory audits under the law of India, appointed under the provisions of Section 5.8;

**"Independent Auditor's Agreement"** means the agreement entered into between [ ] and [ ] dated [ ].

**"Independent Engineer"** shall mean the engineer, or firm of engineers, appointed under the provisions of Section 5.8;

**"Independent Engineer's Agreement"** means the agreement entered into between Concessionaire and Independent Engineer dated [ ].

**"Infrastructure Act"** shall mean the Gujarat Infrastructure Development Act, 1999 and any subsequent amendment thereof;

*[Handwritten signature]*



"Investors" means the equity and preference shareholders in the Concessionaire, other than the Grantor and State Government;

"Land Lease Rental Payment Schedule" shall mean the schedule of discharge of the lease rental for the Project Site prescribed under Schedule 4 to this Agreement;

"Lease Rentals" means rentals so specified in the Land Lease Rental Payment Schedule and stated in Schedule 4 to this Agreement in accordance with the provisions of RFP;

"Lenders" shall mean financial institutions, banks funds, and agents or trustees of debenture holders, including their successors and assignees, who have agreed to guarantee or provide finance to the Concessionaire under any of the Financing Agreements for meeting the costs of all or any part of the Project and who hold priority security interest over the Project Site and Project Assets, the receivables, and the Project Agreements;

"Maintenance Period Insurance" shall mean the insurance cover to be taken by the Concessionaire under the provisions of Section 10.1(b);

"Material breach" means a breach by either party of any of its obligations in this agreement which has a Material adverse effect and which it fails to cure within the time available for that purpose in this agreement.

"Material Adverse Effect" means material adverse effect of any act or event on ability of either party to exercise its rights or perform any of its obligations, including but not limited to the physical or legal impossibility in regard to performance of such rights and obligations, under and in accordance with the provisions of this agreement other than as expressly authorized or permitted by this agreement.

"Natural Events" shall mean the events so defined under Section 11.1.1;

"Net Electrical Output" shall mean the total electricity generated, in units, delivered and measured at the interconnection point;

"Notice of Non-Compliance" shall mean the notice issued under Section 5.6.1(b);

"Other Consortium Members" means \_\_\_\_\_

"Political Events" shall mean the events so defined under Section 11.2;

"Preliminary Completion" shall mean the event of issue of the Preliminary Completion Certificate;

"Preliminary Completion Date" shall mean the date on which the Preliminary Completion Certificate is issued under Section 5.6.1(d);

"Preliminary Completion Notice" shall mean the notice so issued under Section 5.6.1(a);

"Preliminary Inspection" shall mean inspection carried as provided in Section 5.6.1(a);

FOR MARINI INFRASTRUCTURE LTD.

DIRECTOR





**"Project Site Lease Agreement"** shall mean the lease agreement dated between Grantor and the Concessionaire for the lease of the Project Site for the duration of the Concession Period;

**"Relevant Authorities"** shall mean the authorities indicated with respect to each specified consent in Schedule 1 to this Agreement;

**"Request for Proposal"** or **"RFP"** shall mean the document referred to in recital (D) of this Agreement;

**"Scheduled Bank"** shall mean a bank so defined under the Banking Regulations Act, 1949.

**"Scheduled Date of Completion"** with respect to each element of the Project Facilities shall mean the dates so specified in the Project Completion Schedule;

**"Shareholders' Agreement"** shall mean the agreement entered into between [Grantor], Concessionaire and other Shareholders with respect to matters governing their shareholding, and management and operation of the Concessionaire and buy out of shareholdings in the event of a termination;

**"Specified Consents"** shall mean all such approvals, consents, authorisations, notifications, acknowledgements, agreements, permits, decisions or other matters referred to in Schedule 1;

**"State Government (GoG)"** shall mean the State Government of Gujarat;

**"Statutory Entity"** means any judicial or quasi-judicial authority, governmental agency or authority of the State Government or Central Government;

**"Technical Bid"** shall mean the bid referred to in recital (D) of this Agreement;

**"Termination Amount"** shall mean the amount computed in pursuance to Section 13 of this Agreement payable to the Concessionaire in event of Termination of this Agreement;

**"Termination Date"** shall mean the date of issue of the Termination Notice by Grantor/Concessionaire;

**"Termination Rate of Return"** shall mean Prime Lending Rate + \_\_\_\_\_ basis point per annum computed annually;

**"Transfer Date"** shall mean date on which the assets are agreed to be transferred to Grantor in accordance with the provisions of this Agreement, which date shall not be more than 30 days from the Termination Date;

**"Vacant Possession"** in relation to any part of the Project Site shall mean the right to and delivery of exclusive possession thereof on a leasehold basis subject to:

- (i) the existing rights of public passage to be shown on the drawings;

FOR PARINI INFRASTRUCTURE LTD.  


DIRECTOR



(ii) the agreed or statutory rights of the Relevant Authorities to have access to the structures on or to be built upon the Site;

so that in respect of such rights no other person is in occupation, possession or use or has any claims to occupation, possession or use thereof;

## 1.2 Interpretation

In this Agreement:

- 1.2.1 Expressions defined in Section 1.1 shall bear the respective meanings set out therein;
- 1.2.2 The headings and paragraph numbering are for convenience only and shall be ignored in construing this Agreement;
- 1.2.3 The singular includes the plural and vice versa;
- 1.2.4 References to sections, recitals and schedules are, unless the context otherwise requires, references to sections of, and schedules and recitals to this Agreement, and
- 1.2.5 References to any agreement, enactment, ordinance or regulation includes any amendment thereof or any replacement in whole or in part.

FOR TARINI INFRASTRUCTURE LTD.

*J. C. Sheldar*  
DIRECTOR



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## 2. Commencement and Duration

The period of the Concession ("Concession Period") shall commence on the day of execution of this Agreement and shall be for a period of thirty five (35) years. Upon completion of the Concession Period or it is terminated pursuant to the provisions of this Agreement all rights and obligations under this Agreement shall lapse.

FOR TARIK INFRASTRUCTURE LTD.  
*[Signature]*  
DIRECTOR



### 3. Conditions Precedent

- I. The rights and obligations in Articles 3, 12,14,15,19 are binding on the parties from the date of this Agreement. The other rights and obligations under this Agreement are subject to the Conditions Precedent being satisfied or waived.

#### 3.1 Conditions precedents:

- 3.1.1 The acquisition and lease to Concessionaire by Grantor of the project site ("Project Site") as described in Schedule 5 of this Agreement;**
- 3.1.2 The obtaining of the Clearances and approvals ("Specified Consents") as described in the Schedule 1 by the concessionaire;**
- 3.1.3 Submission of DPR by the concessionaire prepared by a competent and qualified consultant ("DPR Consultant") in accordance with the provisions of the Schedule 2 within 4 months of signing of this agreement;**
- 3.1.4 Review and approval of the DPR by Grantor, provided the same has been submitted by the concessionaire as per Section 3.1.3 and incorporation of the terms and conditions of the DPR in this agreement and such other agreement as may be necessary; and**
- 3.1.5 Achievement of financial closure by the concessionaire.**
- 3.1.6 The Independent Engineer and the Independent Auditor must have been appointed.**

#### 3.2 Satisfaction of Conditions Precedent

- 3.2.1 Upon compliance in full of all conditions precedent set forth in Section 3.1 above the Concessionaire shall be obligated to issue to Grantor a Certificate of Compliance with Conditions Precedent (the "Certificate of Compliance"). The Concessionaire shall issue such Certificate within four (4) weeks of its determination that all conditions precedent set forth in Section 3.1 above have been complied with. In the event that the Concessionaire has not issued the Certificate of Compliance within four weeks Grantor can refer the matter to the Independent Engineer who shall then determine if the Certificate of Compliance can be issued or not. If the Independent Engineer is satisfied with documented evidence that a Certificate of Compliance can be issued it can issue the certificate to Grantor.**
- 3.2.2 Concessionaire and Grantor shall make best efforts to ensure that all the Conditions Precedent mentioned in Section 3.1 above are satisfied within a period of six months from the date of execution of this agreement.**
- 3.2.3 Notwithstanding anything contained in Section 3.1 to the contrary, any of the conditions precedent set forth in Section 3.1 above may be waived by an agreement in writing between Grantor and Concessionaire, provided, however, that the Concessionaire shall have been granted or obtained all Specified Consents that are required to be obtained prior to commencement of the construction and; provided**

FOR TARIK INFRASTRUCTURE LTD.

*X. C. Fletcher*

DIRECTOR





further that no such waiver shall be construed as a waiver by either party of any of its rights under this Agreement. Grantor may waive conditions set forth in 3.1.3, 3.1.4, 3.1.5 and 3.1.7. The concessionaire may waive the conditions set forth in 3.1.1. Both the parties can jointly waive the condition set forth in 3.1.6.

- 3.2.4 If the Conditions Precedent are not fully satisfied or waived within a period of six months from the date of execution of this Agreement Either Party shall be entitled to terminate, at its discretion, the agreement pursuant to the provisions of Section 13.2 of this Agreement.
- 3.2.5 The time limit, as set forth in Section 3.2.4, may be extended by either party, at its discretion, upon receiving such request by other party, in writing, for the reasons which are beyond the control of the requesting party or for such other genuine reasons or under any other provision of this agreement. However, such an extension shall not exceed six (6) month, under any circumstances except for the event of force majeure, where such an extension would be granted as per the provision of Section 11.4. If the condition precedents are not fully satisfied or waived even after such extension period is over, then either party shall terminate this agreement pursuant to the provisions of Section 13.2 of this agreement.

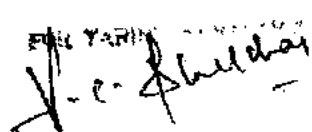
FOR TARINI INFRASTRUCTURE LTD.  
*[Signature]*  
DIRECTOR



## 4. Project Development Stage

### 4.1 Obligations of the Concessionaire.

- 4.1.1 The concessionaire shall pay the project development expenses of Rs. \_\_\_\_\_, as specified in the RFP document, to the Grantor within 30 days of signing of this agreement. If the concessionaire fails to pay the project development expenses to Grantor within stipulated time, he same would be considered as material breach of the agreement and Grantor can forfeit the Bid / development security to recover the project development expenses. Grantor may also terminate the agreement.
- 4.1.2 The concessionaire shall develop the financing plan for the Project and carry out all necessary steps for Financial Closure, which shall be the sole responsibility of the Concessionaire;
- 4.1.3 The Concessionaire shall be responsible for carrying out a DPR for the Project by the Independent DPR Consultant to be appointed by the Concessionaire. The costs and fees payable to the Independent DPR Consultant for the DPR would be payable by the Concessionaire. The DPR would, on its approval and acceptance by Grantor (or by CEA, as per the Electricity Act, 2003), form the final technical specifications of the Project and would form an integral part of this agreement. The DPR shall be completed within a period of six months from the execution of this Agreement;
- 4.1.4 The Concessionaire hereby agrees that though Grantor may review the terms of such further agreements as the Construction Contract, the Financing Agreement, and Operations and Maintenance Agreement and other Agreements.
- 4.1.5 The Concessionaire shall make all applications (whether initial or renewal applications) for the Specified Consents referred to in Schedule 1 in the prescribed form and with the prescribed fee to the appropriate authorities ("Relevant Authorities") and shall diligently pursue all such applications with a view to obtaining the relevant Specified Consents as expeditiously as possible. The information supplied in the applications shall be complete and accurate so far as the Project, the Concessionaire, and other interested parties are concerned, and shall satisfy the substantive and procedural requirements of the applicable laws of the State Government and the Central Government and other Relevant Authorities.
- 4.1.6 The Governments/Relevant Authorities may attach such terms and conditions to the Specified Consents (each a "Consent") as are in accordance with the laws of India having due regard to the importance of the Project to the State of Gujarat and also India as a whole. The Concessionaire shall abide by such terms and conditions and shall use its reasonable endeavors to cause the Lenders and the Direct Contractors to abide by all such terms and conditions. Grantor shall as far as possible make best efforts to ensure that the State Government shall not attach to any Consent, subsequent to its grant, any terms or conditions which materially and adversely affect the rights of the Concessionaire, Lenders and Contractors or any of their obligations under the Financing Agreement.

For YASH  




4.1.7 If any Consent required under the Laws of the State of Gujarat or Central Government for Concessionaire, the Lenders or the Direct Contractors with respect to the Project lapse, or expires, or is terminated, the Concessionaire shall make or cause to be made a renewal application for that Consent and Sections 4.1.5, 4.1.6, and 4.2.7 shall mutatis mutandis apply thereto; provided that Grantor shall as far as possible make best efforts to ensure that Government shall not attach to the renewed Consent terms and conditions less favorable to the Concessionaire, the Lenders or the Contractors than those attached to the Consent which it replaces. Notwithstanding the foregoing, the Governments shall not be required to grant any renewal application, and Grantor shall not be obligated to ensure the granting/renewal thereof if the previous corresponding consent was revoked for a valid Cause."

#### 4.1.8 Development Security

The concessionaire is required to provide in favor of Grantor the Development Security of 5% of the project cost as specified in the DPR and certified by the Independent Auditor. The Development Security shall be provided in the form of an irrevocable bank guarantee. The development security shall be provided in two installments: The first installment of 25% of the development security shall be provided within 30 days from the signing of this Agreement, and the remaining amount (75% of the development security) shall be provided before 30 days of the Scheduled date of Construction Commencement. Till the date the first installment of the development security is provided, Grantor shall keep the bid security and upon submission of the development security (25%), Grantor shall release the bid security.

The appropriate amount of the Development Security shall be forfeited if the Concessionaire fails to construct the Project in accordance with the provisions of this Agreement or the LOI issued to the Developer, as the case may be.

Irrevocable guarantee to be provided for Development Security shall be from a scheduled bank or Insurance Company and honorable/payable in India through Scheduled Bank/Insurance Company. The format of irrevocable guarantee shall be within the format prescribed by the RFP.

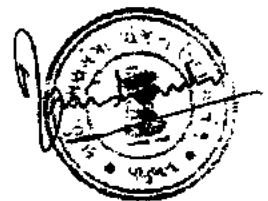
Failure to provide and maintain the Development Security by the concessionaire as above shall be construed as a material breach of this Agreement by the Concessionaire.

Note : In case the DPR is not completed and available at the time of first installment, the project cost as submitted by the bidder in his RFP shall be taken into account. In such case, the amount of the development security shall be arrived at once the DPR is approved by the grantor. The variations in the amount of development security, if any, shall be taken care of at the time of receiving second installment by the Grantor.

FOR TARINI INFRASTRUCTURE LTD.

*[Handwritten Signature]*

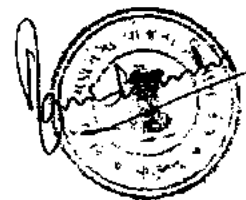
DIRECTOR



• 4.2 **Obligations of Grantor/GoG**

- 4.2.1 Grantor / GoG hereby grants the Concessionaire by way of lease of the Project Site, use of water to generate the power, the exclusive right to develop, design, finance, construct and complete, the Project in accordance with the Schedule 2 and operate and maintain the same, and transfer at the end of the Concession Period to Grantor the Project Assets in accordance with the terms and conditions of this Agreement for the duration of the Concession.
- 4.2.2 The concessionaire will have no right to claim release of water and the release of water shall be controlled by the Narmada Water Resources Department (Grantor ) subject to the condition that all the water requirement ( viz. irrigation, industrial, water supply and other schemes which are based on the assured supply from Damanganga Reservoir and any unforeseen water requirement arising during the year ) for the water year (July to June) shall be fully met and available water could be put to optimum use for Hydro Power Generation. There is no guarantee even by the Grantor regarding the minimum quantity / flow of water from the Dam..
- 4.2.3 Grantor shall grant at its own cost and expense, to the Concessionaire, Vacant Possession of the Project Site against payment of the lease rentals for the Project Site as per the agreed schedule ("Project Site Lease Rental Schedule").
- 4.2.4 Grantor shall lease to Concessionaire the Project Site under a valid and binding lease agreement (the "Project Site Lease Agreement"). The said Project Site Lease Agreement shall be duly executed and registered with the competent authorities. The lease rent of the land shall be as stated in Schedule 4 to this Agreement.
- 4.2.5 Grantor shall make best efforts to cause the State Government to grant, such permission or exemption, as may be required under the laws relating to and regulating land as applicable in the State of Gujarat so as to ensure that the Concessionaire can enjoy Vacant Possession and hold the area of land comprising the Project Site during the duration of the Concession.
- 4.2.6 Grantor shall cause the State Government to ensure that the Concessionaire is free to carry out the construction, operation and maintenance of the Project, in accordance with the provisions of this Agreement. The Concessionaire shall notify Grantor of impediments, legal or physical, which are not attributable to the Concessionaire or any of the sub-contractors employed by the Concessionaire, to the construction, financing and operation and maintenance of the Project and Grantor shall act so as to remove such impediments which are not attributable to the Concessionaire. If such impediments are not removed within a period of thirty (30) days from the date of such notice, it shall be condition of Delay under Section 5.5.1(b).
- 4.2.7 Grantor / GoG shall make best efforts to promote and support all such applications for the Specified Consents so as to expedite the consideration thereof by the Relevant Authorities and make best efforts for ensuring their approval by the Relevant Authorities.

FOR TARIFF INFRASTRUCTURE DEPT.  
*[Signature]*  
D. P. S. R.



## 5. Design, Engineering and Construction

### 5.1 Design Tests and Site Inspection

#### 5.1.1 The Concessionaire shall be deemed to have:

- (a) inspected and examined the Project Site and its surroundings;
- (b) satisfied itself (so far as practicable and having taken into account any information in connection therewith which may have been provided by Grantor) as to the nature of the general conditions of the Project Site, the nature of the ground and subsoil, the form and nature of the Project Site, the risk of injury or damage to property affecting the Project Site, the nature of the materials (whether natural or otherwise) to be excavated and the nature of the design work and materials necessary for the execution of the works related to the development of the project; and
- (c) Satisfied itself as to the means of communication and access to and through the Project Site and accommodation it may require, the possibility of interference by persons (other than Grantor and other than persons claiming rights or title through, under or paramount to Grantor), with access to the Project Site after the Concessionaire shall have been given Vacant Possession with particular regard to the Relevant Authorities, and the precautions and times and methods of working necessary to prevent any nuisance or interference, whether public or private, being caused to any interested parties.

#### 5.1.2 Responsibilities of Concessionaire

The Concessionaire shall be solely responsible for any deficiency in the design of the Project. The failure of Grantor to object to any design, design drawing or specifications or change thereto shall not be construed to be a waiver by Grantor of any of its rights under this Agreement or in any way relieve the Concessionaire of any of its obligations. In furtherance of the above, the Concessionaire:

- (a) accepts that no review conducted by or approval of Grantor with respect to the design of the Project Facilities will relieve the Concessionaire of any of its obligations under this Agreement, and that Grantor undertakes no responsibility as to the quality of engineering or construction of the Project Facilities or any component thereof;
- (b) shall in no way represent to any third party that, as result of any review by Grantor, Grantor is responsible for the engineering or construction soundness of the Project Facilities or any component thereof; and
- (c) shall be solely responsible for the technical feasibility, operational capability and reliability of the Project Facilities and each component thereof. The hydrological and other data provided by Grantor are based on its assessments and studies. The concessionaire shall make its own judgment about the

FOR TANGI INFRASTRUCTURE LTD.

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DIRECTOR



technical feasibility of the project and conduct a survey if felt necessary. Grantor will not be responsible for any mismatch of the data provided with actual data.

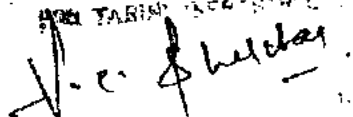
- (d) The Grantor shall provide the design data which are correct as per the information available with the Grantor.

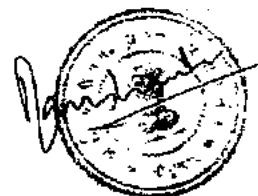
## 5.2 Construction

Subject to the terms of this Agreement the Concessionaire shall design and construct the Project in accordance with the Prudent Utility Practices, relevant technical standards and specification and also in line with the provisions of Approved DPR, after obtaining all requisite approvals. The Company shall achieve Commercial Operation of the Project within Scheduled Commercial Operation Date and ensure that the Project is capable of being Dispatched delivering Active and Reactive Power and of being operated in parallel with the Grid System as per Prudent Utility Practices. The Concessionaire shall assume all costs and risks of the construction of the Project Facilities in accordance with this Agreement.

### 5.2.1 Detailed Responsibilities of the Concessionaire

- (a) Upon issuance of the Certificate of Compliance under Section 3.2.1 the Concessionaire shall commence the construction work on the Project Facilities on a date ("Date of Construction Commencement") within three months from the date of the Certificate of Compliance. The Project Completion Schedule defined in Schedule 3 shall be determined with reference to the Effective Date of this Agreement;
- (b) The Concessionaire hereby agrees not to grant any person access to the Project Site, except for the purpose of carrying out any construction, building or laying of any structures or utilities;
- (c) The concessionaire shall be responsible for performing the construction in accordance with:
  - (i) all applicable laws;
  - (ii) the detailed designs as per approved DPR;
  - (iii) all other requirements of this Agreement
- (d) The concessionaire should give priority to safety in its construction methods and activities in order to protect life, health and property and the environment;
- (e) The concessionaire should take all reasonable measures to minimise disruption and other inconvenience to the public and area residents and business during construction;

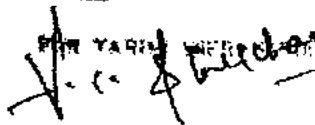
FOR TARIFF REGULATION  




- (f) The concessionaire shall be responsible for applying for and obtaining in a timely manner and maintaining the approvals for the construction of the Project;
- (g) The Concessionaire shall be responsible for laying the power evacuation lines of appropriate voltage from the generation station to the nearest sub station of the State Transmission utility. In case, augmentation of a sub station is necessary the entire cost for the same shall be paid by the Concessionaire. Maintenance of the transmission line shall be carried out by the State Transmission Utility whenever required, at the cost of the Concessionaire or alternatively, the concessionaire shall carry out the maintenance on its own.
- (h) The Concessionaire shall enter into a separate agreement with the State Transmission Utility within a period of six (6) months from the Effective Date for execution, operation and maintenance of the Interconnection Facilities. The agreement shall inter-alia lay down the details of the Interconnection Facilities and also the charges and other terms and conditions for the execution, operation and maintenance of the Interconnection Facilities.
- (i) The Concessionaire shall provide at the Station, at its cost, suitable arrangements, compatible with the Grid System and as may be approved by the State Transmission Utility, for parallel operation with the Grid System as per Prudent Utility Practices and also for automatic isolation of the Project from the Grid System in the event of any fault on the Grid System and ensure that no damage is caused to the Project due to aforesaid.
- (j) For proper and prompt co-ordination and efficient load management, the concessionaire shall provide and maintain adequate and reliable communication system between the Power Station and \_\_\_ kV sub-station of the State Transmission Utility at \_\_\_\_\_.
- (k) **Construction Power:** The Concessionaire shall make its own arrangements for meeting the power requirements of the Project during the construction period. Grantor may help the concessionaire in getting the construction power from the state owned Distribution Company operating in the area.

### 5.3 No Liability for Project Site risk

For the avoidance of doubt, notwithstanding the ground, physical and hydrological and geophysical investigations and such further design and testing as may be appropriate, the Concessionaire shall not be entitled to make any claim against Grantor whether in damages or for extension of time for completion in excess of three months (save in accordance with this Agreement) on the grounds of any misunderstanding or misapprehension in respect of the matters referred to Section 5.1 or on the grounds that incorrect or insufficient information relating thereto or the Project Site was given to it by any person, whether or not in the employment of Grantor.

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#### 5.4 No Liability for Tender Data

Save as expressly provided in this Agreement, the Concessionaire shall not seek to recover from Grantor any losses or damages which may arise from the use or application, by or on behalf of Concessionaire, or the Concessionaire, in the design and construction of the Project Facilities, of the data issued to it or its representatives in connection with the Project and/or Project Facilities by or on behalf of Grantor before or during the tender stages for the Project

#### 5.5 Extension of time for Completion of the works

##### 5.5.1 Delay Events shall mean the following:

- (a) Force Majeure Event pursuant to Sections 11 of this agreement;
- (b) Failure of the Grantor to grant Vacant Possession of the Project Site together with the ancillary easementary rights.;
- (c) Any other breach by Grantor of its obligations under this Agreement;
- (d) Any delay caused by Grantor without due cause in commenting and approving the DPR;
- (e) Interruptions to the construction of the Project Facilities suffered due to intervention by the State Government or the Central Government or other statutory entity.

5.5.2 The Concessionaire shall give notice in writing to Grantor as soon as it can foresee a Delay Event occurring which will cause material delay to, or materially impede completion of the Project Facilities in time for the Scheduled Date of Completion, or, if the same is not foreseeable, as soon as it shall become aware of such Delay Event. Thereafter, but not later than 28 days after such notification, the Concessionaire shall give further written details to Grantor and the Independent Engineer which shall include:

- (a) a statement of which Delay Event the claim is based upon;
- (b) details of the circumstances from which the delay or impediment arises;
- (c) details of the contemporary records which the Concessionaire will maintain to substantiate its claims;
- (d) details of the consequences whether direct or indirect which such delay; or impediment may have upon completion of the Project Facilities; and
- (e) details of any measures which the Concessionaire proposes to adopt to mitigate the consequences of delay or impediment.

5.5.3 Grantor and the Independent Engineer will, after receipt of written details under Section 5.5.2, be entitled by notice in writing to require the Concessionaire to provide such further supporting particulars as it may reasonably consider necessary.

5.5.4 Subject to the Concessionaire complying with Section 5.5.2 and subject to the Concessionaire putting forward proposals where required pursuant to Section 5.5.2(e) as to the reasonable steps which it intends to take in order to mitigate any delay, and provided the delay cause is material, Grantor shall, on recommendation

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*T. E. & L. Ltd.*





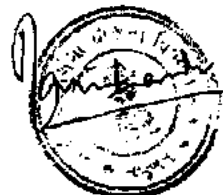
of the Independent Engineer, as soon as reasonably practicable, grant to the Concessionaire in writing (either prospectively or retrospectively) such extension of the period or periods identified in the Project Completion Schedule to achieve the issue of Preliminary Certificate of Completion as the Independent Engineer considers necessary and shall fix a revised Scheduled Date for Completion. If Grantor on recommendation of the Independent Engineer declines to grant an extension of time as aforesaid or the Concessionaire considers that the extension is insufficient then the Concessionaire shall be entitled to refer the matter to the Dispute Resolution Procedure specified in Section 19.

## 5.6 Completion of Project Facilities and Synchronisation

### 5.6.1 Completion of Project Facilities

- a) The Concessionaire shall give Grantor not less than 30 (thirty) day's prior written notice (the "Preliminary Completion Notice") of the date on which the Concessionaire considers the Project will achieve Preliminary Completion as defined in the Schedule 3. On receiving the notice Grantor shall arrange an inspection of the Project Facilities by the Independent Engineer to confirm that the construction work has been completed and Project Facilities have been constructed and installed in accordance with this Agreement and relevant regulations ("Preliminary Inspection").
- b) Upon completion of the Preliminary Inspection Grantor, based on Independent Engineer's report, shall issue a written notice to the Concessionaire that the construction work is in accordance with this Agreement or advise the Concessionaire of any Non-compliance ("Notice of Non-Compliance"). If Grantor fails to issue a Notice of Non-Compliance within a period of 15 (fifteen) days of the Preliminary Inspection then it shall be deemed that the results of the preliminary inspection were satisfactory to Grantor.
- c) If the Project Facilities do not pass the Preliminary Inspection and if a Notice of Non-compliance is issued under Section 5.6.2 the Concessionaire shall take all necessary corrective action to remedy such non-compliance and then repeat the process of Preliminary Inspection. The Concessionaire shall be responsible for any increase in costs or delay resulting from such corrective action and for the costs incurred by the Parties in repeating the inspection.
- d) Upon expiry of the notice period following the delivery of the Preliminary Inspection Notice, provided the Independent Engineer is satisfied with the results of the Preliminary Inspection it shall issue a written notice to the Concessionaire that no further construction work is required. Grantor shall then issue a Preliminary Completion Certificate ("Preliminary Completion Certificate"). If Grantor does not issue the Preliminary Completion Certificate or deliver a notice of Non-Compliance under Section 5.6.1(b) then the Preliminary Completion Certificate shall be deemed to have been issued on the day after the expiry of 20 (twenty days) from the expiry of the notice period for Preliminary Inspection.

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- e) Within \_\_\_\_\_ months from the issue of the Preliminary Completion Certificate under Section 5.6.1 (d) the Independent Engineer shall conduct the Final Inspection ("Final Inspection") to confirm that the Project Facilities conform to the specifications and standards set out in this Agreement. Upon satisfactory completion of the Final Inspection by the Independent Engineer Grantor shall issue a certificate to the Concessionaire of Final Completion ("Certificate of Final Completion"). If the Project Facilities do not pass the Final Inspection then Grantor shall issue a Notice of Non-Compliance and the Concessionaire shall be responsible for remedying such non-compliance at his own cost. The procedure for Final Inspection shall be repeated thereafter. The Concessionaire shall be responsible for any increase in costs or delay resulting from such corrective action.
- f) The procedure for Preliminary Inspection and Final Inspection and provision for remedying the defects and deficiencies is without prejudice to the right of Grantor to levy liquidated damages for failure of the Concessionaire to complete the Project Facilities by the Scheduled Date of Completion under this Agreement or the rights of Grantor to claim of damages for breach of this Agreement by the Concessionaire or any claim under any warranty and guarantee issued by the Concessionaire.

#### 5.6.2 Synchronisation

- a) The concessionaire shall be responsible for availing Open Access permissions from the respective nodal agency to transmit the electricity using the existing transmission Network of the State Transmission utility or a transmission licensee operating in the area.
- b) The concessionaire shall be responsible for creating evacuation facilities up to the nearest Interconnection Point.
- c) The concessionaire shall enter into a Transmission agreement with the State Transmission utility or a transmission licensee. All the aspects related to transmission of energy i.e. synchronizations of the units, evacuation of power, wheeling charges etc. shall be governed by the said transmission agreement.

#### 5.7 Progress Reports

From the date of this Agreement until the issue of Certificate of Completion, the Concessionaire shall submit to Grantor a quarterly progress report in such form as may be agreed between the parties. Any change to the form of the quarterly progress report shall be agreed with Grantor in the regular quarterly meetings to be held relating to such reports. After completion of the project quarterly operating reports shall be submitted to Grantor in a form as may be agreed.

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## 5.8 Independent Engineer and Independent Auditor

- 5.8.1 The Independent Engineer and Independent Auditor shall be appointed within six months from the date hereto pursuant to the Independent Engineer's Agreement and Independent Auditor's Agreement jointly by Grantor and the Concessionaire for the period required to complete the Project Facilities and for such further period during the Concession Period necessary under the provisions of this Agreement.
- 5.8.2 The costs and expenses relating to the work of the Independent Engineer and Independent Auditor shall be borne equally by the Concessionaire and Grantor.
- 5.8.3 Grantor and the concessionaire shall be entitled to consult with the Independent Engineer and Independent Auditor on any matter relating to the project.
- 5.8.4 The Independent Engineer and Independent Auditor shall report directly to Grantor. Neither party shall not be entitled to prohibit or hinder the delivery by the Independent Engineer or Independent Auditor of such reports and information to any party.

## 5.9 Amendments to Independent Engineering Agreement

- 5.9.1 The Independent Engineers Agreement shall not be amended or departed from without the prior written consent of both the parties. Copies of proposed amendments and departures shall be submitted by the party suggesting the amendments to the other party not later than 28 days before it is intended to give effect to the same other than in the case of an emergency in which case the party shall deliver such copies as soon as reasonably practicable.
- 5.9.2 If any party shall have failed to raise objection to such an amendment or departure within 28 days of receipt of the relevant documentation (or such shorter period as may be specified in the event of emergency) then it shall be precluded from doing so.

## 5.10 Liquidated Damages

- 5.10.1 If other than through the default of Grantor or the State Government or Central Government or any other statutory body, the Project and/or Project Facilities are not in a state that the Certificate of Completion in terms of this Agreement can be issued by the Independent Engineer by the Scheduled Date of Completion as defined in Schedule 3, then Grantor can, without prejudice to the continuing obligation of the Concessionaire to complete the Project Facilities, shall be entitled to payment by the Concessionaire of a liquidated damages. The amount of liquidated damages shall be equal to the daily amount of the payment of the license fee per unit by the concessionaire to Grantor / GoG. The parties hereby agree that notwithstanding anything contained in this Agreement liquidated damages specified herein are a genuine estimate of the loss suffered by Grantor as a result of any delay in the completion of the construction of the Project.

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5.10.2 For the purpose of calculation of liquidated damages, the Independent auditor shall use Installed Capacity as Name Plate capacity of the Plant as per DPR, Capacity Utilisation : \_\_\_\_\_ % and the license fees per unit as bided by the developer and as specified in Section 8.

#### 5.11 Release of the Development Security

After final completion date, the concessionaire shall make a request to Grantor for release of the development security along with the particulars thereof. Grantor shall release the Development Security within 30 days from the receipt of such request.

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*[Signature]*  
DIRECTOR



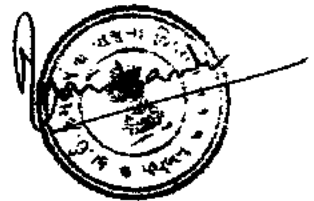
## 6 Sale of Power

- 6.1 The concessionaire can use the electricity generated from the power project for its own captive consumption. If the concessionaire does not want to use the electricity generated for captive consumption or he has excess capacity available, he can sale the electricity generated from the power project to Gujarat Electricity Board (GEB) or any / all of its successors. The sale of electricity and the tariff which can be charged shall be determined by Gujarat Electricity Regulatory Commission (GERC as per the power granted under the Electricity Act, 2003 and the Gujarat Electricity Industry (Reorganisation & Regulation) act 2003). Third party sale of electricity is not permitted by the state government as of now. The same shall be governed by the policy of Government of Gujarat from time to time.
- 6.2 The concessionaire shall also ensure delivery of power at the Interconnection Point in a safe and reliable manner so as to avoid fluctuations and disturbances to the Grid System due to parallel operation.
- 6.3 The concessionaire shall be responsible for taking any permissions/licenses from any of the authority in order to sale the power.
- 6.4 Concessionaire hereby agrees that, he will enter into long term supply agreement with any user only for the maximum period of the Concession Agreement less the construction period. The concessionaire shall not enter into any agreement for supply of electricity with any user to supply the electricity beyond the Concession Period.
- 6.5 The Grantor may provide assistance on best efforts basis to the concessionaire in order to seek any transmission facility from the state transmission utility.

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## 7 Operation and Maintenance of the Project Facilities

7.1 Subject to the provisions of the Agreement, the Concessionaire shall operate and maintain, and if required, effect improvement (within the overall scope of the Project implementation) in the Project in accordance with:

- (i) Prudent Utility Practices;
- (ii) all applicable Laws and directives;
- (iii) the manuals, instructions and manufacturers' guidelines supplied by construction contractors, manufacturers of equipments/suppliers etc;
- (iv) the Grid Technical Limits;
- (v) Dispatch Instructions issued by State Load Dispatch Center; and
- (vi) rated capacity subject to normal derating/ deterioration.

### 7.2 Maintenance of Records

The concessionaire shall keep complete and accurate records and all other data required for the purposes of proper administration of the Agreement. Among other records and data required hereby or elsewhere in the Agreement, the concessionaire shall maintain an accurate and up-to-date operating log at the Project/Interconnection Point as per Prudent Utility Practices including records of:

- (a) Active and Reactive Power production for each hour at all times and the Energy generated/received on hourly basis;
- (b) Scheduled Outages, Maintenance Outages and Forced Outages;
- (c) Outage of the Generating Unit(s), other than the Scheduled Outage, Maintenance Outage and Forced Outage, but attributed to the following or any one of the following:-
  - i) Grid System failure.
  - ii) Non availability of evacuation system beyond the Interconnection Point.
  - iii) Receipt of backing down instructions from the Control Centre.
- (d) Any unusual condition observed during operation/ inspection(s).

All such records shall be maintained for a minimum of sixty (60) months after the creation of such record or data. Grantor / GoG / or any other Government Agency shall have the right, upon reasonable prior notice to the concessionaire, and at reasonable times, to examine such records and data maintained by the Concessionaire.

### 7.3 Failure to Maintain

7.3.1 If in the opinion of the Independent Engineer the Concessionaire is in breach of its obligations to maintain the Project Facilities in accordance with the provisions of

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DIRECTOR



this agreement, Grantor may give notice of the breach to the Concessionaire. On receipt of such notice, the Concessionaire shall perform the necessary corrective action and remedy the breach within a period to be specified by the Independent Engineer.

- 7.3.2 If the failure of the Concessionaire to maintain is such that it is violation of the minimum stipulated provisions of the obligations of the Concessionaire, and the Concessionaire has not remedied the breach within a period so specified under Section 7.3.1 above Grantor shall treat the breach as a material breach under this Agreement and shall be entitled to terminate this Agreement.

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*P. C. Phelan*

DIRECTOR



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## 8 License fees and Lease rental.

### 8.1 License Fees

- 8.1.1 The concessionaire shall pay to Grantor the license fees as per his Financial Bid. Accordingly, the concessionaire shall pay to the Grantor an amount equal to Rs. 0.23 ( twenty three paise ) per unit of the electricity generated and transmitted to the interconnection point.
- 8.1.2 The license fee is payable at the end of each quarter for the Net Electrical out put generated during that quarter. The license fee payment due to Grantor / GoG shall be computed every three months by the Independent Auditor and payable to Grantor / GoG within a period of 30 (thirty) days of the final determination thereof. Any delay in payment of the Royalty to Grantor / GoG by the Concessionaire shall, beyond the period of 30 days, attract interest at the rate of Prime Lending Rate + 5% per annum.
- 8.1.3 The Concessionaire shall be responsible for installing the Metering System, its inspection and testing, and recording the Net Electrical Output generated by the Power Station and delivered at the Interconnection Point.
- 8.1.4 The concessionaire shall supply the details of daily units generated and supplied at the Interconnection points to the Independent auditors. The independent auditors shall certify the information which shall be used for calculating the license fee.

### 8.2 Lease Rental for Land

The Concessionaire shall be required to pay the Grantor the lease charges for the land as per Schedule 4 to this Agreement. The premium and monthly lease rental shall be discharged in accordance with the provisions of the Lease Agreement for the Project Site between Grantor and the Concessionaire. The lease rental shall be payable quarterly along with the payment of the License fees.

### 8.3 Escrow Account

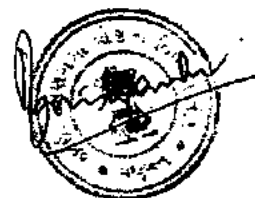
The Concessionaire shall create an escrow account to be managed by a Scheduled Bank where certain percentage of the monthly cash inflows of the Concessionaire shall be deposited. The amount so deposited in the escrow account shall be sufficient to cover the quarterly payment to Grantor for the license fees and lease rental. The Independent Auditor shall certify that amount deposited in the escrow account is sufficient to recover the quarterly payments. The amount accumulated in the escrow account for a period of three months shall be utilised towards discharging the liability of the Concessionaire towards Grantor / GoG for the license fee payment and lease rental payment.

### 8.4 Penalty for late payment

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*[Signature]*

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If the concessionaire fail to make the payment for the aforementioned items, within the time period specified, the concessionaire shall be liable to pay the Grantor penalty at the rate of Prime Lending Rate + 5 % as penal interest rate for the period of delay.

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*[Signature]*  
DIRECTOR



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## 9 Representations and Warranties

### 9.1 Representations and Warranties of each Party to the Other

Each Party hereby represents and warrants to the other Parties that:

- (a) it is duly constituted, validly existing and in good standing under the laws of the jurisdiction of its incorporation;
- (b) it has full powers and authority to execute, deliver and perform its obligations under this Agreement and to carry out the transactions contemplated hereby;
- (c) it has taken all necessary action to authorise the execution, delivery and performance of this Agreement; and
- (d) this Agreement constitutes the legal, valid and binding obligation of it, enforceable against it in accordance with the terms hereof;

### 9.2 Specific Representations and Warranties of Grantor

Grantor further represents that:

- (a) the land acquisition proceedings in respect of the Project Site shall be complete and final as per the applicable statutes (excluding remedy of the affected persons to go to the court for challenging the quantum of compensation alone i.e. with regard to vesting of property in the government and the title on the same is unassailable) and that the Concessionaire shall have vacant possession of the Project as on the Construction Commencement Date;
- (b) there is no litigation, claim, demand or any proceeding pending before any authority in respect of the title of the land constituting the Project Site subject to Section 9.2 (a);
- (c) it has the necessary permissions and authority from the State Government for granting the Concessionaire the necessary permits and clearances.

### 9.3 The Concessionaire further warrants that it would take all steps to ensure that it is fit and capable of design, engineering, financing, construction and marketing of the project.

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*[Signature]*  
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## 10 Insurance

10.1 The Concessionaire shall maintain or cause to be maintained all necessary insurance covers required to be maintained as specified hereunder:

a) Construction Insurance

The Concessionaire shall effect and maintain, or cause to be effected and maintained, at no cost to Grantor during the Construction Period such insurances upto such maximum sums as may be required under and in accordance with the Financing Documents, Applicable Laws and such insurance as the Concessionaire may reasonably consider necessary or desirable in accordance with Good Industry Practice. The Concessionaire shall also effect and maintain such insurance as may be necessary for mitigating the risks that may devolve on Grantor as a consequence of any act of omission by the Concessionaire during the Construction Period. The concessionaire shall take all the requisite insurances prior to Construction Commencement, and supply such evidence of compliance as may be required by Grantor.

b) Operation, Maintenance Insurance

Not later than 4 (four) months prior to the anticipated Completion of the Project, the Concessionaire shall obtain and maintain at no cost to Grantor during the Operations Period in respect of the Project and its operations such insurance as may be required under any of the Financing Documents, Applicable Laws and such insurance as the Concessionaire may reasonably consider necessary or desirable in accordance with Good Industry Practice.

10.2 The Concessionaire shall also procure or caused to be procured insurance of the Project Facilities during the subsistence of the Concession Period.

10.3 The cost and expenses of insurance shall be borne by the Concessionaire.

10.4 If the Concessionaire fails to obtain the specified insurance covers, concessionaire shall be responsible for any liabilities arising from non-compliance and Grantor / GoG shall not be responsible for any liability arising from such negligence of concessionaire.

10.5 The Concessionaire shall ensure that it applies the insurance proceeds it receives for reinstatement or repair of the physical damages suffered by the Project Facilities.

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*[Signature]*

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## 11 Force Majeure Events

### 11.1 Meaning of Force Majeure Event

In this Agreement, "*Force Majeure Event*" means any event or circumstance or any combination of events or circumstances beyond the reasonable control of either party which, or any effect of which, (a) materially and adversely affects the performance by that party of its obligations or the enjoyment by that party of its rights under or pursuant to this Agreement or (b) causes that party to incur a material additional or increased cost (including debt service) or a material reduction in, or deferral of, its income; Provided, that the same has not occurred due to the failure of the Concessionaire to develop, design, finance, insure, construct, complete and operate and maintain the Project Facilities to such standards and specifications and following prudent practices or due to failure of Grantor to carry out its obligations under this agreement.

Without limitation to the generality of the foregoing, "*Force Majeure Event*" shall include the following events and circumstances and their effects to the extent that they, or their effects, satisfy the above requirements:

#### 11.1.1 Natural events ("*Natural Events*") to the extent they satisfy the foregoing requirements including, but not limited to:

- (a) any material effect on the natural elements, including lightning, fire, earthquake, cyclone, flood, storm, tornado, or typhoon;
- (b) explosion or chemical contamination (other than resulting from an act of war);
- (c) epidemic or plague; and
- (d) any event or circumstance of a nature analogous to any of the foregoing.

#### 11.1.2 Other Force Majeure Events ("*Political Events*") to the extent that they satisfy the foregoing requirements including, but not limited to:-

- (a) Political Events which involve directly the State Government and the Central Government ("*Direct Government Political Event*"), including, but not limited to:
  - (i) The expropriation, nationalisation or compulsory acquisition by the State Government or Central Government or any political agency or subdivision thereof in Gujarat or India of any material assets or rights of the Concessionaire;
  - (ii) Any Discriminatory Action by the State Government

A Discriminatory Action shall occur if:

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DIRECTOR



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The State Government or Other Statutory Entity takes action of any nature whatsoever after the date hereof, including the introduction or application of any law, decree or regulation, or fails to carry out its obligations as prescribed by law, the principal effect of which is directly or indirectly borne by the Concessionaire and only incidentally by other persons and, such action materially or adversely affects the economic position of the Concessionaire, except where such action or omission is in response to any act or omission on the part of the Concessionaire which is illegal (other than an act or omission rendered illegal by virtue of Discriminatory Action of the State Government), or in violation of agreements in which the Concessionaire is a party; and

(iii) Change in law other than those specified in Section 18;

(iv) Any event or circumstance of a nature analogous to any of the foregoing.

(b) Political Events which occur inside the State of Gujarat and the Republic of India or involve the State Government and/or the Central Government ("*Indirect Political Events*") including, but not limited to:

(i) Act of war (whether declared or un-declared), invasion, armed conflict or act of foreign enemy, blockade, embargo, revolution, riot, insurrection, civil commotion, or act of terrorism;

(ii) Radioactive contamination

(iii) Strikes, work to rule, go-slows

(iv) Any event or circumstance of a nature analogous to any of the foregoing

11.1.3 Force Majeure Events shall expressly not include the following conditions, except to the extent resulting from a Force Majeure Event:

(a) Late delivery of plant, machinery, construction equipment, raw materials, spare parts, or consumables; or

(b) A delay or default by any party to any agreement or other document comprising the Financing Agreement, other than the Concessionaire, Grantor, the State Government or Central Government or any other Statutory Entity, in the performance of the obligations there under.

## 11.2 Notification of Obligations

11.2.1 A party affected by the Force Majeure Event shall give notice to the other party of such Force Majeure Event as soon as reasonably practicable, but not later than fifteen (15) working days after (i) the commencement of the Force

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*[Signature]*

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Majeure Event causing loss or damage to the Project, or (ii) the date on which such party knew or should reasonably have known of the commencement of an Force Majeure Event which causes loss of or damage to the Project; Provided that, notwithstanding the above, if the Force Majeure Event results in a breakdown of communications rendering it not reasonably practicable to give notice within the applicable time limit specified therein, then such party shall give such notice as soon as reasonably practicable after the reinstatement of communications, but not later than three (3) working day after the reinstatement of communications.

11.2.2 The party affected by the Force Majeure Event shall give notice to the other party of (i) the cessation of the relevant Force Majeure Event, and (ii) the cessation of the effects of such Force Majeure Event on the enjoyment by such party of its rights or the performance by it of its obligations under this Agreement as soon as practicable after becoming aware of each of (i) and (ii) above, but, in each case (subject, *mutatis mutandis*, to the proviso the Section 11.2.1), within seven (7) working days after becoming so aware.

11.2.3 Neither party shall be excused pursuant to Section 11.4 for any failure or delay in complying with its obligations under or pursuant to this Agreement until the notice mentioned in Section 11.2.1 shall have been given to the other party; Provided that, if the said notice shall have been given within the period mentioned in Section 11.2.1 the party affected by the Force Majeure Event shall be excused for such failure or delay pursuant to Section 11.4 from the commencement of the relevant Force Majeure Event.

### 11.3 Mitigation and Reports

The party affected by the Force Majeure Event shall use its reasonable endeavors to mitigate the effects of any Force Majeure Event affecting the enjoyment by such party of its rights or the performance by it of its obligations under this Agreement. The affected party shall furnish weekly written reports to the other party with respect to its progress in overcoming the effects of the event or circumstance of a Force Majeure Event together with such supporting and information.

### 11.4 Delay caused by Force Majeure Events

11.4.1 Subject as provided in Section 11.2.3 neither party shall be liable for any failure or delay in complying with any of its obligations (other than an obligation to make any payment) under or pursuant to this Agreement to the extent that such a failure or delay has been caused, or contributed to, by one or more Force Majeure Events or its or their effects or by combination thereof.

11.4.2 Where Section 11.4.1 applies, the periods allowed for the performance by the relevant party of the obligations(s) referred to in Section 11.4.1, the Project Completion Schedule shall, subject to Section 11.3, be extended day-for-day for so long as one or more Force Majeure Events or its or their effects continues either (a) to affect materially and adversely the performance by such party of such obligation(s) under or pursuant to this Agreement or (b) to cause

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DIRECTOR Page 36 of 69



that party to incur a material additional or increased cost (including debt service) or a material reduction in or deferral of its income.

11.4.3 Notwithstanding the provisions of Section 11.4.1 and 11.4.2 no relief shall be granted to either party pursuant to this Section 11.4 to the extent that such failure or delay would have nevertheless been experienced by such party had such Force Majeure Event or its effect not occurred.

11.4.4 Other than the obligations mentioned in Section 11.5 and 11.6 or for payment under Section 22, Grantor shall not bear any liability for any loss or expense suffered by the Concessionaire as a result of a Force Majeure Event or its effects. Other than the obligations mentioned in Section 11.5 and without prejudice to Grantor's remedies under Section 13, Concessionaire shall not bear any liability for any loss or expense suffered by Grantor as a result of an Force Majeure Event or its effects.

#### 11.5 Termination as a result of Force Majeure Event

In case an Force Majeure Event subsists for a period of 180 (one hundred eighty days or more within a continuous period of 365 (three hundred sixty five) days and affects a party the other party shall instruct the Independent Engineer to submit its report on the cost of the event, technical and financial viability of restoring the Project Facilities. If in the case of any Force Majeure Event the Independent Engineer determines that the restoration of the Project Facilities is not technically or financially viable, this Agreement shall thereupon terminate and relevant provisions of Section 13 shall thereupon apply.

#### 11.6 Dispute Resolution

In the event that the parties are unable to agree in good faith about the occurrence or existence of a Force Majeure Event, such dispute shall be finally settled in accordance with the Dispute Resolution Procedure, provided, however, that the burden of proof as to the occurrence or existence of such Force Majeure Event shall be upon the Party claiming relief and/or excuse on account of such Force Majeure Event.

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*[Signature]*  
 DIRECTOR



## 12 Termination

### 12.1 Termination due to non-fulfillment of Conditions Precedent

- a) The Concessionaire shall use their reasonable endeavors to procure the fulfillment of the conditions set out in Section 3.1.2 and 3.1.6 on or before the date falling Six (6) months after the signing of this Agreement; provided that the parties may extend this date by mutual agreement up to further maximum period of six months. Party may terminate this Agreement by giving notice of such termination to the other party of, notwithstanding that the parties hereto have used their reasonable endeavors as aforesaid, such conditions are not fulfilled by the said date. Upon the giving of notice of termination under this paragraph, this Agreement shall immediately terminate.
- b) The Concessionaire shall use their reasonable endeavors to procure the fulfillment of the conditions set out in Section 3.1.3 and 3.1.5 on or before the date falling Six (6) months after the signing of this Agreement; provided that the parties may extend this date by mutual agreement up to further maximum period of six months. Grantor may terminate this Agreement by giving notice of such termination to the Concessionaire of, notwithstanding that the parties hereto have used their reasonable endeavors as aforesaid, such conditions are not fulfilled by the said date. Upon the giving of notice of termination under this paragraph, this Agreement shall immediately terminate.
- c) Grantor shall use their reasonable endeavors to procure the fulfillment of the conditions set out in Section 3.1.1 and Section 3.1.4 on or before the date falling Six (6) months after the signing of this Agreement; provided that the parties may extend this date by mutual agreement up to further maximum period of six months. Concessionaire may terminate this Agreement by giving notice of such termination to the Grantor of, notwithstanding that the parties hereto have used their reasonable endeavors as aforesaid, such conditions are not fulfilled by the said date. Upon the giving of notice of termination under this paragraph, this Agreement shall immediately terminate.
- d) If this Agreement is terminated by virtue of the non-fulfillment of the condition precedent set out in Section 3.1.2 and 3.1.6 neither party shall have any liability to the other under this Agreement or otherwise by virtue thereof.

### 12.2 Termination on Expiration Date

The expiration date of this Agreement shall be the last date of the Concession Period ("Expiration Date"). This agreement shall terminate on the Expiration Date.

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DIRECTOR



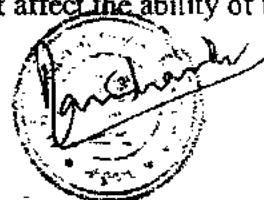


## 12.3 Termination by Grantor:

Grantor may give the Concessionaire a notice of intended termination of this agreement upon the occurrence of the following events (each such event a "*Concessionaire Event of Default*") unless resulting from a Force Majeure Event, a breach by Grantor of this agreement, a Grantor event of default, there under:

- (a) the failure of the Concessionaire to achieve (i) the Preliminary Completion Date for the Project within three months after the date originally specified in the program appearing as the Project Completion Schedule in Schedule 3 to this Agreement (ii) the successful operation of the Project within one month after the date originally specified in the above program (iii) the substantial completion of restoration works required to be carried out following the occurrence of an Force Majeure Event by the date beyond which it is agreed between the parties or determined by the Independent Engineer that Grantor shall be entitled to terminate this agreement pursuant to this Section (unless there shall have been a supervening Force Majeure Event);
- (b) after the commencement of construction of the Project Facilities as certified by the Independent Engineer the abandonment by the Concessionaire of the construction of the Project for more than Ninety (90) days as certified by the Independent Engineer without the written consent of Grantor, Provided the Concessionaire shall not be deemed to have abandoned the construction of the Project if it gives written notice stating in reasonable detail the facts for the satisfaction and approval of the Independent Engineer and Grantor and takes appropriate measures that it needs to take to proceed with construction of the Project and continues to take such measures until such measures are no longer required;
- (a) if the Project Facilities are designed, constructed or completed (i) in a manner that materially deviates from the Schedule 2 or DPR, or (ii) in material violation of any applicable law or (iii) the Concessionaire does not explain the reasonable and appropriate measures that it intends to take to cure any such material violation or deviation and does not begin and thereafter continue to take such measures until such measures are no longer required;
- (b) if the Concessionaire willfully or recklessly fails in a material respect to operate and maintain the Project Facilities during the Concession Period following prudent practices and to the satisfaction of the Independent Engineer within 21 days of the Independent Engineer serving notice stating in reasonable detail the facts that forms the basis of this assertion and the Concessionaire fails to explain the reasonable and appropriate measures that it intends to take to cure such material failure and does not begin and thereafter continue to take such measures until such measures are no longer required;
- (c) the transfer, pursuant to any law, of either (i) the rights and/or obligations of the Concessionaire hereunder, or (ii) all or a substantial portion of the undertaking of the Concessionaire, except where such transferee is approved by Grantor in accordance with this Agreement and such transfer does not affect the ability of the

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transferee to perform its obligations under this Agreement and provided such transferee expressly assumes such obligation;

- (d) the Concessionaire shall assign or purport to assign, directly or indirectly, its rights and its obligations under this Agreement or transfer its assets without the prior written consent of Grantor in accordance with this Agreement;
- (e) the Concessionaire repudiates this Agreement or evidences in any manner its intention not to perform under, or to be bound by this Agreement;
- (f) the Developer and/or its Affiliates shall cease to own directly or indirectly at least 51% of the subscribed and paid up capital of the Concessionaire;
- (j) After the Completion Date as defined in this Agreement, the shareholders' funds of the Concessionaire are less than the amounts so specified in the Shareholders Agreement; as stated below:
  - i. during the construction period, 51 per cent of the total equity funds by the Concessionaire are in place;
  - ii. after the Final Completion Date the concessionaire and the consortium must held 51% of the equity of the project, out of which the developer must held the majority of the stake (within the consortium) at any point of time during the concession period.
- (k) except for the purpose of any compromise or arrangement or amalgamation or reconstruction (provided, that such amalgamation or reconstruction does not affect the ability of the amalgamated or reconstructed entity, as the case may be, to perform its obligations under this agreement and in any event the terms of such compromise or arrangement or amalgamation or reconstruction as the case may be are approved by Grantor in writing), the occurrence of any of the following events:
  - (i) the passing of a resolution by the shareholders, creditors of the Concessionaire for the winding up of the Concessionaire
  - (ii) the appointment of a liquidator in a proceeding for the winding up of the company and due hearing, which appointment has not been set aside or stayed within ninety (90) days of such appointment; or
  - (iii) the making by the Court of an order winding up of the Concessionaire.
- (l) any material breach by the Concessionaire of this Agreement, such as would entitle Grantor to treat such agreement as having been repudiated by the Concessionaire in accordance with the provisions of Section 12.5 (e) of notice from Grantor stating that a material breach of the agreement has occurred.

Grantor shall deliver to the lenders' representative a copy of any notice given under this Section 12.3 on the same date that it delivers that notice to the Concessionaire.

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*[Signature]*  
DIRECTOR



#### 12.4 Termination by Concessionaire

The Concessionaire may give to Grantor a notice of intended termination of this agreement upon the occurrence of any of the following events (each a "*Grantor Event of Default*") unless resulting from a Force Majeure Event, a breach by the Concessionaire of this Agreement.

Any fundamental breach or default by Grantor of this Agreement such as would entitle the Concessionaire to treat this Agreement as having then been repudiated by Grantor, which is not remedied within ninety (90) days of notice from the Concessionaire to Grantor identifying the fundamental breach or default in question in reasonable detail and demanding remedy thereof,

#### 12.5 Termination Notices

- a) A notice of termination given pursuant to Section 12.3 or 12.4 (each a "Preliminary Termination Notice") shall specify in reasonable detail the Concessionaire Event of Default or Grantor Event of Default, as the case may be, giving rise to the Preliminary Termination Notice.
- b) Following the giving of a Preliminary Termination Notice, the parties shall consult for a period of up to three (3) months (or such longer period as they may agree) as to what steps shall be taken with a view to mitigating the consequences of the relevant event having regard to all the circumstances.
- c) At the expiration of the said period and unless the parties shall have otherwise agreed or the event giving rise to the Preliminary Termination Notice shall have been remedied, the party having given the Preliminary Termination Notice may terminate this agreement by giving written notice (a "Termination Notice") to the other party and to the Lenders' representative or trustee whereupon, subject to paragraph (d) below, this Agreement shall terminate and Section 13 shall apply.
- d) Substitution of Nominated Company
  - i) Upon the giving of a Preliminary Termination Notice by Grantor pursuant to Section 12.3, the lenders shall be entitled to substitute another Concessionaire ("Nominated Party") for the Concessionaire under this Agreement in accordance with the following provisions of this Section.
  - ii) Subject to clause (vi) below, within forty five (45) days after the date on which Grantor gives a Preliminary Termination Notice, a substitution notice ("Substitution Notice") may be given to Grantor by and on behalf of the Lenders holding in excess of fifty (50) per cent of the then outstanding amount under the Financing Agreements. The Substitution Notice shall indicate the Party which is proposed to continue this Agreement in place of the Concessionaire.
  - iii) Upon receipt by Grantor of a Substitution Notice, Grantor and the relevant Lenders shall consult for a period of twenty-one (21) days as to the entity which is to be the Nominated Party. On or before the expiration of that

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DIRECTOR

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consultation period, Grantor shall have the right to reject the entity proposed in the Substitution Notice if it is not reasonably satisfied that such entity has the financial and technical capability to continue the construction and/or operation of the Project or if Grantor determines, in its sole discretion, that the substitution of the Concessionaire would prejudice the public interest of the State of Gujarat and/or Government of India. If Grantor shall so reject the company proposed in the Substitution Notice, Grantor and the relevant Lenders shall continue to consult for further twenty-one (21) days as to an alternative party to be the Nominated Party subject to Grantor's right to reject such alternative entity for the reasons specified in the previous sentence.

- iv) At the end of the periods specified in sub clause (iii) above, (unless Grantor shall have rejected all parties proposed by the Lenders), (a) Grantor and the Nominated Party shall forthwith execute a novation of this Agreement, (b) Grantor shall procure the execution of novations, *mutatis mutandis*, in substantially the same form, in favor of the Nominated Party of the relevant and applicable Project Agreements, provided no such novations shall be executed or take effect unless the Nominated Party shall have at the same time entered into novations of such agreements and entered into such other agreements and documents as are required by the Lenders.
- v) At the end of the period(s) specified in sub-clause (iii), if Grantor shall have, in accordance with sub-clause (iii) rejected all companies proposed by the relevant Lenders, unless Grantor and the relevant Lenders otherwise agree, this Agreement shall terminate in accordance with Section 12 as if no Substitution Notice has been given.
- vi) No Substitution Notice may be given, and accordingly no further substitution may take place under this sub section unless the parties otherwise agree, if there shall previously have been three (3) or more Nominated Companies with which Grantor has entered into novation pursuant to sub clause (iv).
- e) A Preliminary Termination Notice given to the Concessionaire in accordance with paragraph (a) above shall be suspended for a period of 3 (three) months from the Termination Notice (the "Grantor Suspension Period"); provided that the Suspension Period shall immediately terminate, upon notice from Grantor to the Concessionaire and the Lenders fail to use their reasonable endeavors to remedy the relevant Concessionaire Event of Default or to return the Project to such physical and operational condition as Grantor may reasonably require. During the Grantor Suspension Period, the Lenders shall be entitled either to remedy the relevant Concessionaire Event of Default to Grantor's reasonable satisfaction or, at the Lenders' option, to return the Project to such physical and operational condition as Grantor may reasonably require. If the Concessionaire Event of Default is so remedied or the Lenders return the Project to such physical and operational condition as Grantor may reasonably require, this Agreement shall continue after the Grantor Suspension Period as if no Preliminary Termination Notice had been given.
- f) A Preliminary Termination Notice given to Grantor in accordance with (a) above shall remain suspended for 3 (three) months from the Termination Notice

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*[Signature]*

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DIRECTOR





("Concessionaire Suspension Period"); During the Concessionaire Suspension Period the Grantor shall be entitled to remedy the relevant Grantor Event of Default to the Concessionaire's reasonable satisfaction . If the Grantor Event of Default is so remedied this Agreement shall continue after the Concessionaire Suspension Period as if no Preliminary Termination Notice had been given.

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*[Signature]*  
DIRECTOR



### 13 Consequences of Termination

#### 13.1 Termination of project due to expiry of concession period

If this agreement terminates pursuant to Sections 12.2:

- a) No Termination Amount shall be payable to the Concessionaire by Grantor;
- b) The Concessionaire shall transfer the Project Assets as defined in Section 13.2 to Grantor at the Depreciated Historical Cost (DHC) of the project.
- c) Grantor shall have no obligation to assume or discharge the Project Liabilities or the Contractual Liabilities which are due prior to the expiration date.

#### 13.2 Termination due to non-fulfillment of condition precedents.

- a) If the agreement is terminated pursuant to Section 12.1(a), no part shall any liability of any payments. Grantor shall return the development security / bid security to the concessionaire.
- b) If the agreement is terminated pursuant to Section 12.1(b), Grantor shall forfeit the development security / bid security. Also the concessionaire shall be liable to reimburse Grantor, the actual development expenses incurred by Grantor, till the date of termination, as certified by Independent Auditor ;
- c) If the agreement is terminated pursuant to Section 12.1(c), Grantor shall reimburse to the concessionaire the actual cost incurred by the concessionaire till the date of termination of this agreement. The concessionaire must provide all the documentary evidence to show that he has actually incurred the cost. Also the Independent Auditor shall certify the cost. Grantor shall also return to the concessionaire the development security / bid security.

#### 13.3 Termination for Concessionaire Event of Default:

If this Agreement terminates pursuant to Section 12.3:

- a) No Termination Amount shall be payable to the Concessionaire by Grantor;
- b) The Concessionaire shall transfer the Project Assets to Grantor or to its designee within thirty (30) days after the Termination Date;
- c) Grantor shall assume and discharge the Project Liabilities and the Contractual Liabilities;

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*[Signature]*



This is without prejudice to the right of Grantor to claim damages for breach of this Agreement by the Concessionaire.

#### 13.4 Termination by Concessionaire for Grantor Event of Default or Direct Political Events:

If this Agreement terminates pursuant to Section 11.1.2 (a) or 12.4, on the Transfer Date:

If the termination is after Commencement of Construction but before Preliminary Completion of Construction:

- a) Grantor shall pay to the Concessionaire an amount equal to the subscribed and paid up Share Capital subscribed of the Concessionaire ("Eligible Share Capital") and an allowed Termination Equity Rate of Return ("Termination Equity Rate of Return") per annum thereon up to the date of termination;
- b) The Concessionaire shall transfer the Project Work in Progress and Project Assets to Grantor or its designee within thirty (30) days after the Termination Date;
- c) Grantor shall assume all Project Liabilities and contractual Liabilities and bear all Asset Transfer Costs.

If the termination is after the issue of Preliminary Certificate of Completion:

- a) Grantor shall pay to the Concessionaire an amount equal to Termination Value computed in accordance to in Schedule 6 to this agreement so as to allow the shareholders a rate of return at the rate of Termination Rate of Return on the Eligible Share Capital;
- b) The Concessionaire shall transfer the Project Assets to Grantor or to its designee;
- c) Grantor shall assume and discharge the Project Liabilities and the Contractual Liabilities and bear all Asset Transfer Costs;

#### 13.5 Termination for Natural Events affecting the Project

If this Agreement terminates pursuant to Section 11.1.1 as a result of a Natural Event causing loss of or damage to the Project where (a) the parties agree to terminate this Agreement or (b) the Independent Engineer appointed pursuant determines that the continuation of the Project is not technically and financially viable, on the Transfer Date:

- a) No Termination Amount shall be payable to the Concessionaire by Grantor;
- b) The Concessionaire shall transfer the Project Assets to Grantor, or to its designee, at Grantor's discretion at an agreed assessed Recoverable Value of the assets to be assessed and certified by the Independent Engineer and Independent Auditor;

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*J. C. Pheasant*

DIRECTOR



- c) Grantor shall have no obligation to assume or discharge the Project Liabilities or the Contractual Liabilities.

#### 13.6 Termination for Indirect Government Political Events:

If this Agreement terminates pursuant to Section 11.1.2 (b) as a result of a Indirect Political Event;

- a) No termination amount shall be payable by Grantor to the Concessionaire;
- b) The Concessionaire shall transfer the project asset to Grantor or its designee, Grantor's discretion at Depreciated Historical Cost as certified by the Independent Engineer and Independent Auditor;
- c) Grantor shall assume or discharge the Project Liabilities or the Contractual Liabilities.

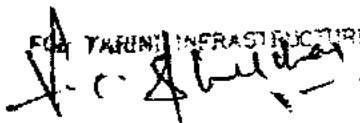
#### 13.7 Transfer of Project Assets

13.7.1 From and after the Termination Date until the Transfer Date, Grantor shall have the right to cause, and the Concessionaire shall permit, independent consultants, retained by Grantor at its expense, to enter upon the Project Site at reasonable times, and upon reasonable notice to perform such inspections, studies and tests as are necessary or appropriate to enable Grantor to assess the condition of the site and/or the Project. On or before the Transfer Date, Grantor may instruct the Concessionaire to transfer the Project Assets to Grantor or its designee on the Transfer Date.

13.7.2 The transfer of assets shall be free and clear from all charges, mortgages, pledges, security interests, encumbrances or other liens created by the Concessionaire in favor of its Lenders; the Concessionaire shall transfer to Grantor all such representations and warranties that are capable of such transfer and that exist for the benefit of the Concessionaire on the Termination Date relating to any Project Assets transferred to Grantor hereunder, including, but not limited to, representations and warranties of title and marketability, fitness for purpose, merchantable quality, compliance with legal or other requirements, maintenance, condition and repair, whether express or implied.

13.7.3 Project Assets transferred shall include:

- (i) Project Site and Project Facilities constructed by Concessionaire;
- (ii) all rights to receive future revenues from the Project;
- (iii) all other proceeds due to the Concessionaire (including but not limited to insurance proceeds and damages) related to the Project Assets;
- (iv) all equipment, software, hardware, fittings, spare parts, stocks and other property used in connection with the Project Facilities;

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- (v) all cash and bank balances and investments and other instruments owned;
- (vi) all technology or know-how required to operate and maintain the Project Facilities as per DPR;
- (vii) the benefit of all un-expired warranties, insurance and other contracts (to the extent assignable); and
- (viii) all manuals, drawings, documentation and information with respect to the Project Facilities.

13.7.4 The Concessionaire shall execute and deliver and, where capable of registration, register with the relevant authorities of the State Government and the Central Government such agreements and other instruments as Grantor may reasonably request in order to perfect the transfer of the Project Assets pursuant to this Section 13.

13.7.5 The Concessionaire shall remain exclusively responsible for all liabilities in connection with the Project other than those expressly assumed by Grantor.

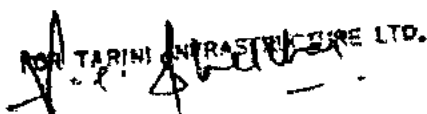
13.7.6 If the transfer occurs before the Final Completion Date, the Concessionaire shall warrant that all work performed to the termination date shall have been performed in accordance with the requirements of the applicable laws and this Agreement, and the Development Security shall remain in force for a period of 12 (twelve) months after the date of transfer.

13.7.7 If the transfer occurs after the Final Completion Date the Concessionaire's warranty as to the performance, condition and quality of the Project Facilities shall survive the termination and continue in effect until the date which is the earlier of: (i) the date which is twelve months following the termination (ii) the expiry of the defects liability period in accordance with this Agreement. The Concessionaire shall ensure that the Development Security remains in effect during such period to secure the Concessionaire's obligations in respect of such warranties. However, after transfer of the project, if the performance deteriorates due to negligence in operation, the same shall not be covered under the said clause and the concessionaire shall not be held responsible for the same..

### 13.8 Assumption of Project Liabilities and Contractual Obligations:

13.8.1 When the Concessionaire transfers the Project Assets to Grantor or its designee pursuant to Section 13.7:

- (a) Grantor or its designee shall assume all right, title and interest in the Project Assets so transferred without affecting the continuing rights of the Users of the Project Facilities and Project Site granted in accordance with this Agreement;
- (b) Grantor or its designee shall assume the Project Liabilities and the Contractual Obligations if provided for under the circumstances of the transfer in Section 13.1 to 13.6 above, and

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DIRECTOR



- (c) Grantor shall use its reasonable endeavors to procure the Concessionaire's release from the Assigned Agreements.

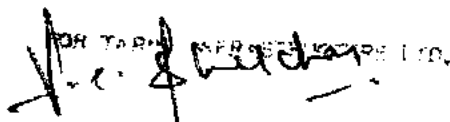
13.8.2 Grantor shall indemnify the Concessionaire against (a) the Project Liabilities, (b) the Contractual Obligations, and (c) all claims, costs, expenses, liabilities, losses and obligations arising from the Project Assets after the Transfer Date.

### 13.9 Satisfaction and Release

**13.9.1 Except as provided in Section 13.9.3, if the termination of this Agreement arises from a Grantor Event of Default or an Force Majeure Event or the effects thereof, the payment of the Termination Amount and, when the Project Assets are transferred to Grantor pursuant to Section 13.7.1, (a) the assumption and discharge of the Project Liabilities and the Contractual obligations by Grantor and (b) the performance by Grantor of its obligations to indemnify the Concessionaire shall be full satisfaction of Grantor's and any other statutory entity's obligations to the Concessionaire under any agreement or other document comprising the Project Agreements but shall be without prejudice to any rights or obligations under any such agreement or other document of the Concessionaire, Grantor or any statutory entity accrued prior to such termination (other than as a result of the event giving rise to termination or to the extent not reflected in the calculation of the Termination Amount) and any claims in respect thereof, which shall be unaffected by the termination of this Agreement and the payment of any amounts provided for in this Section. The Concessionaire shall release and discharge Grantor and all statutory entities from all obligations that are expressed in this Section 13.9.1 to be fully satisfied. References to rights of the Concessionaire shall be construed to include rights of the Investors enforceable under this agreement.**

13.9.2 If the termination of this Agreement arises from a Concessionaire Event of Default or an Force Majeure Event or the effects thereof, the transfer to Grantor of the Project Assets, where so provided in Section 13, and the exercise of the rights of recourse provided in Section 13.10 shall be full satisfaction of the Concessionaire's obligations to Grantor or any statutory entity accrued prior to such termination (other than as a result of the event giving rise to termination) and any claims in respect thereof, which shall be unaffected by the termination of this Agreement and the transfer of the Project Assets and exercise of the said rights of recourse. Grantor shall release and discharge the Concessionaire, and Grantor shall make best efforts to ensure that any statutory entity releases the Concessionaire, from all obligations which are expressed in this Section 13.9.2 to be fully satisfied.

13.9.3 If this Agreement is terminated as a result of Grantor Event of Default in Section 12.4 or an Force Majeure Event specified in Section 11.1.2(a) and, in either case, the relevant shares or assets include assets of the Concessionaire that are not comprised in the Project Assets, or in the case of shares, any value

FOR TARIK  
  
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DIRECTOR



attributable thereto, in addition to receiving the Termination Amount pursuant to this Section 13, Concessionaire may pursue such other remedies as may be available to it under any applicable law with respect to obtaining redress or compensation for such assets or shares.

#### 13.10 Survival of Rights and Obligations:

Notwithstanding anything to the contrary contained in this Agreement, the rights and obligations of the Parties under this Agreement which by their nature survive the termination of this Agreement (e.g., the obligations under Sections 13,14,15 and 19 etc.), shall not be extinguished by termination of this Agreement.

#### 13.11 Material Breach and Suspension

**13.11.1** If the Concessionaire shall be in Material Breach of this Agreement Grantor shall be entitled in its sole discretion and without prejudice to its other rights and remedies under this Agreement including its right of Termination hereunder, to (i) suspend all or any of the rights of the Concessionaire under this Agreement including the Concessionaire's right to collect the Revenues from the Project Facilities, and (ii) exercise the rights of the Concessionaire under this Agreement itself or authorise any other person to exercise the same during such suspension. Such suspension by Grantor shall be by a communication in writing to the Concessionaire and shall be effective forthwith upon the issue thereof to the Concessionaire. Any Fees or revenues collected by or on behalf of Grantor during such suspension shall be retained and appropriated by Grantor to the exclusion of the Concessionaire. Provided, however, that the period of such suspension under this Section 13.11.1 shall not exceed 120 (one hundred twenty) days:

**13.11.2** Subject to Section 13.11.1, Grantor shall have the right to utilise the proceeds of the Revenues, directly collected by the Concessionaire, for meeting the costs incurred by Grantor to remedy and rectify the cause of such suspension and for defraying the O&M Expenses in accordance with the Operation and Maintenance Agreement during such suspension period. Provided, however, that if the Concessionaire is making diligent efforts to remedy and rectify such cause, then Grantor shall allow the Concessionaire reasonable time and opportunity for such remedy or rectification.

**13.11.3** The suspension of the rights of the Concessionaire by Grantor pursuant to Section 13.11.1 above shall be revoked by Grantor forthwith upon the Concessionaire having remedied the Material Breach during such suspension period to the satisfaction of Grantor unless in the meantime this Agreement has been terminated by Grantor in accordance with Section 12.3.

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*[Handwritten signature]*



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13.11.4 At any time during the period of suspension, the Concessionaire may in writing notify to Grantor that it does not intend to cure the breach or default that had caused such suspension. Within 7 (seven) days of receipt of such notice, Grantor shall terminate this Agreement.

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*[Signature]*  
DIRECTOR



## 14 Intellectual Property and Confidentiality

### 14.1 Intellectual Property

The Concessionaire shall make available to Grantor for use free of charge, except where the same is vested in a third party, in which case the Concessionaire shall use all prudent commercial endeavors to procure that they are so made available, all Design Data and all other materials, documents and data of any nature acquired or brought into existence for the purposes of the design or construction of the Project Facilities or the operation, maintenance and improvement of the Project Facilities and which might reasonably be required by Grantor for the purposes of carrying out its duties under this Agreement or any statutory duties which the State Government and/or Central Government may entrust on it. Grantor will have ready and free access to such property developed at any time in the future.

### 14.2 Confidential Information

- II. Subject to Article 14.3, both parties shall at all times both during the Term and for [ ] years following the termination or expiry of this Agreement:
- III. (i) use their reasonable endeavours to keep all information regarding the terms and conditions of this Agreement and any data or information acquired as a result of the negotiation and performance of this Agreement confidential and accordingly neither party shall disclose the same to any other person; and
- IV. (ii) not use any document or other information (whether technical or commercial) obtained by them respectively as a result of the negotiation and performance of this Agreement or concerning the other's undertaking for any purpose other than performance of the party's obligations and exercise of its rights under this Agreement,
- V. provided that the provisions of this Article 14.2 shall not apply to:
  - VI.(a) any information which at the time of disclosure was in the public domain other than by breach of the confidentiality obligations of this Article 14.2;
  - VII.(b) information relating to the Project in the possession of a party before that information was disclosed to it by or on behalf of the other party and which was not obtained under any obligation of confidentiality; and
  - VIII.(c) information obtained from a third party who is free to disclose the same, and which is not obtained under any obligation of confidentiality.

### 14.3 Disclosure of Confidential Information

- IX. Either party shall be entitled to disclose the terms and conditions of this Agreement and any data or information acquired by it under or pursuant to this

FOR *[Signature]*  
 DIRECTOR



## 14 Intellectual Property and Confidentiality

### 14.1 Intellectual Property

The Concessionaire shall make available to Grantor for use free of charge, except where the same is vested in a third party, in which case the Concessionaire shall use all prudent commercial endeavors to procure that they are so made available, all Design Data and all other materials, documents and data of any nature acquired or brought into existence for the purposes of the design or construction of the Project Facilities or the operation, maintenance and improvement of the Project Facilities and which might reasonably be required by Grantor for the purposes of carrying out its duties under this Agreement or any statutory duties which the State Government and/or Central Government may entrust on it. Grantor will have ready and free access to such property developed at any time in the future.

### 14.2 Confidential Information

- II. Subject to Article 14.3, both parties shall at all times both during the Term and for [ ] years following the termination or expiry of this Agreement:
- III. (i) use their reasonable endeavours to keep all information regarding the terms and conditions of this Agreement and any data or information acquired as a result of the negotiation and performance of this Agreement confidential and accordingly neither party shall disclose the same to any other person; and
- IV. (ii) not use any document or other information (whether technical or commercial) obtained by them respectively as a result of the negotiation and performance of this Agreement or concerning the other's undertaking for any purpose other than performance of the party's obligations and exercise of its rights under this Agreement,
- V. provided that the provisions of this Article 14.2 shall not apply to:
  - VI.(a) any information which at the time of disclosure was in the public domain other than by breach of the confidentiality obligations of this Article 14.2;
  - VII.(b) information relating to the Project in the possession of a party before that information was disclosed to it by or on behalf of the other party and which was not obtained under any obligation of confidentiality; and
  - VIII.(c) information obtained from a third party who is free to disclose the same, and which is not obtained under any obligation of confidentiality.

### 14.3 Disclosure of Confidential Information

- IX. Either party shall be entitled to disclose the terms and conditions of this Agreement and any data or information acquired by it under or pursuant to this

FOR *[Signature]*  
 DIRECTOR



Agreement without the prior written consent of the other party if such disclosure is made in good faith:

- X. (i) to any affiliate of such party, having made it aware of the requirements of this Article or to any Indian Governmental Instrumentality; or
- XI. (ii) to any outside consultants or advisers engaged by or on behalf of such party and acting in that capacity, having made them aware of the requirements of this Article; or
- XII. (iii) to the Lenders, having made them aware of the requirements of this Article; or
- XIII. (iv) to the extent required by the rules of a relevant and recognised stock exchange; or
- XIV. (v) to the extent required by any applicable Law or pursuant to an order of any court of competent jurisdiction; or
- XV. (vi) to any insurer under a policy of insurance effected under Article 10.1 or
- XVI. (vii) to directors, employees and officers of such party having made them aware of the requirements of this Article,

and is necessary to enable such party to perform this Agreement or to protect or enforce its rights under this Agreement or to enable it to comply with any requirement referred to in paragraphs (iv) and (v) above or to carry on its ordinary business.

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*[Signature]*  
DIRECTOR



## 15 Liability and Indemnity

### 15.1 Indemnity by the Concessionaire

The Concessionaire shall bear responsibility for loss of or damage to property, death, or injury to person, all third party claims and all expenses relating thereto (including without limitation reasonable legal fees) suffered by, or liability for which is attributed to Grantor, in connection with the Project Facilities, resulting from any negligent act or omission of the Concessionaire and/or its Contractors, Direct Contractors or Specified Contractors ("Concessionaire Indemnified Loss") without recourse to Grantor. The Concessionaire shall hold Grantor, fully indemnified in respect thereof. The said indemnity shall not extend to any Concessionaire Indemnified Loss to the extent that it was caused by any act or omission of Grantor, the State Government or any other statutory entity or the State Government or their failure to take reasonable steps in mitigation thereof.

### 15.2 Indemnity by Grantor

Grantor shall be responsible for loss or damage resulting from any negligent act or omission of Grantor ("Grantor Indemnified Loss"), without recourse to Concessionaire or its Contractors. Grantor will hold the Concessionaire fully indemnified in respect thereof. The indemnity shall not extend to any Grantor Indemnified Loss to the extent that it was caused by any act or omission of the Concessionaire or its Contractors, the failure of the Concessionaire and/or its Contractors to take reasonable steps in mitigation thereof.

### 15.3 Notice of Proceedings

Each party shall promptly notify the other party of any claim or proceeding in respect of which, but for the provisions of Section 15.4, it is entitled to be indemnified under this Section 10. Such notice shall be given as soon as reasonably practicable after the relevant party becomes aware of such claim or proceeding.

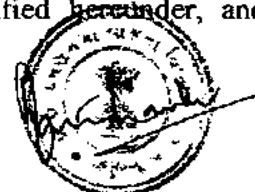
### 15.4 Basket Limitation

Neither party shall be entitled to receive any claim under this Section 15 until such time as all such claims by such party exceed the equivalent of Rupees Five Lakhs (5,00,000) in the aggregate, at which time all such claims of that party may be paid; Provided that, when such claims have been made, the same rule shall apply in respect of future claims. Notwithstanding the preceding sentence, either party shall be entitled to make any claim regardless of the amount, which claim if not made would be barred by the relevant statute of limitation.

### 15.5 Conduct of Proceedings

Each party shall have the right, but not the obligation, to contest, defend and litigate (and to retain legal advisers of its choice in connection therewith) any claim, action, suit or proceeding by any third party alleged or asserted against it, arising out of any matter in respect of which it is entitled to be indemnified hereunder, and the

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*[Signature]*  
DIRECTOR





reasonable costs and expenses thereof shall be subject to the said indemnity; Provided that, if the other party acknowledges in writing its obligation to indemnify the first-mentioned party in respect thereof to the full extent provided by this Section 15, such other party shall be entitled, at its option, to assume and control the defence of such claim, action, suit or proceeding at its expense and through legal advisers of its choice if it gives prompt notice of its intention to do so to the first-mentioned party and reimburses that party for the reasonable costs and expenses previously incurred by it prior to the assumption of such defence by the indemnifying party. Neither party shall settle or compromise any claim, action, suit or proceeding in respect of which it is entitled to be indemnified by the other party without the prior written consent of that party, which consent shall not be unreasonably withheld. Except where such consent is unreasonably withheld, if a party settles or compromises any claim, action, suit or proceeding in respect of which it would otherwise be entitled to be indemnified by the other party without the prior written consent of the other party, the other party shall be excused from any obligation to indemnify the party making such settlement or compromise in respect of such settlement or compromise.

#### 15.6 Double jeopardy

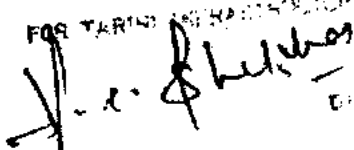
15.6.1 Grantor shall not cause any proceedings to be brought against the Concessionaire for any breach of its obligations under this Agreement without exhausting legal means as expressly provided in this Agreement.

15.6.2 The Concessionaire also shall not cause any proceedings to be brought against Grantor for any breach of its obligations under this Agreement without exhausting legal means as expressly provided in this Agreement.

15.6.3 The Concessionaire shall be entitled to an indemnity under this Section 15 only to the extent it has not received payment for the same loss, damage, death or injury under any other agreement relating to the Project. Grantor shall be entitled to an indemnity under this Section 15 only to the extent Grantor has not received payment under any other agreement in respect of the relevant acts or omissions.

#### 15.7 Consequential Losses

In no case shall the indemnities in Sections 15.1 and 15.2 extend to indirect or consequential loss or damage. Furthermore, subject to Section 21.9 neither party shall be responsible to the other party for indirect or consequential loss or damage resulting from the performance of obligations or the exercise of rights under or pursuant to this Agreement.

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 DIRECTOR



## 16 Assignment and Security

16.1 The Concessionaire shall not assign this agreement or transfer any of its assets unless otherwise allowed under this agreement and without the prior written consent of Grantor.

### 16.2 Creation of Security

Notwithstanding anything contained in the Section 16.1 above, for the purpose of financing the design, construction, completion, operation, maintenance of the Project, the Concessionaire may, create security over its rights and interests under or pursuant to (a) this Agreement (b) any agreement or other document comprising the Project Agreements (c) the fixed assets, of the Project (d) the movable property and intellectual property of Concessionaire, and (e) the revenues or any of the rights or assets of the Project.

## 17 Provisions Relating To Lenders, Investors and Concessionaire


### 17.1 Interests of Lenders and Investors

Grantor agrees that it will not take, and shall make best efforts to ensure that the State Government or other Statutory Entities will not take any Discriminatory Action that materially and adversely affects the interests of the Concessionaire or the Lenders under the Financing Agreement. If a non-discriminatory action of the State Government shall cause a material or adverse effect on such interests, Grantor may, at the request of the Concessionaire, use reasonable endeavors to assist the Concessionaire to mitigate such effect. If any such action of the State Government or other Statutory Entities shall cause a material and beneficial effect on such interests, the Concessionaire shall on its own accord, pass on such benefits to the Users or to Grantor through a mutually agreed method to be devised by the Independent Auditor.

The lenders will have right of substitution for the concessionaire in case of early termination of this agreement as per Section 12.5 (d).

### 17.2 Interests of the Concessionaire

Grantor shall make best efforts to submit to the State Government or other Statutory Entities that it does not take, any Discriminatory Action which materially and adversely affects the Project or the Project Facilities or the performance of the Concessionaire's obligations or enjoyment of rights under the Project Agreements or expropriate, or except as hereinafter provided, acquire the complex or the company, whether in whole or in part. If a Discriminatory Action of the State Government or a statutory entity shall cause any such material and adverse effect, Grantor may at the request of Concessionaire use its reasonable endeavors to assist the Concessionaire to mitigate such effect. If any action of the State Government shall cause a material and beneficial effect on the Project or the Project Facilities or the performance of the Concessionaire's obligations, Concessionaire shall on its own accord pass on a

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### 17.3 Restriction on Transfer of Shares of Concessionaire

17.3.1 The concessionaire must hold at least 51% of the equity of the project during the Concession period of the project or till the project is terminated under Section 12.

17.3.2 With respect to the transfer of registered ownership of any shares of Concessionaire, Concessionaire shall institute the procedures in this Section 17 and shall make appropriate provisions in its Articles of Association to ensure the compliance therewith in accordance with the provisions of this Section 17 and in accordance with the provisions of the Shareholders' Agreement to be entered into between Grantor and the Developer.

17.3.3 All transfer of shares of Concessionaire by either party during Concession Period shall require the consent of the other Party following procedures to be prescribed in the Shareholders' Agreement.

#### 17.4 Redemption or Repayment of Capital

Concessionaire shall not redeem or repay its share capital, in whole or in part, during the term of this Agreement except with the prior consent of Grantor in accordance with the provisions of this Agreement and the Shareholders Agreement, which consent shall not be unreasonably withheld or delayed. This Section shall not apply to redemption or repayment of share capital occurring by reason of the winding-up, liquidation or dissolution of Concessionaire.

17.5 The Concessionaire and other shareholders shall execute, deliver and where capable of registration register, such further instruments including the Shareholders' Agreements in order to perfect the grant of the right conferred under this Section 17.

**FOR TARIFF INFRASTRUCTURE LTD.**



## 18 Taxation

### 18.1 Taxation of the Concessionaire

The taxation of the Concessionaire (which shall include levy of any duty, cess, fee or tax in this regard including stamp duty) would be in accordance with the provisions of the applicable laws and regulations of the State and Central Government of India as amended from time to time. The Concessionaire shall not be entitled to any claim of compensation from Grantor for any adverse general change in the provisions of the tax laws made by the State or Central Governments after the coming in force of this Agreement.

### 18.2 Taxation of Lenders

There shall be no liability on Grantor for any change in tax laws affecting the Lenders and any such additional liability shall be borne by the Concessionaire.

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*[Signature]*  
DIRECTOR



## 19 Governing Law, Resolution of Disputes and Waiver of Immunity

### 19.1 Governing Law

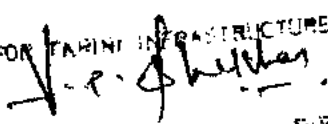
The rights and obligations of the parties under or pursuant to this Agreement shall be governed by and construed according to the laws of the Republic of India.

### 19.2 Amicable Settlement

In the event of any dispute, controversy or claim arises among the Parties in connection with this Agreement or the interpretation of any of its provisions upon the occurrence of an Event of Default, each Party shall appoint one senior representative who is not involved in the day-to-day operations relating to the Project and is readily available in the vicinity of Ahmedabad to serve on a consultation panel (the "Consultation Panel") and such Consultation Panel shall meet promptly upon the request of any member thereto or of any Party, in an effort to resolve such dispute, controversy, or claim. All such disputes shall be amicably settled through mutual consultation and negotiation between the representatives of the Consultation Panel. All reasonable costs incurred by the members of the Consultation Panel shall be borne equally by Grantor and the Concessionaire. The Parties hereby agree to use their best efforts to resolve all disputes under this Agreement through the Consultation Panel.

### 19.3 Mediation by Panel of Experts

- (a) In the event that the Parties are unable to resolve a dispute, controversy or claim in accordance with Section 19.2 above or upon occurrence of an Event of Default, then any Party may refer the dispute, controversy or claim to a Panel of Experts. Within fifteen (15) days of the issue of a notice of intention to refer the dispute to a Panel of Experts, the Concessionaire or Grantor shall either agree on the appointment of one person to act as expert, or failing agreement, appoint one expert each and such experts shall, within seven days of their appointment, designate a third person to act as expert in order to organise a Panel of Experts. The Consultation Panel may unanimously appoint a permanent Panel of Experts if so requested by the Parties.
- (b) The Party who initially issued the notice of intention to refer the matter to the Panel of Experts shall submit to the Panel of Experts and to the other Parties the following written documents: (i) a description of dispute; (ii) a statement of that Party's position; and (iii) copies of relevant documentary evidence on support of such position.
- (c) Within 10 days of receipt of the above documents, the other Party shall submit: (i) a description of dispute; (ii) a statement of that Party's position; and (iii) copies of relevant documentary evidence on support of such position.
- (d) The Panel of Experts may call for such further documentary evidence and/or interview such persons as they deem necessary in order to reach their decision.

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- (e) The Panel of Experts shall reach a majority decision and give notice to the Parties of their decision within 20 days of receipt of the documents provided by the Parties pursuant to subsections (b) and (c) above. The decision of the Panel of Experts shall be binding unless a Party issues a notice of intention to refer the matter to arbitration in accordance with Section 19.4 below.
- (f) The costs of engaging the Panel of Experts shall be borne equally by the Parties, and each Party shall bear its own costs of preparing the materials for and making presentations to the Panel of Experts. In the event the Parties are unable to resolve a dispute, controversy or claim pursuant to this Section within 45 days of the date when such dispute, controversy or claim first arose, then the provisions of Section 19.4 shall apply to such dispute, controversy or claim.

#### **19.4 Arbitration**

- (a) In the event that the Parties are unable to resolve any dispute, controversy, or claim in accordance with Sections 19.2 or 19.3, such dispute, controversy or claim shall be finally settled by a panel of arbitrators (the "Arbitration Panel") in accordance with the Indian Arbitration and Conciliation Act, 1996. The Arbitration Panel shall consist of three parties. The Concessionaire and Grantor shall appoint one arbitrator each and such arbitrators shall, within seven days of their appointment, designate a third person to act as an arbitrator in order to organise an Arbitration Panel. The arbitral proceedings shall take place in Ahmedabad. The Arbitration shall be conducted in English in accordance with the Rules of Indian Council of Arbitration. The arbitrators shall award speaking orders.
- (b) Any dispute, controversy or claim referred to the Arbitration Panel in accordance with Section 19.4 (a) above shall be considered a commercial dispute arising under the Indian Arbitration and Conciliation Act, 1996.
- (c) Any award by the Arbitration Panel shall be final and binding on the Parties.
- (d) The Parties shall bear their respective costs of Arbitration.

#### **19.5 Multi-party Dispute Resolution**

The Parties shall agree to join any dispute resolution proceeding under this Agreement with any other dispute resolution pending in respect of any other Project Contract relating to substantially the same matter.

#### **19.6 Performance during Dispute Resolution**

Pending submission of a dispute, controversy or claim to the Consultation Panel, the Panel of Experts or the Arbitration Panel the Parties shall continue to perform all of their obligations under this Agreement, without prejudice to a final adjustment in accordance with such decision.

#### **19.7 Sovereign Immunity**

Grantor hereby unconditionally and irrevocably:

FOR TARIK INFRASTRUCTURE LTD.

*[Signature]*

DIRECTOR



19.7.1 Agrees that the execution, delivery and performance by it of this Agreement and those agreements and other documents to which it is a party constitutes private and commercial acts rather than public or government acts and that it agrees to be bound by the provisions of the Gujarat Infrastructure Development Act, 1999;

19.7.2 Waives any right of immunity which it or any of its assets now has or may acquire in the future in any jurisdiction; and

19.7.3 Consents generally in respect of the enforcement of any judgment against it in any such proceedings in the courts of India.

#### **19.8 Enforcement**

The parties hereto agree to be subject to the laws in India with respect to this Project and hereby expressly and irrevocably waives any immunity in any jurisdiction in respect thereof.

**19.9 In case of any conflict with any other agreement, unless otherwise agreed between the Concessionaire and Grantor, this Agreement would take priority.**

FOR TARINI INFRASTRUCTURE LTD.

DIRECTOR



## 20 Accounts and Reports

### 20.1 Appointment of Statutory Auditors:

The Concessionaire shall make arrangements reasonably satisfactory to Grantor with respect to the installation and operation of an accounting and cost control system for Concessionaire and for the appointment as Statutory Auditors of a firm of independent chartered accountants reasonably acceptable to Grantor. On notice and for reasonable cause given to the Concessionaire, Grantor shall have the right, at its own expense, to have a firm of independent chartered accountants conduct additional audits of the Concessionaire by the Independent Auditor.

### 20.2 Right of Inspection:

The Concessionaire shall promptly furnish to Grantor such information as Grantor may from time to time reasonably request and permit representatives of Grantor on reasonable notice to visit the Project Facilities and any of the other premises where the business of the Concessionaire is conducted and to have access to its books of accounts and records in cases where Grantor has reasonable cause so to do.

### 20.3 Periodic Reports:

- (a) The Concessionaire shall, as soon as available but in any event within one hundred and eighty (180) days after the end of each financial year, furnish to Grantor: (i) two (2) copies of complete financial statement of Concessionaire for such financial year (which are in agreement with its books of accounts and prepared in accordance with accounting principles which are generally accepted in India and consistently applied), together with an audited report thereon, all in accordance with the requirements of the Companies Act, 1956; (ii) a copy of any management letter or other communication sent by the auditors to Concessionaire or to its management in relation to the Concessionaire's financial, accounting and other systems, management and accounts; (iii) a report by the auditors certifying that, based on its said financial statements, Concessionaire was in compliance with its financial obligations under the Financing Agreements as of the end of the relevant financial year or, as the case may be, detailing any non-compliance; and the Concessionaire shall authorise its auditors (whose fees and expenses shall be for the account of the Concessionaire) to communicate directly with Grantor at any time regarding Concessionaire's accounts and operations and shall furnish to Grantor a copy of such authorisation.
- (b) The Concessionaire shall, as soon as available but in any event within sixty (60) days of the end of each six (6) month period of each financial year, furnish to Grantor: (i) two (2) copies of Concessionaire's complete financial statements for such six (6) month period, all in accordance with the generally accepted accounting principles in India consistently applied, and, if requested by Grantor,

FOR NATHAN PAPERWORK LTD.

*[Signature]*

DIRECTOR





certified by an officer of the Concessionaire; (ii) a report on any factors materially and adversely affecting or which might materially and adversely affect the Concessionaire's business and operations or its financial condition; and (iii) (during construction of the Project) a report on the implementation and progress of the Project, containing such information as Grantor may reasonably require and disclosing any factors of which the Concessionaire is aware materially and adversely affecting, or which would be likely materially and adversely to affect, the carrying out of the Project.

#### 20.4 Reporting of Changes

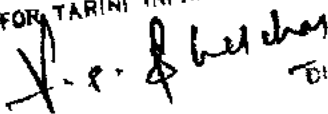
The Concessionaire shall, within thirty (30) days of its becoming effective, report any (i) change in Concessionaire's Memorandum and Articles of Association; (ii) change in Concessionaire's financial year; (iii) change in the constitution of its Board of Directors; (iv) change in the appointment of its Chief Executive Officer, Chief Financial Officer or Secretary; and (v) the registration of a transfer of shares to any person who thereby becomes a registered holder of more than five (5) per cent. of the issued share capital of Concessionaire or of a transfer of shares to or from a person who, immediately prior to such transfer, held more than five (5) per cent of the issued share capital of Concessionaire.

#### 20.5 Providing of Lists of Lenders and Creditors:

Within ninety (90) days of the end of each financial year, the Concessionaire shall provide to Grantor a list of each of Concessionaire's lenders and creditors to which Concessionaire owes a sum in excess of the equivalent of Rupees Ten Lakhs (10,00,000) including the details as to the amounts due to each of them. This list shall also indicate any changes, as compared to the list submitted in the previous year that have occurred.

#### 20.6 Information regarding Statutory Notice/Winding-up Proceedings:

- (a) The Concessionaire shall, within seven (7) days of receipt thereof, provide to Grantor a copy of any notice that the Concessionaire may have been served under the Companies Act, 1956 by any of the Lenders or its creditors.
- (b) The Concessionaire shall provide to Grantor all information in respect of any further actions taken by the Lenders or creditors following the said notices under the Companies Act, 1956.

FOR TARIINI INFRASTRUCTURE  
  
 DIRECTOR



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20.7 Notices of Default:

- (a) The Concessionaire shall, within seven (7) days of receipt thereof, provide to Grantor a copy of any notice of breach, default or other failure to perform received by the Concessionaire from any other party to any agreement or other document comprising the Security Package and a statement in reasonable detail of the grounds for such notice.
- (b) The Concessionaire shall provide to Grantor all information in respect of any further actions taken by the parties to such agreement or document following the said notices.

TARINI INFRASTRUCTURE LTD.

*J. C. Fletcher*

DIRECTOR



## 21 Miscellaneous Provisions

### 21.1 Notices

#### 21.1.1 Address of Notices

Any notice, request or other communication to be given or made under this Agreement shall be in writing and shall be delivered by courier, facsimile or registered mail. The address for service of each party and its facsimile number is set out opposite its name and the address set out below:

For the Concessionaire

For Grantor

#### 21.1.2 Effectiveness of Service

All notices shall be effective upon actual receipt thereof.

#### 21.1.3 Consents and Approvals

Any consent or approval of Government or any Relevant Authority referred to in this Agreement shall be deemed duly given if signed:-

- (a) in the case of a Specified Consent listed in Schedule 1, by an authorised official in the department identified as the Relevant Authority for that Specified Consent in Schedule 1; or
- (b) in the case of any other consent or approval, by the official, as the Chief Executive Officer/Managing Director/Chairman may notify the Concessionaire as being the responsible official for the relevant consent or approval;

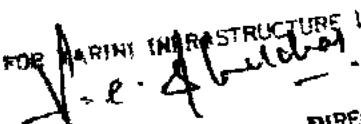
Provided that Grantor or the relevant Authority may, by notice given in accordance with Section 21.1.1, designate a different official or department for the purposes of giving any consent or approval referred to in paragraph (a) or (b) above and not yet given.

### 21.2 Variations in Writing

All additions, amendments and variations to this Agreement shall be binding only if in writing and signed by duly authorised representatives of the parties.

### 21.3 Entire Agreement

This Agreement, including the Schedules, the finally agreed Technical Bid, RFP,

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 DIRECTOR



shareholder's agreement, the DPR, LOI and any such agreements represents the entire understanding between the parties in relation to the subject matter hereof and supersedes any or all previous agreements or arrangements between the parties in respect of the Project (whether oral or written).

#### 21.4 Waivers

21.4.1 No waiver by either party of any default by the other in the performance of any of the provisions of this Agreement:

(a) Shall operate or be construed as a waiver of any other or further default whether of a like or different character; or

(b) Shall be effective unless in writing duly executed by an authorised representative of such party.

21.4.2 The failure by either party to insist on any occasion upon the performance of the terms, conditions and provisions of this Agreement or time or other indulgence granted by one party to the other shall not thereby act as a waiver of such breach or acceptance of any variation.

#### 21.5 Termination

This Agreement shall not be terminated except in the circumstances expressly set out in this Agreement.

#### 21.6 Successors and Assigns:

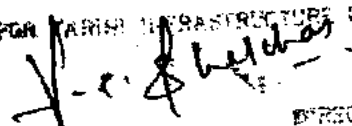
This Agreement shall inure to the benefit of, and be binding upon, the successors and permitted assigns of the parties.

#### 21.7 No Liability for Review:

No review or approval by Grantor of any agreement, document, instrument, drawing, specifications or design proposed by the Concessionaire shall relieve the Concessionaire from any liability that it would otherwise have had for its negligence in the preparation of such agreement, document, instrument, drawing, specification or design or failure to comply with the applicable laws of the State of Gujarat or the Central Government with respect thereto, nor shall Grantor be liable to the Concessionaire or any other person by reason of its review or approval of an agreement, document, instrument, drawing, specification, or design.

#### 21.8 Third Party Beneficiaries:

21.8.1 Subject to Section 21.8.2, this Agreement shall not confer any right of suit or action whatsoever on any third party.

FOR KARNI INFRASTRUCTURE LTD.  
  
 DIRECTOR



21.8.2 Notwithstanding the provisions of Section 21.8.1, the Concessionaire, both for obligations of Grantor referred to in Section 21.8.3 and to recover, for and on their behalf, any losses, damages or other amounts to which the Developer and Affiliates would have been entitled had they been parties to this Agreement; Provided, that in ascertaining the amount of any loss incurred by any of the aforementioned parties there shall be taken into account any amount payable by Grantor or any statutory entity to the Concessionaire for its own account in respect of that loss.

21.8.3 Section 21.8.2 shall only apply to (a) the obligations of Grantor in respect of the Investors under Sections 4.1.7 (b) any interference by Grantor in the payment by the Concessionaire to the Developer and Other Consortium Members of amount to which they are entitled under the Concessionaire's Memorandum and Articles of Association or any instrument constituting convertible securities of the Concessionaire on the due date for payment there under. The enforcement by the Concessionaire pursuant to Section 21.8.2 on behalf of the above parties shall not be regarded as the enforcement of a claim for indirect or consequential loss or damage for the purposes of Section 15.7.

#### 21.9 Affirmation:

The Concessionaire declares and affirms that it and (so far as the Concessionaire is aware) the Developer and the Other Consortium Members and the Concessionaire's directors and employees have not paid nor undertaken to pay any bribe, pay-off or kick-back or unlawful commission and that it has not in any other way or manner which is unlawful paid any sums, whether in Rupees or Foreign Currency and whether in India or abroad, or in any other manner given or offered to give any gifts and presents in India or abroad, to any person or company to procure this Agreement or any other agreement or other document comprising the Project Agreements. The Concessionaire undertakes and shall cause the Users and other Consortium Members to undertake not to engage in any of the said or similar acts during the term of this Agreement.

#### 21.10 Security Protection

The Concessionaire shall provide such security personnel, as it deems appropriate for the protection and security of the Project. Cost of such security personnel during the construction phase shall be part of the Project Cost and thereafter part of the Operations & Maintenance Cost.

FOR TARIHI INFRASTRUCTURE LTD.

*A. e. Fletcher*  
DIRECTOR



### 21.11 Conversion

Conversion of foreign currency shall be as per provisions of the Foreign Exchange Management Act, 1999.

### 21.12 Payments by either party:

Subject to Section 13, all sums payable by either party under this Agreement shall be paid (except to the extent required by applicable law or as expressly permitted under this Agreement) (a) free of any restrictions or conditions, and (b) without deduction or withholding on account of set-off or counter-claim. Also all the payments to be made by either party must be made within 30 days from the due date of such payment or after receiving any such request by other party or as provided under any this Agreement. If the payments are not made within the stipulated time, the party, making the payment, shall pay an interest of Prime Lending Rate + 5% per annum.

### 21.13 Partial Invalidity:

The illegality, invalidity or un-enforceability of any provision of this Agreement in whole or in part under the law of any jurisdiction shall not affect its legality, validity or enforceability under the law of any other jurisdiction, nor shall it affect the legality of any other provision or part hereof.

### 21.14 Relationship

*None of the provisions of this Agreement shall be deemed to constitute a partnership between the parties hereto and no Party shall have any authority to bind the other Party otherwise than under this Agreement or shall be deemed to be the agent of the other in any way.*

### 21.15 Cumulative Rights

All remedies of either Party under this Agreement whether provided herein or conferred by statute, civil law, common law, custom, trade, or usage are cumulative and not alternative and may be enforced successively or concurrently.

### 21.16 Cost and Expenses

Unless otherwise mentioned costs incurred by each party shall be borne by respective party.

FOR TARPINI INFRASTRUCTURE LTD.

*V. R. G. G. G. G.*  
DIRECTOR



IN WITNESS where of, the parties have entered into this Agreement the date first above written.

1. For and on behalf of Grantor

By:

Name: Ravi Shankar Pujari

Designation: Executive Engineer

Damanganga Project Division, Madhuban  
Madhuban Colony.



EXECUTIVE ENGINEER

DAMANGANGA PROJECT DN. No. 1

MADHUBAN COLONY.

2. For and on behalf of the Concessionaire

By:

Name: V. Chandrashekhar.

Designation: Director

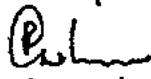
Tarini Infrastructure Ltd.  
New Delhi.

FOR TARINI INFRASTRUCTURE LTD.

DIRECTOR

Witnesses:

1. G. D. Joshi  
S/o K. D. Joshi  
2-1 Saket Housing Soc  
Malcahpura Road Baroda

2.   
(R.G. Dhruv)  
P.S. & DSE

000219

**Schedule 1 : Specified Consents**

(The comprehensive list is enclosed in Annexure I , as applicable to the project.)

**Schedule 2 – Specification and Standards.**

The specifications to build the Project shall be as specified in the RFP document of particular project, to be finalised in DPR, as this will differ from project to project.

However, some standard specifications may be prepared by Grantor, which can be applied across all the projects.

**Schedule 3 – Project completion and Construction Schedule**

Sr. No.	Milestone Activity	Time Schedule

The time schedule for each activity may be indicated by the bidder in the RFP bid and which should be finalised in DPR to be prepared by the developer.

**Schedule 4 – Lease Rental Schedule**

Land Lease Rates will be as under:

Land earmarked for the project.	As per project requirement
i) Premium (Up-front)	Rs. 0 per hectare.
ii) Lease Rent (Payable per annum)	Rs. 32,400 per hectare

Rate of lease rents shall be revised as per Government policy from time to time. Separate agreement shall be executed after finalization of land area required for project.

**Schedule 5 – Project Site map as per RFP and DPR for land area usage Plan****Schedule 6 – Computation of Termination amount  
(As per Annexure II attached.)**

FOR TARIK INFRASTRUCTURE LTD.

DIRECTOR





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Hydro Power Damanganga

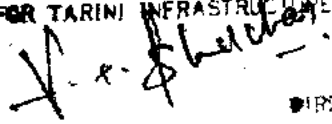
Concession Agreement

**ANNEXURE I****List of clearances required:**

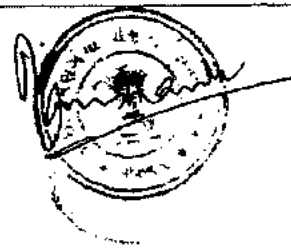
Sr.No	Relevant Consent, Clearance or Approval	Authority of Concern
1	Clearance by SEB / State Govt. to the scheme pursuant to Section 18-A of the Electricity ( Supply ) Act. 1948	SEB / State Govt.
2	TEC by the CEA to the scheme ( for MoU based projects above 100 crores and for competitive bidding base projects above 1000 crores )	CEA
3	Comprehensive clearance of the Ministry of Environment and Forests following consideration of the Environment Impact Assessment Management Plan pursuant to Section 3(1) and 3(2)(V) of the Environment ( Protection ) Act, 1986 and Rule 5(3)(a) of the Enforcement ( Protection ) Rules, 1986, such approval to cover the Project and the Sites.	Ministry of Environment and Forests.
4	Approval from the Central Pollution Control Board / State Pollution Control Board pursuant to Section 25 of the Water ( Prevention and Control of Pollution ) Act 1974 in connection with the discharge of water from the Site.	Central Pollution Control Board / State Pollution Control Board.
5	Confirmation from the State Govt. Forest Department that the Site contains no forest and / or land deemed to be " reserved forest." Land for the purposes of the Forest ( Conservation ) Act, 1980.	State Govt. Forest Department.
6	Consent of the Irrigation Department pursuant to the State Irrigation Act, 1976 to the establishing of water storage or water management facilities, any barrage, any reservoir or any other water facilities including pumping stations, and any way leaves and licenses for the laying of pipe lines ( including the temporary water pipe lines from any barrage to the Power Station ).	Central Water Commission / State Govt. Department of Irrigation.
7	All consents required for the insuring of the whole or any part of the Project with insurers and / or reinsurers located out side India, such consents to include.	General Insurance Corporation / GOI ( Controller of Insurance ) GOI Ministry of Finance / Reserve Bank of India.
8	Permission from the Director General of Foreign Trade for the various imports pursuant to the Foreign Trade ( Development and Regulation ) Act, 1992	Directorate General Technical Development / Director General of Foreign Trade.
9	Exemption under Section 9(1)(a) of the Stamp Act, 1958 in respect of stamp duty payable on the amounts secured by the Security Package in favour of the Lenders and SEB and / or relating to the Financing Agreements.	State Govt. Department of Finance / Department of Revenue.
10	Exemption from the application of any tax, duty levy or cess and in particular, octroi and water tax levied by any State Govt. Agency.	State Govt. Department of Finance.

Page 72 of 74

FOR TARINI INFRASTRUCTURE CO.,



DIRECTOR



11	Consent of the Director General of Civil Aviation to use and operate an airstrip and helicopter landing pad, and to use and operate a helicopter and / or other aircraft, pursuant to the Aircraft Act, 1934.	Director General of Civil Aviation.
12	Permission from the Directorate General of Technical Development / Director General of Foreign Trade to import helicopters, aircraft or other such vessels under the Foreign Trade ( Development and Regulation ) Act, 1992	Directorate General of Technical Development / Director General of Foreign Trade.
13	Approval of the Sites Agreement and consent to the creation of security over the Sites Agreement in favour of the Lender's Representative, the Lenders or any agent, representative or trustee acting on its or their behalf and SEB.	State Industrial Development Corporation.
14	Approval from the local authorities within whose territorial jurisdiction the Power Station is to be located for the civil construction of the Power Station, the building plans relating thereto, compliance with any zoning or planning laws and any certificates of completion.	State Govt. District Town Planning Officer / State Industrial Development Corporation.
15	Confirmation from the Government of State of non-applicability of electricity duty under Section 3 of the Bombay Electricity Duty Act, 1958	State Govt. Department of Energy.
16	Consent of the Telegraph Authority pursuant to Section 4 of the Indian Telegraph Act 1885 and Part V of the Indian Telegraph Rules, 1951 for the provision of telecommunications and satellite facilities	Department of Telecommunications.
17	Confirmation from the Government of State as to the non-applicability of tax on the bulk sales of electricity by bulk licensees under Section 3 of the State tax on Sale of Electricity Act, 1963	State Govt. Department of Energy.
18	License from the State Govt. Labour Commissioner for construction Labour pursuant to Section 7 of the Contract Labour ( Regulation and Abolition ) Act, 1970 before start of construction.	State Govt. Labour Commissioner.
19	Registration of workers required pursuant to Section 2A of the Employees State Insurance Act, 1948 before construction, or exemption to be claimed if other group insurance is taken.	State Govt. Labour Commissioner
20	Consent under the Factories Act, 1948 relating to fire fighting capability.	State Govt. Chief Inspector of Factories.
21	Approval from the Foreign Investment Promotion Board that the Financing Agreements may be entered into without necessarily selecting Indian governing law in cases where the Lender is a non Indian resident.	GOI Foreign Investment Promotion Board.

Note : Applicable consents listed above shall be availed by the Concessionaire:

FOR TAPINI INFRASTRUCTURE LTD.  
  
 DIRECTOR



**Annexure II****1.0 Termination Payment.**

1.1 Upon Termination on account of Concessionaire Default during the Operation Period the Authority shall pay to the Concessionaire, by way of Termination Payment, an amount equal to 90% ( ninety percent ) of the Debt Due less Insurance Cover, provided that if any insurance claim forming part of the Insurance Cover are not admitted and paid, then 80% ( eighty percent ) of such unpaid claims shall be included in the computation of Debt Due. For the avoidance of doubt, the Concessionaire hereby acknowledges that no Termination Payment shall be due or payable on account of a Concessionaire Default occurring prior to the Project Completion Date.

1.2 Upon Termination on account of an Authority Default, the Authority shall pay to the Concessionaire, by way of Termination Payment, an amount equal to :

- ( a ) Debt Due, and
- ( b ) 150% ( one hundred and fifty percent ) of the Adjusted Equity.

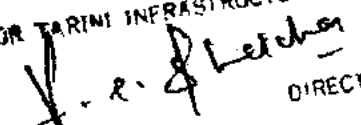
Where as Adjusted Equity means the Equity Funded in Indian Rupees and adjusted on the first day of the current month ( the "Reference Date." ), in the manner set forth below, to reflect the change in its value on account of depreciation and variations in WPI, and for any Reference Date occurring :

On or before the Project Completion Date, the Adjusted Equity shall be sum equal to the Equity funded in Indian Rupees and expended on the Project, revised to the extent of one half of the variation in WPI occurring between the first day of the month of Appointed Date and the Reference Date ;

Whereas " Appointed Date." Means the date on which Financial Close is achieved or an earlier date that the Parties may by mutual consent determine, and shall be deemed to be the date of commencement of the Concession Period :

Whereas, " Reference Date.." means date immediately preceding the Transfer Date.

1.3 Termination Payment shall become due and payable to the Concessionaire within 15 ( fifteen ) days of a demand being made by the Concessionaire to the Authority with the necessary particulars, and in the event of any delay, the Authority shall pay interest at a rate equal to 3% ( three percent ) above the Bank Rate on the amount of Termination Payment remaining unpaid, provided that such delay shall not exceed 90 ( ninety ) days. For the avoidance of doubt, it is expressly agreed that Termination Payment shall constitute full discharge by the Authority of its payment obligation in respect thereof hereunder.

FOR TARINI INFRASTRUCTURE LTD.  
  
 DIRECTOR



## SHAREHOLDERS AGREEMENT

### 1. PARTIES

1.1 The parties to this agreement are:

1.1.1 NARMADA WATER RESOURCES, WATER SUPPLY AND KALPSAR DEPT (hereinafter referred to as "Grantor")

1.1.2 TARINI INFRASTRUCTURE LTD, a company incorporated in Delhi having its registered office at \_\_\_\_\_ (hereinafter referred to as "Concessionaire")

1.2 The parties hereby agree to the terms and conditions set out in this Agreement.

### 2. PREAMBLE AND BACKGROUND

2.1 The Government of Gujarat after detailed evaluation of bids and proposals received by it selected M/s Tarini Infrastructure Ltd ( The Concessionaire ) for implementation of the Small Hydro Power Stations on Daman Ganga (Madhuban) Dam.

2.2 The Concession Agreement inter alia requires that the Concessionaire and its affiliates shall hold a minimum stake of 51% in the Project during implementation and the Concession period of 35 years. It is envisaged that specific Shareholders' Agreement be drawn up between the Concessionaire and the Grantor to this effect.

### 3. SHAREHOLDING

3.1 It is agreed that the concessionaire and its affiliates would acquire and hold stake in the Project of not less than 51% during implementation of the Project and operation of the concession.

3.2 In case the Concessionaire wishes to share the ownership of the Project the same shall be done bearing in mind the condition set forth in 3.1

FOR TARINI INFRASTRUCTURE LTD.

*[Signature]*  
DIRECTOR



above and it shall do so under intimation to the Grantor seeking the Grantor's consent for the same.

- 3.3 This Agreement shall be binding on the Concessionaire during the Concession period and it shall cease to apply on termination of concession by efflux of time or otherwise.

#### 4. TERMINATION OF CONCESSION BY GRANTOR

- 4.1 As provided in Clause 12.3 the concession can be terminated by the Grantor if the Concessionaire and its affiliates fail to own 51% of the equity in the Project at any time during the period of concession.
- 4.2 Any changes occurring on account of any compromise or amalgamation or arrangement or reconstruction, not affecting the ability of the Concessionaire to perform obligations cast by the concession agreement, shall be out of the purview of this Agreement provided that the compromise, arrangement, amalgamation or reconstruction have been approved by the Grantor. ( Clause 12.3 (k) of the Concession Agreement ).

#### 5. BREACH

- 5.1 Should any party ("the defaulting party") commit a breach of any of the provisions hereof, then the other party ("the aggrieved party") shall be entitled to give the defaulting party 14 (fourteen) days written notice to remedy the breach.
- 5.2 Provided always that, notwithstanding anything to the contrary contained in this agreement, the aggrieved party shall not be entitled to cancel this agreement for any breach by the defaulting party unless such breach is a material breach going to the root of this agreement and is incapable of being remedied.

FOR TATINI INFRASTRUCTURE LTD.

*[Signature]*  
DIRECTOR



6. **ARBITRATION**

Should any dispute or difference ("dispute") arise between the parties under or out of this Agreement (including its implementation, interpretation or rectification) or out of its termination or cancellation, then the parties shall meet within 7 (seven) days of the arising of the dispute to settle the dispute. If they do not settle the dispute, any party to the dispute shall be entitled to cause the dispute to be submitted to and decided by arbitration.

IN WITNESS Whereof the parties have entered into this agreement on this the 27 day of AUGUST 2007

1. For and on behalf of Grantor

By. *Ravi Shankar Pujari*Name. RAVI SHANKAR PUJARIDesignation. EXECUTIVE ENGINEER  
DAMANGANGI PROJECT DN. No. 1  
MADHUBAN COLONY.

2. For and on behalf of the Concessionaire

By. *V. Chandrashekhar*Name. V. CHANDRASHEKHARDesignation. Director

FOR TARIKI INFRASTRUCTURE LTI  
*V. Chandrashekhar*  
DIRECTOR

Witnesses:

*[Signature]*  
1. *Ch. G. Dhiman*  
*P33 PAF*

*[Signature]*  
2. *G. D. Joshi*

*c - 1 Saket Housing Soc*  
*Nalcarpura Road*  
*Bandra - 40010*

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FOR TARINI INFRASTRUCTURE LTD.

DIRECTOR



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- 5.2 Provided always that, notwithstanding anything to the contrary contained in this agreement, the aggrieved party shall not be entitled to cancel this agreement for any breach by the defaulting party unless such breach is a material breach going to the root of this agreement and is incapable of being remedied.

FOR TRINITY INFRASTRUCTURE LTD.

*[Signature]*  
DIRECTOR





## 6. ARBITRATION

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IN WITNESS Whereof the parties have entered into this agreement on this the 27 day of AUGUST 2007

### 1. For and on behalf of Grantor

By. *Ravi Shankar Pujari*Name. RAVI SHANKAR PUJARIDesignation. EXECUTIVE ENGINEER  
DAMANGANG PROJECT DN. No. 1  
MADHUBAN COLONY.

### 2. For and on behalf of the Concessionaire

By. *V. Chandrasekhar*Name. V. CHANDRASEKHARDesignation. Director

FOR TARIKI INFRASTRUCTURE LT  
*V. Chandrasekhar*  
DIRECT

Witnesses:

1. *Ch. G. Dhiman*  
PSE DFE

2. *G. D. Joshi*

c - 1 Saket Housing Soc.  
Malakpura Road  
Bandra - 40010

000229



# TARINI INFRASTRUCTURE LTD.

D-2, First Floor, Amar Colony, Lajpat Nagar-IV, New Delhi-110024  
Tel. No. : +91 11 26479995 Fax No. : +91 11 26477996  
E-mail : tarini@nde.vsnl.net.in

Monday, August 27, 2007

To  
Executive Engineer  
Daman Ganga project Division no:1  
Madhuban colony  
Gujrat

Sub: Concession Agreement for setting up of Small hydro power station on Damanganga Dam

Ref: Govt Letter No Dmn/ 2005 / MOU /1170/(40 j DATED 01.08.2007

Sirs

This is reference to the above we hereby Give Consent to Sign the concession agreement. We shall be subject to modifications/additions/corrections after due approval by Govt of Gujrat .

The said modifications or alterations shall form a part of the concession agreement shall be accepted by us after due diligence.

Sincerely Yours

-sd-

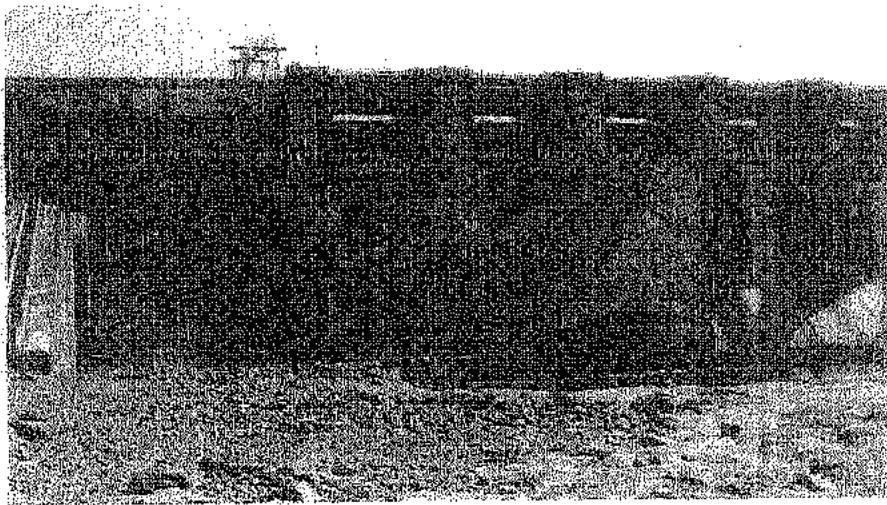
(V.CHANDRASHEKHAR)  
Director

ANNEXURE-P SCCd/y)

• 000230

GOVERNMENT OF GUJARAT  
(IRRIGATION DEPARTMENT)

DAMAN GANGA DAM TOE S.H.P-1  
(3MW)



M/s TARINI INFRASTRUCTURE LIMITED  
NEW DELHI

DETAILED PROJECT REPORT

JULY, 2007

CONSULTANTS  
TARINI INTERNATIONAL PVT. LTD.  
D-2, FIRST FLOOR, AMAR COLONY, LAJPAT NAGAR - IV,  
NEW DELHI - 110024

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6.	Transmission Line	-	TIL / DAMAN-C / DPR / 002

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## Check List

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## CHECK LIST

NAME OF THE PROJECT : DAMANGANGA DAM TOE  
SHP-1

### LOCATION

(A) State : Gujarat  
(B) District : VALSAD

CATEGORY OF THE PROJECT : MINI HYDEL PROJECT

### PLANNING:

Have the alternative proposal been studied and their merits and demerits discussed? : NA

Have the detailed topographical surveys been carried out for the following items and drawings prepared as per prescribed scales?

- (a) Stream surveys : NA
- (b) Head work surveys (weir or diversion structure). : Yes
- (c) Water Conductor system : Yes
- (d) Power House, Switchyard, Tailrace : Yes
- (e) Penstock : Yes

### GEOLOGY:

Have the geological surveys for head works. Power house and tail race etc. been carried out and report on general geology of the area and on geology of the sites of principal structures appended? : NA

# **HYDROLOGICAL & METEOROLOGICAL INVESTIGATIONS:**

Have the hydrological and meteorological investigations been carried out and status of data discussed in report.

- |      |  |   |     |
|------|--|---|-----|
| (i)  | Rainfall in the catchment              | : | Yes |
| (ii) | Gauge and discharge data of the stream | : | Yes |

## **HYDROLOGY**

Have hydrological studies been carried out to established the availability of water for the benefits envisaged and what is the dependability of the potential ?	:	Yes 75%
---	---	------------

## **LAND ACQUISITION & RE-SETTLEMENT (wherever applicable):**

- |  |   |                            |
|--|---|----------------------------|
| Have the provisions for land acquisition been considered ?                                   | : | NA                         |
| Have the socio-economic problems involved in re-settlement been investigated and discussed ? | : | Re-settlement not involved |

## **DESIGN:**

Has the layout of the project components viz. diversion structures. Water conductor system. Power house and tail race been finalized ?	:	Yes, Project layout of Water Conductor System and Power House structure finalized
--	---	---

Have the preliminary designs been prepared for the following components ?

- |    |   |   |     |
|----|---|---|-----|
| a. | Diversion weir  | : | NA  |
| b. | Penstock and water conductor system   | : | Yes |
| c. | Power house and switchyard  | : | Yes |
| d. | Power house equipment. LT switching equipment and control & protection equipment. | : | Yes |



000236

- e. Steel of various sizes and type of reinforcement : Yes
- f. Other materials-P.O.L. Electricity Explosives etc. : Yes

**ESTIMATE :**

- a. Is the estimate prepared ? : Yes
- b. Have the analysis of rates for various major items and the components of the project been furnished with basis of analysis & the price index at which the estimate is based. : Yes.

**ECOLOGICAL & ENVIRONMENTAL ASPECTS :**

- Is the area likely to have any environmental and ecological problems due to the alternate surface water pattern and preventive/corrective measures discussed ? (wherever applicable). : No environmental and ecological degradation

**CAMPS AND BUILDINGS :**

- Has the provision for camps building made ? : Yes

**SOIL CONSERVATION:**

- Is the need for soil conservation Measures in the project discussed? : Not applicable

• 000237

## Salient Features

**SALIENT FEATURES****DAMAN GANGA DAM****1. Location**

i)	Name of Scheme	:	Damanganga Dam Toe Small Hydro Project
ii)	State	:	Gujarat
iii)	District	:	Valsad
iv)	River	:	Damanganga
v)	Roil Head	:	Vapi 30 Km from Dam site
vi)	Nearest Air port	:	Mumbai 180 Km from Dam site
vii)	Geographical Coordinates	:	
	Latitude	:	20° 10' N
	Logitude	:	73° 5' E

**2. Discharge**

a)	Daily incoming flow in cumec :	80.40
b)	Daily overflow in cumec :	69.182
c)	Daily discharge used for irrigation in cumec :	8.31

**3. HYDROLOGY**

a)	CA (sq.Km.)	:	
	Maharashtra	:	1318
	Gujarat	:	376
	Union territories	:	119
	Total	:	1813
b)	Average rainfall (mm)	:	2232.17
c)	Maximum Rainfall	:	3379.3
d)	75% dependable runoff from entire catchment (Mcum)	:	3150.4
e)	entire catchment from Gujarat and UT only (Mcum)	:	639.7
f)	Maximum flood discharge (cumec)	:	22040.00 (Routed)
g)	Full Reservoir Level	:	79.858 m
h)	MDDL	:	61.57 m
i)	Maximum TWL	:	56.928m
j)	Minimum TWL	:	44.95 m
k)	Average	:	50.939 m

**4. Water Levels for Power Generation**

Full Reservoir Level	:	79.858m
Normal T.W.L (for SHP-I)	:	42.5m
Normal T.W.L (for SHP-II)	:	61.00m

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## SALIENT FEATURES

### DAMAN GANGA SHP -1 (2 X1500KW)

1. Steel Penstock	:	
Dia	:	1.5m
No	:	2
Length of each	:	9.0m
2. Power House	:	
Length (m)	:	22.5m
Width (m)	:	10m
Height (m)	:	24
3. Design Discharge	:	13.55 cumec
4. Head (m)	:	
Maximum Net Head	:	33.75
Minimum Net Head	:	17.55
Rated Net Head	:	27
5. Installed Capacity -	:	2x 1500 KW
6. Energy Generation	:	
75% Dependable year	:	12.95 Mus
7. Plant Load Factor	:	51.86%
8. Type of Turbine	:	Vertical Kaplan
9. Generator	:	
Type	:	2Nos. Vertical Shaft synchronous machines
Rated Capacity	:	1765 KVA
No of Phases	:	3
Frequency	:	50 Hz
Power Factor	:	0.85
Rated Terminal Voltage	:	3.3 KV
Speed (rpm)	:	600

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10. Generator Step-up transformer

i) Location	:	Outdoor
ii) Nos.	:	2
iii) Rated Voltage	:	3.3/33Kv
iv) Frequency	:	50Hz
v) Type of cooling	:	ONAN

11. Transmission Line (33KV) : Existing GEB's Substation 66KV at Rakholi  
-4 Km from Power House site

12. Estimated Cost (July 2007 Level)

i) Civil Works	:	Rs. 301 Lakhs
ii) E&M Works	:	Rs. 1391 Lakhs
iii) Transmission Works	:	Rs. 40.00 lakhs
iv) Total Project Cost	:	Rs. 1692 Lakhs
v) Cost per MW installed	:	Rs. 564 Lakhs

13. Cost of Generation per Kwh

First Year (With ROE ) : Rs. 2.69

14. Levelised Tariff (35 Years) : Rs. 2.18

15. Sale Rate (Rs. per Kwh) : Rs. 2.90

16. Internal Rate of return (IRR) : 17.36%

17. DSCR

Average : 1.54

Minimum : 1.10

Maximum : 1.98

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## CHAPTER 1

### Introduction

## CHAPTER-1

## INTRODUCTION

## 1.0 Introduction

Gujarat Irrigation Department has proposed Daman Ganga Dam Toe Small Hydro Power Project at Daman Ganga Dam/Madhuban reservoir located 30 Km away from Vapi in Valsad District, in Gujarat State. M/s Tarini Infrastructure Limited (TIL), New Delhi intends to take up one Small Hydro Project namely SHP -1 on existing concrete outlet for development under private sector participation on Built-own-operate basis. 3 MW installation is proposed for SHP-1.

M/s Tarini Infrastructure Ltd. Limited is applying to the relevant department under Government of Gujarat for taking up this proposed Small Hydro Power Project for implementation.

Accordingly, Detailed Project Report has been prepared by TIL for submission to Irrigation Department for taking up Small Hydro Power Project of 3.0 MW installed capacity.

## 1.1 Project Description

Daman Ganga Dam is a major irrigation Project across river Damanganga in Gujarat State. The Damanganga Dam project is a masonry cum earthen dam. The total length of the Dam is 2728 m excluding spillway length of about 191 m. This project is irrigation cum Power Project and about 3.00 MW Hydro Power generation is proposed by Tarini Infrastructure Ltd.

## 1.2 Components of Dam Toe SHP-1

The main components of the SHP -1 is as given below:-

## 1.2.1 Intake

Two openings have already been provided at chainage 1013.469 m & 1018.955 m respectively in the body of the dam on the right bank. Trashracks, stoplogs & gates have been provided at the upstream face of the dam in each opening.

## 1.2.2 R.C.C Conduit /Penstock

Two number RCC penstocks each of size 1.524 x 1.524 m (square opening) and length of about 33m from intake opening to Bulk head have already been provided in the body of the masonry dam on the right bank. Steel lined penstock each of dia 1.5m, 12 mm thick and 9.5m long is proposed to be provided starting from existing end of bulk head, which will be further reduced to 1.2m dia near the upstream of the power house to feed two generating units.

### 1.2.3 Power House & Switchyard

Power House building is a simple structure housing two generating units, auxiliary equipment & control panels. The Power House is proposed on the right bank on the downstream side of existing dam. The average ground level in the vicinity of the Power House building is 42m. The main feature of the Power House building are as follows.

- (i) The main building of size 22.5m x 10m in plan is provided to accommodate two generating units each of 1500 KW including auxiliary equipment etc.
- (ii) The total height of the building is about 24m from deepest foundation level which is same as that of existing side walls of stone masonry. Due to high floods from river side RCC wall is proposed on the downstream side up to EL 61.26m so that water may not enter inside the Power House. Power House building will be compact one and it will be made water tight on all the four sides. To facilitate handling of equipment one No. EOT crane of 20 tonnes capacity is proposed to be provided i.e. inside the Power House. This will be used during erection & maintenance.

Approach to the Power House will be from top at EL 61.26m. One hatch cover of size 4m x 4m is to be provided for handling of equipment from top. A movable crane of capacity 20 tonnes is proposed to be provided at top of the Power House for erection and maintenance of generating units. Thus entry will be possible only from top of the Power House i.e. from existing generator room which is at EL. 60.96m.

- (iii) A separate control room of size 22.5m X 5m is proposed at EL 45.00 on the u/s of Power House where sufficient space is available between Power House & existing bulk head of R.C.C ducts.
- (iv) Walls of the building will be made of R.C.C.
- (v) Two vertical gates each of size 3.25m X 2m will be provided at the end of draft tube to facilitate dewatering of draft tube during maintenance and closure of generating units during maintenance.
- (vi) A raft foundation is provided considering the vibration of machines and uplift pressures.

### 1.2.4 Tail race channel

Discharges from the generating units will be fed into single tail race channel of 9.25 width. The length of tail race channel will be about 15.6m with 4:1 (H: V) slope. The exit end of draft tube will be at EL 38.35m & weir crest will be at EL 42.25m. The minimum tail water level at EL 42.5m will be maintained by construction of weir at the end. Tail race channel has been designed for a discharge of about 15 cumecs.

### 1.2.5 Switchyard

Switchyard is proposed to be provided near the existing generator room of the dam at EL 60.96m where sufficient space is available.



CHAPTER 2

Surveys and Investigations

## CHAPTER 2

### Surveys and Investigations

#### 2.1 General

Detailed topographical survey of SHP-1 area on the downstream side of existing Power outlets and transmission line has been carried out as detailed below:

#### 2.2 Topographical Surveys

Detailed topographical survey of SHP-1 area on the downstream side of existing Power outlets has been carried out on 1:500 scale with 0.25 m contour interval.

Detailed topographical surveys for the transmission line from proposed Power House to existing 66 KV Sub-station at Rakholi has been carried out on 1:7000 scale with contour interval of 0.25 m. The total length of transmission line will be about 4 Kms.

#### 2.3 Hydrological Surveys

The proposed Power House will generate power by utilizing the hydro power potential by utilizing the excess releases through existing power outlets already installed in the body of masonry dam Table showing ten daily reservoir operation from 1987 to 2003 is presented in Table 3-1.

#### 2.4 Geological Investigations

Rocky strata is available around the proposed location of the power house. It was seen that sound rock is available on surface itself.

#### 2.5 Construction material

Coarse aggregate required for use as the construction material will be available within a radius of about 30 km (Near Vapi) while fine aggregate will be available at a distance of about 125 km from the project site and transported from Unai Anaval.

#### 2.6 Power Evacuation

Daman Ganga Power project ( SHP-1) shall generate 3000 kW of power which shall be stepped up to 11/33 KV level at the switchyard of the generating station for further evacuation of the same to the nearest GEB's 66 KV substation at Rakholi (About 4 Kms from the proposed power house site).

CHAPTER 3

HYDROLOGICAL STUDIES

## CHAPTER 3 HYDROLOGICAL STUDIES

### 3.1 General

Daman Ganga dam (also called Madhuban dam) is a major irrigation project across river Daman Ganga, a tributary of Narmada River, in Gujarat state. The dam has three nos. head regulators (Right Bank Head Regulator (RBHR), Left Bank Head Regulator (LBHR) and un-operated penstock outlets (BPO) for power generation) and about 191 m long spillway. Out of three, Presently, RBHR is under operation to feed irrigation canal and excess water releases through spillway.

Two Dam Toe Small Hydro power Projects on Daman Ganga Dam are proposed as below:

1. Daman Ganga Dam Toe Small Hydropower Project- 1: through existing BPO (Penstock Outlets)
2. Daman Ganga Dam Toe Small Hydropower Project-2: through RBHR (Right bank Head Regulator)

Both the projects are located on the right bank of the dam.

The Daman Ganga Dam Toe SHP-1 is proposed in this DPR. This chapter deals with the hydrological studies for power generation and optimization studies for plant capacity of Daman Ganga Dam Toe SHP-1.

### 3.2 Drainage Basin

River Daman Ganga is a major tributary of River Narmada. The catchment area up to Dam site is 1813 sq. km. The catchment area of 1318 sq. km., 376 sq. km. And 119 sq. km. lies in Maharastra, Gujrat and Union Territories of India respectively.

### 3.3 Precipitation Data

The maximum and average values of rainfall are 3780 mm and 2202 mm respectively.

### 3.4 Hydrological Data

Reservoir operation data is available for the period of 16 years from 1987 to 2003, which is presented in TABLE 3-1 (16 sheets). The reservoir operation table contains the 10 daily release of water through the RBHR (Right Bank Head Regulator), LBHR (Left Bank

Head Regulator) and BPO (Penstock Outlets). Presently LBHR is not working. The table also shows the various losses and net inflow and outflow from the reservoir.

The releases from SHP-2 (RBHR) is mainly for irrigation purpose and presently excess waters are being released through spillway, back into the river.

It has been proposed that the excess available inflows during monsoon shall be utilised for generation of power through existing BPO (Penstock Outlets) of Daman Ganga SHP-1.

### 3.5 Availability of Water for SHP-1

Water availability for Daman SHP-1 has been worked out considering excess available inflows during monsoon after utilization of flows for Daman Ganga SHP-1 as indicated in TABLE 4.1. Design Discharge of 13.55 cumec has been considered keeping in view the limiting velocity of about 3m/s through existing BPO (Penstock Outlets) of R.C.C rectangular size. (2 Nos. of size 1.5mx1.5m.)

### 3.6 Dependable Year

90%, 75% & 50% dependable years have been worked out on the basis of annual runoff and is presented in TABLE 3.3.

### 3.7 Power Potential Studies

Detailed power potential studies have been carried out as discussed in the next chapter on "Power Potential Studies". Based on these studies the power will not be generated if head is less than 65% of rated head and discharge is less than 40% of rated discharge of one unit. Based on these criteria, sometimes available discharge will be not be used for power generation. Hence based on the generation series, discharge used for power generation at SHP-1 is presented in TABLE 4.1 in next chapter.



TABLE 3-4: Reservoir Operation 1987 to 2003

Year	Month	Period date	Reservoir level		Reservoir capacity at end of period	Reservoir capacity at beginning	Reservoir capacity difference Col. 7 - Col. 8	Water Released through RAHR	Spillway through (M.Cum.)	Total releases (M.Cum.)	Average reservoir level during period (m) (Col. 4-5)	Average reservoir area corresponding to Ave. level	Evaporation on depth in mm.	Evaporation losses Mm <sup>3</sup> Col. 15x10 <sup>6</sup>	Other losses	Total Outflow	In flow
			at beginning of period	at end of period													
1988	June	1-10			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		11-20			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		21-31			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	July	1-10	58.60	60.65	0.00	0.00	0.00	0.00	0.00	0.00	59.59	0.00	0.00	0.00	0.00	0.00	0.00
		11-20	60.65	67.50	60.00	174.00	114.00	0.00	0.00	613.54	64.08	15.08	30.00	0.45	0.00	613.99	727.99
		21-31	67.50	67.25	168.50	168.50	-5.50	0.00	0.00	775.97	67.38	20.88	25.00	0.52	0.00	776.49	770.99
	Aug	1-10	67.25	68.65	158.50	158.50	-13.50	0.00	0.01	411.43	68.95	20.10	19.00	0.39	0.00	411.81	398.31
		11-20	68.65	69.10	165.00	165.00	32.00	0.00	0.00	114.55	67.36	20.86	23.00	0.46	0.00	115.03	147.03
		21-30	69.10	71.25	197.00	259.50	72.50	0.00	0.02	184.78	68.88	25.26	16.00	0.40	0.00	195.19	267.69
	Sept	1-10	71.25	73.40	259.50	322.00	62.50	0.00	0.00	132.64	72.33	31.03	24.00	0.74	0.00	133.58	196.08
		11-20	73.40	74.65	322.00	363.60	41.50	0.00	0.00	155.98	74.03	34.48	21.00	-0.72	0.00	156.70	198.20
		21-31	74.65	74.75	363.60	365.50	2.00	0.00	0.00	240.22	74.70	36.75	27.00	0.97	0.00	241.19	243.19
1989	Oct	1-10	74.75	75.00	365.50	374.00	8.50	0.00	0.00	135.24	74.88	36.16	37.00	1.34	0.00	140.58	149.08
		11-20	75.00	75.00	374.00	374.00	0.00	0.64	0.73	77.16	75.00	36.40	46.00	1.67	0.00	78.05	78.05
		21-30	75.00	75.05	374.00	375.60	1.50	0.64	0.12	43.37	75.03	36.48	45.00	1.64	0.00	48.09	47.99
	Nov	1-10	75.05	75.00	375.60	374.00	-1.60	1.23	0.00	30.45	75.03	36.48	43.00	1.67	0.00	42.25	40.75
		11-20	75.00	74.96	374.00	372.50	-1.50	0.00	0.00	11.90	74.88	36.36	48.00	1.75	0.00	13.55	12.04
		21-31	74.96	74.90	372.50	371.00	-1.50	2.28	0.17	0.00	2.45	36.28	41.00	1.49	0.00	3.94	2.44
	Dec	1-10	74.90	74.90	371.00	371.00	0.00	0.86	0.32	0.00	1.17	36.20	36.00	1.30	0.00	2.46	2.47
		11-20	74.90	74.75	369.50	365.50	-4.00	3.97	0.37	0.00	4.04	36.06	39.00	1.41	0.05	5.50	0.96
		21-31	74.75	74.70	365.50	364.00	-1.50	1.22	0.22	0.00	1.44	35.93	37.00	1.33	0.00	1.77	1.37
	Jan	1-10	74.70	74.65	364.00	363.50	-0.50	2.71	0.19	0.00	2.89	35.68	36.00	1.25	0.37	4.51	0.00
		11-20	74.65	74.40	363.50	359.00	-4.50	2.72	0.16	0.00	2.90	35.32	40.00	1.41	0.00	4.31	0.81
		21-29	74.40	74.35	359.00	353.50	-5.50	0.89	0.06	0.00	1.06	35.16	36.00	1.34	0.12	2.51	0.00
1990	Feb	1-10	74.35	74.10	353.50	345.00	-8.50	2.77	0.33	0.00	3.10	34.86	46.00	1.60	0.30	4.50	0.00
		11-20	74.10	74.00	345.00	343.50	-1.50	0.00	0.00	0.00	0.00	34.58	48.00	1.66	0.00	1.66	0.16
		21-31	74.05	73.90	343.50	339.00	-4.50	1.88	0.22	0.00	1.90	34.36	46.00	1.58	0.00	3.60	0.00
	March	1-10	73.90	73.70	339.00	331.00	-8.00	2.46	0.28	0.00	2.76	33.80	50.00	0.80	0.00	5.20	0.00
		11-20	73.70	73.65	331.00	329.00	-2.00	0.00	0.19	0.00	0.00	33.78	57.00	1.92	0.00	2.08	0.08
		21-30	73.65	73.40	329.00	322.00	-7.00	4.64	0.01	0.00	4.88	33.48	48.00	1.81	0.63	7.00	0.00
	April	1-10	73.40	73.30	322.00	319.00	-3.00	0.00	0.21	0.00	0.21	33.10	60.00	2.26	0.64	3.00	0.00
		11-20	73.30	73.05	319.00	311.50	-7.50	5.91	0.37	0.00	0.26	32.78	72.00	2.39	0.00	8.64	1.14
		21-31	73.05	72.85	311.50	305.50	-6.00	2.24	0.17	0.00	2.42	32.28	68.00	2.20	1.39	6.01	0.00
	May	1-10	72.85	72.70	305.50	301.00	-4.50	2.32	0.20	0.00	2.52	31.87	76.00	2.39	0.00	4.91	0.41
		11-20	72.70	72.45	301.00	294.50	-6.50	4.03	0.17	0.00	4.20	31.58	78.00	2.46	0.00	6.66	0.16
		21-30	72.45	70.90	294.50	252.00	-42.50	0.61	0.20	0.00	38.59	29.72	72.00	2.14	0.96	42.50	0.00

TABLE 3-1: Reservoir Operation 1987 to 2003

TABLE 3-1: Reservoir Operation 1987 to 2003																			
Year	Month	Period date	Reservoir level		Reservoir capacity		Reservoir capacity Difference Col. 7 - Col. 6	Water Released through			Spillover Quantity through (M.Cum.)	Total releases (M.Cum.)	Average reservoir level during period (m) (Col. 445)	Average reservoir area corresponding to Ave. level	Evaporation loss on depth in mm.	Evaporation losses 15x16/1000	Other losses	Total Outflow	In flow
			at beginning of period	at end of period	at beginning	at end		RHBR	LBHR	BPO									
1989	June	1-10	70.90	65.45	252.00	131.00	-121.00	7.53	0.22	0.00	10.82	16.37	68.18	22.45	0.00	102.81	120.88	0.00	
		11-20	65.45	65.55	131.00	153.00	22.00	4.20	0.00	0.00	0.00	4.20	66.00	19.40	0.00	0.00	4.20	26.20	
		21-31	65.55	64.35	153.00	111.00	-42.00	8.55	0.00	35.42	0.00	41.98	65.45	17.48	0.00	0.00	41.98	0.00	
	July	1-10	64.35	66.15	111.00	144.50	33.50	1.48	0.00	0.00	11.89	13.34	65.25	17.10	16.00	0.27	0.00	13.61	47.11
		11-20	66.15	66.16	144.50	152.00	7.50	3.09	0.00	0.00	98.13	99.19	66.33	19.02	19.00	0.36	0.00	99.55	107.05
		21-31	66.16	68.65	152.00	165.00	13.00	0.57	0.00	0.00	599.11	559.68	66.58	19.38	15.00	0.31	0.00	559.99	592.99
	Aug	1-10	68.65	68.60	165.00	165.00	0.00	3.36	0.44	0.00	71.72	75.62	67.59	21.35	15.00	0.32	0.00	78.94	115.84
		11-20	68.60	71.85	165.00	278.50	113.50	0.00	0.00	0.00	142.79	142.79	70.19	28.45	13.00	0.34	0.00	143.13	224.50
		21-30	71.85	74.10	278.50	345.00	66.50	0.00	0.00	0.00	451.78	451.78	72.98	32.35	13.00	0.42	0.00	452.20	520.70
	Sept.	1-10	74.10	75.10	345.00	377.00	32.00	0.00	0.00	0.00	90.46	90.46	74.60	35.50	26.00	0.92	0.00	91.38	123.38
		11-20	75.10	76.20	377.00	418.00	41.00	0.00	0.00	0.00	90.46	90.46	75.65	37.90	26.00	1.06	0.00	91.52	40.06
		21-31	76.20	77.90	418.00	484.00	66.00	0.88	0.00	0.00	133.11	133.98	77.05	31.12	31.00	0.86	0.00	134.55	180.61
Oct.	1-10	77.90	77.45	484.00	464.50	-19.50	0.34	0.00	0.00	11.39	11.73	77.68	42.70	45.00	1.82	0.00	13.65	115.87	
	11-20	77.45	71.45	464.50	464.50	0.00	2.24	0.00	0.00	12.97	15.21	77.45	42.12	43.00	1.81	0.00	17.02	15.44	
	21-30	71.45	71.25	464.50	457.00	-7.50	0.37	0.00	0.00	0.00	0.37	77.35	41.89	47.00	1.97	0.00	2.84	7.81	
Nov.	1-10	71.25	71.00	457.00	447.00	-10.00	2.30	0.17	0.00	0.00	2.47	77.19	41.30	40.00	1.65	5.88	10.00	0.00	
	11-20	71.00	76.95	447.00	445.00	-2.00	1.52	0.23	0.00	0.00	1.78	76.99	40.85	43.00	1.76	0.00	3.51	1.51	
	21-31	76.95	76.80	445.00	438.00	-7.00	0.24	0.13	0.00	0.00	0.37	76.88	40.70	50.00	2.04	3.99	6.40	0.00	
Dec.	1-10	76.80	76.45	438.00	426.00	-12.00	2.81	0.21	0.00	0.00	3.02	76.83	40.05	47.00	1.88	0.00	7.10	12.00	
	11-20	76.45	76.30	426.00	420.00	-6.00	0.00	0.00	0.00	0.00	0.00	76.36	39.45	46.00	1.81	4.18	6.00	0.00	
	21-31	76.30	73.90	420.00	404.00	-16.00	4.11	0.27	0.00	0.00	4.38	76.10	38.90	48.00	1.86	9.76	16.00	0.00	
Jan.	1-10	73.90	73.75	404.00	396.50	-7.50	0.00	0.00	0.00	0.00	0.00	75.63	38.24	42.00	1.81	3.89	5.50	0.00	
	11-20	73.75	75.45	396.50	399.00	2.50	4.74	0.26	0.00	0.00	4.99	75.60	37.80	45.00	1.74	2.77	9.50	0.00	
	21-28	75.45	75.00	399.00	374.00	-25.00	0.87	0.17	0.00	0.00	0.84	75.23	36.94	49.00	1.91	12.35	15.00	0.00	
Feb.	1-10	75.00	74.70	374.00	364.00	-10.00	3.48	0.31	0.00	0.00	3.79	74.95	36.10	44.00	1.59	4.62	10.00	0.00	
	11-20	74.70	74.40	364.00	356.00	-8.00	2.19	0.25	0.00	0.00	2.44	74.55	35.42	45.00	1.59	3.99	8.02	0.00	
	21-31	74.40	74.20	356.00	340.00	-16.00	0.00	0.00	0.00	0.00	0.00	74.30	35.00	43.00	1.51	6.49	8.00	0.00	
March	1-10	74.20	73.60	340.00	334.00	-6.00	6.34	0.38	0.00	0.00	6.72	74.00	34.40	56.00	2.00	5.29	14.01	0.00	
	11-20	73.60	73.55	334.00	329.00	-5.00	0.00	0.00	0.00	0.00	0.00	73.86	33.76	62.00	2.09	5.91	8.00	0.00	
	21-30	73.55	73.15	329.00	314.50	-14.50	6.60	0.36	0.00	0.00	6.86	73.35	33.10	68.00	2.23	2.89	12.00	0.00	
April	1-10	73.15	72.90	314.50	307.00	-7.50	0.00	0.09	0.00	0.00	0.00	73.03	32.44	69.00	2.24	6.26	7.50	0.00	
	11-20	72.90	72.80	307.00	296.00	-11.00	4.41	0.25	0.00	0.00	4.66	72.70	31.75	71.00	2.25	4.09	11.00	0.00	
	21-31	72.80	72.10	296.00	284.00	-12.00	4.60	0.13	0.00	0.00	4.73	72.30	30.95	71.00	2.20	5.07	12.00	0.00	
May	1-10	72.10	71.90	284.00	278.00	-6.00	0.00	0.00	0.00	0.00	0.00	72.00	30.30	57.00	1.73	4.27	6.00	0.00	
	11-20	71.90	71.35	278.00	262.00	-16.00	10.95	0.44	0.00	0.00	11.39	71.63	28.83	62.00	1.84	2.77	16.00	0.00	
	21-30	71.35	65.80	262.00	138.00	-124.00	0.00	0.03	0.00	0.00	175.00	65.58	23.26	67.00	1.59	0.00	176.58	52.56	



TABLE 3-1: Reservoir Operation 1987 to 2003

Year	Month	Period date	Reservoir level at beginning of period	Reservoir level at end of period	Reservoir capacity at beginning	Reservoir capacity at end	Reservoir capacity difference Col. 7 - Col. 6	Water released through RBHR	Water released through LBHR	BPO	Spillway quantity through (M.Cum.)	Total releases (M.cum.)	Average reservoir level during period (Col. 14)	Average reservoir area corresponding to Ave. level	Evaporation in depth in mm.	Evaporation losses Mm <sup>3</sup> Col. 15x16/1000	Other losses	Total Outflow	In flow
1988	June	1-10	70.90	65.45	131.00	131.00	-121.00	7.63	0.22	0.00	10.82	16.37	68.19	22.45	0.00	0.00	102.61	123.98	0.00
		11-20	66.55	66.55	131.00	153.00	22.00	4.20	0.00	0.00	0.00	4.20	66.00	18.40	0.00	0.00	0.00	4.20	26.20
		21-31	66.55	64.35	153.00	111.00	-42.00	6.55	0.00	35.42	0.00	41.39	65.45	17.48	0.00	0.00	0.00	41.39	0.00
	July	1-10	64.35	66.15	111.00	144.50	33.50	1.46	0.00	0.00	11.89	13.34	65.25	17.10	16.00	0.27	0.00	13.61	47.11
		11-20	66.15	66.50	144.50	152.00	7.50	3.09	0.00	0.00	90.13	99.19	66.33	19.02	19.00	0.36	0.00	99.55	107.05
		21-31	66.50	66.55	152.00	155.00	3.00	0.57	0.00	0.00	559.11	559.68	66.58	19.38	16.00	0.31	0.00	559.99	562.99
	Aug	1-10	66.55	68.50	155.00	193.00	40.00	3.35	0.44	0.00	71.72	79.52	67.56	21.35	15.00	0.32	0.00	76.84	115.84
		11-20	68.50	71.05	193.00	276.50	81.50	0.00	0.00	0.00	142.79	142.78	70.16	26.45	13.00	0.34	0.00	143.13	224.63
		21-31	71.05	74.10	276.50	345.00	68.50	0.00	0.00	0.00	451.78	451.78	72.98	32.35	13.00	0.42	0.00	452.20	520.70
	Sept.	1-10	74.10	75.10	345.00	377.00	32.00	0.00	0.00	0.00	90.46	90.46	74.60	35.50	26.00	0.32	0.00	91.36	123.36
		11-20	75.10	76.25	377.00	415.00	39.00	0.00	0.00	0.00	90.46	90.46	75.65	37.90	28.00	1.06	0.00	91.52	40.06
		21-31	76.25	77.90	415.00	484.00	69.00	0.98	0.00	0.00	133.11	133.93	77.65	31.12	31.00	0.98	0.00	134.95	160.61
1989	Oct.	1-10	77.90	77.45	484.00	464.80	-19.50	0.34	0.00	0.00	11.39	11.73	77.63	42.70	45.00	1.82	0.00	13.65	115.87
		11-20	77.45	77.45	464.80	464.50	-0.00	0.24	0.00	0.00	12.57	13.21	77.45	42.12	43.00	1.81	0.00	17.02	15.44
		21-31	77.45	77.25	464.80	457.00	-7.50	0.37	0.00	0.00	0.00	0.37	77.35	41.06	47.00	1.97	0.00	2.34	7.81
	Nov.	1-10	77.25	77.00	457.00	447.00	-10.00	2.39	0.17	0.00	0.00	2.47	77.13	41.30	40.00	1.85	5.98	10.00	0.00
		11-20	77.00	76.95	447.00	445.00	-2.00	1.52	0.23	0.00	0.00	1.75	76.88	40.95	43.00	1.76	0.00	3.51	1.51
		21-31	76.95	76.80	445.00	436.00	-9.00	0.24	0.13	0.00	0.00	0.37	76.80	40.70	50.00	2.04	3.99	6.40	0.00
	Dec.	1-10	76.80	76.45	436.00	426.00	-12.00	2.81	0.21	0.00	0.00	3.02	76.63	40.95	47.00	1.68	7.10	12.00	0.00
		11-20	76.45	76.30	426.00	420.00	-6.00	0.00	0.00	0.00	0.00	0.00	76.38	39.45	46.00	1.81	4.19	6.00	0.00
		21-31	76.30	73.90	420.00	404.00	-16.00	4.11	0.27	0.00	0.00	4.39	78.10	38.80	48.00	1.85	9.78	16.00	0.00
	Jan.	1-10	73.90	73.75	404.00	398.50	-5.50	0.00	0.00	0.00	0.00	0.00	73.83	38.24	42.00	1.81	3.89	5.60	0.00
		11-20	73.75	75.45	398.50	399.00	0.50	4.74	0.25	0.00	0.00	4.99	75.80	37.80	46.00	1.74	2.77	9.50	0.00
		21-31	75.45	75.00	399.00	374.00	-15.00	0.67	0.17	0.00	0.00	0.84	75.23	36.94	49.00	1.81	12.35	15.00	0.00
	Feb.	1-10	75.00	74.70	374.00	364.00	-10.00	3.48	0.31	0.00	0.00	3.79	74.65	35.42	45.00	1.59	4.62	10.00	0.00
		11-20	74.70	74.40	364.00	358.00	-6.00	2.19	0.25	0.00	0.00	2.44	74.55	35.42	45.00	1.59	3.90	8.02	0.00
		21-31	74.40	74.20	358.00	348.00	-10.00	0.00	0.00	0.00	0.00	0.00	74.30	35.00	43.00	1.51	5.45	8.00	0.00
	March	1-10	74.20	73.80	348.00	334.00	-14.00	6.34	0.38	0.00	0.00	6.72	74.00	34.40	58.00	2.00	6.28	14.01	0.00
		11-20	73.80	73.65	334.00	326.00	-8.00	0.00	0.00	0.00	0.00	0.00	73.68	33.76	62.00	2.09	6.91	8.00	0.00
		21-31	73.65	73.15	326.00	314.50	-11.50	8.50	0.38	0.00	0.00	8.88	73.35	33.10	68.00	2.25	2.89	12.00	0.00
	April	1-10	73.15	72.80	314.50	307.00	-7.50	0.00	0.00	0.00	0.00	0.00	73.05	32.44	69.00	2.24	5.26	7.50	0.00
		11-20	72.80	72.50	307.00	296.00	-11.00	4.41	0.25	0.00	0.00	4.66	72.70	31.75	71.00	2.23	4.09	11.00	0.00
		21-31	72.50	72.10	296.00	284.00	-12.00	4.60	0.13	0.00	0.00	4.73	72.30	30.84	71.00	2.20	5.07	12.00	0.00
	May	1-10	72.10	71.90	284.00	278.00	-6.00	0.00	0.00	0.00	0.00	0.00	72.00	30.30	57.00	1.73	4.27	6.00	0.00
		11-20	71.90	71.35	278.00	262.00	-16.00	10.95	0.44	0.00	0.00	11.39	71.63	29.63	62.00	1.84	2.77	16.00	0.00
		21-31	71.35	65.60	262.00	133.00	-124.00	0.00	0.00	175.00	0.00	175.00	69.58	23.26	67.00	1.58	0.00	178.86	52.56

TABLE 3-1: Reservoir Operation 1987 to 2003

Year	Month	Period date	Reservoir level		Reservoir capacity at beginning	Reservoir capacity at end	Reservoir capacity difference Col. 7 - Col. 6	Water Released through			Spillway quantity through (M.Cum.)	Total releases (M.cum)	Average reservoir level during period (m) (Col. 4) & (Col. 5)	Average reservoir area corresponding to Ave. level	Evaporation on depth in mm.	Evaporation losses Mm <sup>3</sup> Col. 16 x 1000	Other losses	Total Outflow	In flow
			at beginning of period	at end of period				ROHR	LBHR	8FO									
1990	June	1-10	85.80	84.90	138.00	120.00	-18.00	3.03	0.21	0.00	0.00	3.24	65.35	17.25	37.80	0.55	14.12	18.00	0.00
		11-20	84.95	84.95	120.00	120.00	0.00	2.52	0.21	12.35	0.00	15.08	61.93	16.55	38.00	0.63	0.00	15.71	16.71
		21-31	84.95	85.70	121.00	138.00	15.00	1.85	0.10	0.00	0.00	1.76	65.93	17.23	37.40	0.64	0.00	2.40	17.40
	July	1-10	85.70	86.25	138.00	148.50	10.50	1.82	0.05	0.00	255.59	255.41	65.98	18.34	22.80	0.41	0.00	255.02	256.32
		11-20	86.25	70.45	148.50	239.50	83.00	6.89	0.42	0.00	164.27	174.39	68.35	22.83	23.20	0.53	0.00	174.92	257.92
		21-31	70.45	72.40	239.50	283.00	43.50	3.96	0.10	0.00	248.83	244.88	71.43	29.11	22.20	0.65	0.00	245.52	298.02
	Aug	1-10	72.40	72.70	283.00	301.00	18.00	8.74	0.25	0.00	238.93	240.92	72.55	31.47	14.10	0.44	0.00	247.96	255.35
		11-20	72.70	71.60	301.00	304.00	3.00	0.70	0.00	0.00	770.71	774.50	72.25	30.82	14.30	0.44	0.00	774.84	777.84
		21-30	71.60	77.15	304.00	453.00	149.00	0.00	0.00	0.00	424.37	424.37	74.48	35.53	14.60	0.32	0.00	424.89	573.09
	Sept.	1-10	77.15	78.80	453.00	512.00	59.00	0.00	0.00	0.00	122.97	122.97	77.88	43.18	21.00	0.91	0.00	123.88	182.88
		11-20	78.80	78.80	512.00	524.00	12.00	0.00	0.00	0.00	83.48	83.48	78.76	45.37	20.00	0.91	0.00	84.39	106.39
		21-31	78.80	79.15	524.00	539.00	15.00	0.00	0.00	0.00	323.47	323.47	79.08	48.18	23.00	1.08	0.00	324.54	339.54
1991	Oct.	1-10	79.25	79.30	539.00	564.00	25.00	0.00	0.00	0.00	116.51	116.51	79.53	47.31	32.90	1.56	0.00	117.07	142.07
		11-20	79.30	79.30	564.00	568.00	4.00	0.00	0.00	0.00	62.12	62.12	78.05	48.19	41.50	2.00	0.00	64.11	65.11
		21-30	79.30	79.80	568.00	588.00	20.00	4.24	0.00	0.00	12.92	17.16	79.90	48.37	49.90	2.40	0.00	19.56	16.98
	Nov.	1-10	79.80	79.75	588.00	592.00	4.00	0.41	0.05	0.00	0.00	0.47	79.83	48.12	43.90	2.11	3.42	8.00	0.00
		11-20	79.75	79.40	592.00	545.00	-47.00	5.17	0.31	0.00	0.00	5.48	78.68	47.43	39.60	1.89	9.65	17.00	0.00
		21-31	79.40	79.15	545.00	535.00	-10.00	0.00	0.00	0.00	0.00	0.00	79.28	48.69	37.80	1.78	8.24	10.00	0.00
	Dec.	1-10	79.15	78.75	535.00	518.00	-17.00	4.20	0.28	0.00	0.00	4.47	78.55	45.87	35.60	1.63	10.89	17.00	0.00
		11-20	78.75	78.35	518.00	502.00	-16.00	1.91	0.16	0.00	0.00	1.79	78.55	44.87	22.30	1.00	13.21	16.00	0.00
		21-31	78.35	77.85	502.00	482.00	-20.00	2.77	0.13	0.00	0.00	2.91	78.10	43.74	33.20	1.07	15.42	20.00	0.00
	Jan.	1-10	77.85	77.30	482.00	459.00	-23.00	6.59	0.18	0.00	0.00	6.77	77.88	42.43	29.70	1.28	14.10	22.13	0.00
		11-20	77.30	77.00	459.00	447.00	-12.00	0.00	0.04	0.00	0.00	0.04	77.16	41.37	34.70	1.44	10.05	11.52	0.00
		21-28	77.00	76.45	447.00	425.00	-21.00	7.61	0.31	0.00	0.00	7.91	76.73	40.31	47.20	1.50	11.16	21.00	0.00
	Feb.	1-10	76.45	76.20	425.00	419.00	-6.00	0.00	0.00	0.00	0.00	0.00	76.33	39.31	41.90	1.65	8.35	10.00	0.00
		11-20	76.20	75.95	419.00	405.50	-13.50	6.85	0.33	0.00	0.00	7.16	76.06	38.65	44.90	1.72	1.60	10.50	0.00
		21-31	75.95	75.80	405.50	400.00	-5.50	1.24	0.10	0.00	0.00	1.34	75.88	38.25	38.70	1.48	2.69	5.50	0.00
	March	1-10	75.80	75.65	400.00	385.50	-14.50	3.68	0.18	0.00	0.00	3.87	75.73	36.39	50.90	1.60	0.00	5.87	1.32
		11-20	75.65	75.50	385.50	381.00	-4.50	5.94	0.20	0.00	0.00	6.22	75.59	37.87	60.70	2.30	0.00	8.51	4.01
		21-30	75.50	75.40	381.00	387.00	6.00	0.00	0.00	0.00	0.00	0.00	75.45	37.43	73.10	2.74	1.28	4.00	0.00
	April	1-10	75.40	74.65	387.00	372.50	-14.50	2.22	0.46	0.00	0.00	2.65	75.18	38.84	59.30	2.15	0.00	4.87	0.36
		11-20	74.95	74.70	372.50	384.00	11.50	1.95	0.00	0.00	0.00	1.98	74.83	38.24	66.00	2.39	4.16	5.50	0.00
		21-31	74.70	74.55	384.00	359.50	-24.50	5.87	0.14	0.00	0.00	6.01	74.63	35.78	69.80	2.18	0.00	6.19	3.69
	May	1-10	74.55	74.05	359.50	343.50	-16.00	11.04	0.17	0.00	2.09	13.30	74.30	34.66	58.60	2.05	0.00	16.00	0.00
		11-20	74.05	66.90	343.50	180.00	-163.50	3.28	0.00	0.00	178.59	181.87	70.49	27.29	59.80	1.63	0.00	183.50	0.00
		21-30	66.90	64.95	180.00	121.00	-59.00	10.63	0.16	7.48	19.92	38.17	65.83	18.30	58.60	1.28	0.00	39.42	0.42

TABLE 3-1: Reservoir Operation 1987 to 2003

Year	Month	Period date	Reservoir level at beginning of period	Reservoir level at end of period	Reservoir capacity at beginning	Reservoir capacity at end	Reservoir capacity Difference Col. 7 - Col. 6	RBHR	LBHR	BPO	Spillway Quantity through (M.Cum.)	Total releases (M.Cum.)	Average reservoir level during period (Col. 4+5)	Average reservoir area corresponding to Ave. level	Evaporation losses mm Col. 15 x 16 / 1000	Other losses	Total Outflow	In flow		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1991	June	1-10	66.85	66.85	122.00	161.00	39.00	6.84	0.00	0.00	67.60	74.54	55.98	16.40	17.50	0.33	74.87	113.87		
		11-20	66.85	65.25	161.00	128.00	-33.00	7.34	0.00	1.17	8.00	16.51	56.10	18.50	14.10	0.26	16.23	33.00	0.00	
		21-31	65.25	65.84	128.00	138.80	10.80	11.14	0.00	0.00	0.00	0.00	11.14	55.55	17.59	19.70	0.35	0.00	22.29	
	July	1-10	65.84	66.39	138.80	149.80	13.00	4.50	0.00	0.00	0.00	59.42	63.92	56.12	18.52	28.50	0.53	64.45	75.45	
		11-20	66.39	67.21	149.80	167.15	17.35	1.97	0.00	0.00	0.00	511.48	513.35	58.80	18.84	6.70	0.13	0.00	513.48	530.83
		21-31	67.21	67.62	167.15	176.60	9.45	0.00	0.00	0.00	0.00	1048.91	1048.91	57.42	20.97	4.20	0.09	0.00	1049.00	1059.45
	Aug	1-10	67.62	67.04	176.60	162.00	-14.60	0.00	0.00	0.00	0.00	290.07	290.07	57.33	20.60	12.50	0.28	0.00	290.33	265.73
		11-20	67.04	67.08	162.00	164.70	2.70	0.00	0.00	0.00	0.00	258.99	259.99	57.07	20.28	10.20	0.21	0.00	270.20	272.80
		21-30	67.08	66.82	164.70	202.40	37.70	0.00	0.00	0.00	0.00	421.27	421.27	67.96	21.99	7.20	0.15	0.00	421.43	459.13
	Sept	1-10	66.82	73.05	202.40	311.80	109.40	0.00	0.00	0.00	0.00	0.00	0.00	70.84	20.30	17.10	0.48	0.00	0.48	106.88
		11-20	73.05	74.35	311.80	385.00	73.20	0.14	0.00	0.00	0.00	0.00	0.14	73.72	34.06	33.90	1.15	0.00	1.29	44.49
		21-31	74.35	74.92	355.00	371.60	16.60	6.31	0.02	0.00	0.00	0.00	6.33	74.65	35.70	38.10	1.36	0.00	7.69	24.29
Oct	1-10	74.92	75.03	371.60	374.90	3.30	0.64	0.21	0.00	0.00	0.00	0.95	74.98	36.35	37.54	1.36	0.00	2.22	5.52	
	11-20	75.03	74.90	374.90	371.00	-3.90	7.26	0.20	0.00	0.00	0.00	7.47	74.97	36.33	40.60	1.47	0.00	8.94	5.04	
	21-30	74.90	74.60	371.00	367.00	-4.00	6.84	0.29	0.00	0.00	0.00	7.13	74.85	36.10	59.40	2.14	0.00	9.27	5.27	
Nov	1-10	74.60	74.80	367.00	367.00	0.00	0.00	0.06	0.00	0.00	0.00	0.06	74.80	36.00	63.40	1.82	0.00	1.98	1.37	
	11-20	74.80	74.59	367.00	360.70	-6.30	8.81	0.31	0.00	0.00	0.00	9.22	74.70	35.74	41.80	1.48	0.00	10.71	4.41	
	21-31	74.59	74.46	360.70	357.20	-3.50	5.63	0.06	0.00	0.00	0.00	5.69	74.53	35.39	36.80	1.30	0.00	6.99	3.49	
Dec	1-10	74.46	74.16	357.20	345.60	-11.60	8.87	0.24	0.00	0.00	0.00	4.91	74.26	35.00	37.70	1.32	0.17	10.40	0.00	
	11-20	74.16	74.03	345.60	342.90	-2.70	3.50	0.10	0.00	0.00	0.00	3.59	74.10	34.59	46.90	1.62	0.00	5.02	1.12	
	21-31	74.03	73.98	342.90	341.80	-1.10	0.31	0.17	0.64	0.00	0.00	1.11	74.01	34.42	32.50	1.12	0.06	2.23	1.12	
1992	Jan	1-10	73.99	73.64	341.80	328.60	-13.20	9.59	0.11	1.81	0.00	11.50	73.82	34.03	36.70	1.25	0.46	13.20	0.00	
		11-20	73.64	73.55	328.60	326.00	-2.60	1.28	0.11	1.47	0.00	2.67	73.60	34.08	43.00	1.53	0.03	4.40	1.80	
		21-28	73.55	73.15	326.00	314.50	-11.50	9.77	0.07	1.82	0.00	11.45	73.35	33.09	47.10	1.56	0.00	13.01	1.51	
Feb	1-10	73.15	73.08	314.50	312.40	-2.10	0.82	0.13	1.47	0.00	2.43	73.12	32.63	41.60	1.36	0.00	3.78	1.68		
	11-20	73.08	72.67	312.40	306.10	-6.30	3.38	0.04	1.47	0.00	4.89	72.58	32.32	42.20	1.38	0.05	6.30	0.00		
	21-31	72.67	72.66	306.10	297.20	-8.90	6.70	0.18	1.32	0.00	6.20	72.72	31.60	46.80	1.49	0.00	9.66	0.79		
March	1-10	72.66	72.47	297.20	295.10	-2.10	0.00	0.04	1.47	0.00	1.51	72.52	31.43	55.00	1.73	0.00	3.24	1.14		
	11-20	72.47	72.10	295.10	284.00	-11.10	9.82	0.09	1.47	0.00	10.16	72.29	30.92	61.00	1.89	0.00	12.07	0.97		
	21-30	72.10	71.85	284.00	278.50	-5.50	4.24	0.16	1.62	0.00	6.01	71.98	30.25	71.90	2.17	0.00	8.18	0.69		
April	1-10	71.85	71.54	278.50	268.20	-10.30	5.12	0.04	1.47	0.00	6.64	71.70	29.74	59.00	1.72	0.00	6.36	0.06		
	11-20	71.54	71.05	268.20	255.00	-13.20	11.18	0.09	1.47	0.00	12.74	71.30	28.99	64.70	1.86	0.00	14.62	1.42		
	21-31	71.05	70.64	255.00	250.20	-4.80	3.43	0.12	1.47	0.00	5.01	70.95	28.25	60.20	1.70	0.00	6.71	1.91		
May	1-10	70.64	70.24	250.20	234.80	-15.40	11.78	0.12	1.47	0.00	13.37	70.54	27.29	70.30	1.92	0.12	15.40	0.00		
	11-20	70.24	69.84	234.80	228.90	-5.90	3.69	0.18	1.47	0.00	6.36	70.00	26.21	69.10	1.81	0.57	7.73	0.00		
	21-30	69.84	69.32	228.90	213.40	-15.50	12.09	0.04	1.02	0.00	13.75	69.63	25.21	73.20	1.85	0.00	15.80	2.49		

TABLE 3-1: Reservoir Operation 1987 to 2003

Year	Month	Period date	Reservoir level		Reservoir capacity		Reservoir		Water released through			Spillway quantity through (M.Cum.)	Total releases (M.Cum.)	Average reservoir level during period (m) (Col. 14)	Average reservoir area corresponding to Ave. level	Evaporation losses (mm. on depth) (Col. 16)	Evaporation losses (mm/1000) (Col. 17)	Other losses	Total Outflow	Inflow
			at beginning of period	at end of period	at beginning	at end	operability Difference Col. 7 - Col. 6	Col. 7 - Col. 6	RHR	LBHR	BPO									
1982	June	1-10	68.92	68.99	213.40	205.50	-7.90	4.10	0.21	1.47	0.00	0.00	5.78	69.15	24.27	64.50	1.57	0.00	7.34	10.41
		11-20	68.98	68.77	205.60	201.40	-4.20	8.09	0.02	1.47	0.00	0.00	10.01	68.88	23.74	51.50	1.22	0.00	11.23	7.03
		21-31	68.05	68.05	201.40	143.00	-58.40	0.00	0.00	0.00	0.26	19.33	115.98	67.41	21.00	21.20	0.45	0.00	120.03	61.53
	July	1-10	68.05	68.78	143.00	137.20	-5.80	3.48	0.23	0.00	0.00	18.41	20.11	68.91	18.21	31.80	0.56	0.00	20.69	14.89
		11-20	68.78	68.65	137.20	158.50	21.30	6.12	0.10	0.00	0.00	4.07	12.07	68.31	18.92	14.50	0.27	0.00	12.64	33.94
		21-31	68.65	68.65	158.50	250.50	92.00	0.00	0.00	0.00	0.00	15.33	115.33	68.85	23.96	10.70	0.26	0.00	155.59	207.59
	Aug	1-10	70.85	72.54	250.50	298.80	48.30	0.00	0.00	0.00	0.00	15.71	155.71	71.70	29.78	13.80	0.41	0.00	153.12	202.42
		11-20	72.54	72.69	298.80	300.40	1.60	0.00	0.00	0.00	0.00	58.41	98.41	72.62	31.80	2.30	0.07	0.00	988.48	973.08
		21-30	72.69	74.76	300.40	395.80	95.40	0.00	0.00	0.00	0.00	108.15	108.15	73.73	33.61	13.30	0.45	0.00	108.60	174.10
	Sept.	1-10	74.76	77.19	395.80	432.20	36.40	0.00	0.00	0.00	0.00	103.33	603.33	75.05	36.81	12.30	0.50	0.00	603.88	690.28
		11-20	77.19	78.02	432.20	529.00	96.80	0.00	0.00	0.00	0.00	0.00	0.00	76.08	43.99	39.80	1.70	0.00	1.70	124.30
1983	Oct.	1-10	78.02	78.49	529.00	549.60	20.60	3.07	0.08	0.00	0.00	3.13	78.28	78.28	46.64	49.80	2.33	0.00	5.45	25.86
		11-20	78.49	78.71	549.60	566.40	16.80	4.28	0.15	0.00	0.00	0.00	4.10	79.50	47.51	42.80	2.03	0.00	6.44	17.34
		21-30	78.71	79.76	566.40	562.40	-4.00	2.84	0.12	0.00	0.00	0.00	3.61	78.74	47.85	39.80	1.86	0.00	5.47	7.47
	Nov.	1-10	79.76	78.68	562.40	588.00	25.60	0.82	0.16	0.00	0.00	0.00	2.85	79.76	47.90	44.40	2.13	0.00	5.08	5.08
		11-20	78.68	78.28	588.00	540.60	-47.40	12.72	0.29	0.00	0.00	0.00	0.78	78.72	47.80	44.80	2.14	0.50	3.40	0.00
		21-31	78.28	78.20	540.60	537.00	-3.60	4.15	0.08	0.00	0.00	0.00	13.01	78.49	47.21	41.80	1.97	3.41	18.40	0.00
	Dec.	1-10	78.20	78.80	537.00	527.20	-9.80	8.92	0.17	0.00	0.00	0.00	4.25	78.25	46.61	45.50	2.12	0.00	6.37	0.93
		11-20	78.80	78.64	527.20	521.80	-5.40	5.90	0.20	0.00	0.00	0.00	8.10	78.91	45.77	39.70	1.77	0.00	7.87	2.27
		21-31	78.64	78.68	521.80	515.20	-6.60	4.04	0.08	0.00	0.00	0.00	4.09	78.76	45.40	39.00	1.77	0.54	6.40	0.00
	Jan.	1-10	78.68	78.40	515.20	604.50	89.30	11.11	0.29	0.00	0.00	0.00	11.10	78.54	44.85	43.10	1.93	0.00	13.33	2.13
		11-20	78.40	78.36	604.50	502.40	-102.10	0.36	0.03	0.00	0.00	0.00	0.42	78.38	44.46	38.90	1.84	0.00	2.06	0.46
1983	Feb.	1-10	78.36	78.04	502.40	489.60	-12.80	11.08	0.25	0.00	0.00	0.00	11.28	78.20	43.95	40.30	1.80	0.00	13.08	0.95
		11-20	78.04	77.67	489.60	492.80	3.20	3.96	0.14	0.00	0.00	0.00	4.10	77.96	43.34	52.10	2.27	0.43	6.80	0.00
		21-31	77.67	77.65	492.80	473.00	-19.80	4.78	0.18	0.00	0.00	0.00	4.88	77.77	42.91	59.30	2.54	2.30	9.80	0.00
	March	1-10	77.65	77.38	473.00	492.20	19.20	9.43	0.34	0.00	0.00	0.00	8.77	77.52	42.30	38.50	1.83	0.00	11.40	0.60
		11-20	77.38	77.27	492.20	457.60	-34.60	1.89	0.05	0.00	0.00	0.00	1.94	77.33	41.81	54.90	2.30	0.16	1.40	0.00
		21-30	77.27	77.69	457.60	442.50	-15.10	16.75	0.29	0.00	0.00	0.00	4.88	77.58	41.20	50.90	2.41	0.00	15.43	0.13
	April	1-10	77.69	75.33	442.50	434.70	-7.80	3.97	0.18	0.00	0.00	0.00	4.05	77.29	40.47	62.50	2.70	1.05	7.80	0.00
		11-20	75.33	78.13	434.70	413.20	-21.50	10.72	0.31	0.00	0.00	0.00	10.55	76.61	39.77	62.50	2.49	0.09	13.50	0.00
		21-31	78.13	66.62	413.20	152.40	-260.80	13.32	0.39	0.00	0.00	0.00	4.85	76.23	39.09	68.00	2.59	1.28	8.68	0.00
	May	1-10	66.62	65.57	152.40	133.40	-19.00	5.00	0.07	0.00	0.00	278.23	280.84	71.33	28.09	69.10	2.01	0.00	288.85	28.05
		11-20	65.57	64.96	133.40	116.20	-17.20	12.82	0.38	0.00	0.00	0.00	13.10	65.12	18.87	67.70	1.25	3.01	19.00	0.00
		21-30	64.96	64.24	116.20	108.80	-7.40	4.94	0.11	0.00	0.00	0.00	5.04	64.45	15.82	72.10	1.14	1.22	7.40	0.00

TABLE 3-1: Reservoir Operation 1987 to 2003

Year	Month	Period date	Reservoir level at beginning of period	Reservoir level at end of period	Reservoir capacity at beginning	Reservoir capacity at end	Reservoir capacity difference Col. 7 - Col. 6	Water Released through			Spillway Quantity through (M.cu.in.)	Total releases (M.cu.in.)	Average reservoir level during period (ft) (Col. 4) x 14	Average reservoir area corresponding to Ave. level	Evaporation on depth in mm.	Evaporation losses 15x16 /1000	Other losses	Total Outflow	In flow
								RBR	LBHR	BPO									
1983	June	1-10	54.24	53.68	106.80	99.80	-8.20	8.32	0.17	0.00	0.00	6.49	63.96	14.93	62.20	0.93	0.00	9.41	0.21
		11-20	63.68	58.25	99.80	149.00	46.40	0.00	0.00	0.74	0.00	43.78	65.02	16.75	22.00	0.37	0.00	44.16	93.59
		21-31	66.35	58.22	146.00	145.60	-3.40	0.00	0.00	0.00	87.08	37.09	66.29	18.91	38.50	0.89	0.00	87.78	84.38
	July	1-10	66.22	57.91	146.00	182.20	36.50	0.12	0.00	0.00	166.41	168.55	67.07	20.31	16.30	0.33	0.00	166.86	203.46
		11-20	67.91	57.32	192.20	178.40	-5.80	0.00	0.00	0.00	1206.01	1206.01	67.62	21.65	8.00	0.13	0.00	1206.14	1200.34
		21-31	67.32	70.65	176.40	245.50	69.10	0.70	0.00	0.00	187.49	188.19	68.90	24.48	18.20	0.40	0.00	188.59	257.59
	Aug	1-10	70.65	72.88	245.50	300.40	54.90	0.90	0.00	0.00	109.65	109.65	71.67	28.92	12.40	0.37	0.00	110.02	184.92
		11-20	72.88	76.16	300.40	414.40	114.00	0.00	0.02	0.00	91.81	91.83	74.42	35.32	10.90	0.38	0.00	91.91	103.30
		21-30	76.16	76.35	414.40	422.00	7.60	0.00	0.01	0.00	303.95	203.96	76.28	38.15	17.60	0.69	0.00	204.85	212.25
	Sept.	1-10	76.35	76.51	422.00	550.50	128.50	0.00	0.00	0.00	97.71	97.71	77.83	43.32	8.40	0.41	0.00	98.12	226.52
		11-20	76.51	79.88	550.50	559.00	8.50	0.00	0.00	0.00	166.15	166.15	79.60	47.48	19.00	0.85	0.00	167.00	175.50
		21-31	79.88	79.31	559.00	550.50	-8.50	0.00	0.00	0.00	718.99	718.99	79.60	47.48	8.70	0.41	0.00	719.40	710.80
1984	Oct.	1-10	79.31	78.74	550.50	561.80	11.30	0.00	0.00	0.00	163.44	163.44	78.63	47.56	41.20	1.96	0.00	168.40	176.50
		11-20	78.74	78.81	561.80	564.40	2.60	0.00	0.00	0.00	105.26	105.26	78.78	47.94	28.20	1.26	0.00	106.52	109.32
		21-30	78.81	79.61	564.40	583.80	19.40	0.00	0.00	0.00	120.76	120.76	79.83	48.09	39.10	1.68	0.00	122.64	123.84
	Nov.	1-10	79.61	78.75	583.80	582.00	-1.80	0.88	0.00	0.00	35.20	59.06	78.80	48.01	40.80	1.95	0.00	61.01	57.41
		11-20	78.75	78.75	582.00	581.20	-0.80	0.50	0.00	0.00	25.35	25.85	78.75	47.85	42.80	2.05	0.00	27.90	27.10
		21-31	78.75	79.32	581.20	556.00	-25.20	6.84	0.13	0.00	0.00	5.77	79.69	47.69	33.90	1.62	0.00	8.39	3.19
	Dec.	1-10	79.32	79.68	556.00	553.00	-3.00	1.96	0.19	0.00	0.00	2.17	79.59	47.47	39.80	1.69	0.00	4.08	1.06
		11-20	79.68	79.39	553.00	544.60	-8.40	6.44	0.24	0.00	0.00	6.68	79.48	47.18	38.60	1.82	0.00	8.48	0.14
		21-31	79.39	79.22	544.60	537.80	-6.80	6.36	0.09	0.00	0.00	9.45	79.31	46.76	48.20	2.25	0.00	8.71	1.91
	Jan.	1-10	79.22	78.99	537.80	537.80	0.00	8.68	0.03	0.00	0.00	6.61	79.11	46.26	42.00	1.84	0.00	10.55	0.60
		11-20	78.99	78.90	537.80	524.00	-13.80	3.09	0.07	0.00	0.00	3.17	78.95	46.86	36.40	1.21	0.00	4.36	0.78
		21-28	78.90	76.57	524.00	510.80	-13.20	10.40	0.33	0.00	0.00	10.73	76.74	46.34	43.70	1.98	0.49	13.20	0.00
	Feb.	1-10	78.57	76.44	510.80	506.60	-4.20	3.80	0.04	0.00	0.00	3.63	76.51	44.76	38.30	1.71	0.00	5.55	0.35
		11-20	76.44	76.24	506.60	495.40	-11.20	4.65	0.15	0.00	0.00	4.80	76.34	44.35	42.30	1.88	0.53	10.20	0.00
		21-31	76.24	77.55	495.40	486.00	-9.40	9.67	0.30	0.00	0.00	9.96	78.10	43.74	37.50	1.64	0.00	11.60	2.20
	March	1-10	77.55	77.71	486.00	475.40	-10.60	4.28	0.07	0.00	0.00	4.36	77.83	43.05	52.40	2.30	3.94	10.60	0.00
		11-20	77.71	77.34	475.40	460.50	-14.90	12.12	0.36	0.00	0.00	12.47	77.53	42.31	57.80	2.45	0.00	14.92	0.12
		21-30	77.34	77.08	460.50	450.20	-10.40	5.94	0.14	0.00	0.00	6.07	77.21	41.52	88.00	2.85	1.46	10.40	0.00
	April	1-10	77.08	76.68	450.20	433.80	-16.40	12.48	0.41	0.00	0.00	12.69	76.87	40.67	55.40	2.65	0.85	16.40	0.00
		11-20	76.68	76.42	433.80	424.90	-8.90	4.80	0.16	0.00	0.00	5.05	76.54	39.85	66.40	2.65	1.30	9.00	0.00
		21-31	76.42	75.91	424.90	404.30	-20.59	14.01	0.27	0.00	0.00	14.28	76.17	38.89	69.00	2.57	3.55	20.50	0.00
	May	1-10	75.91	75.55	404.30	392.50	-11.80	10.78	0.12	0.00	0.00	10.98	75.73	38.05	66.80	2.54	0.00	13.43	1.63
		11-20	75.55	70.29	392.50	235.80	-156.70	13.95	0.36	0.00	124.97	136.28	72.92	32.16	66.30	2.13	15.29	158.70	0.00
		21-30	70.29	69.66	235.80	135.00	-100.80	11.99	0.40	0.00	106.14	118.53	67.97	22.23	68.10	1.47	0.00	119.99	19.42

TABLE 3-1: Reservoir Operation 1987 to 2003

Year	Month	Period date	Basin roof level at beginning of period	Basin roof level at end of period	Basin roof capacity at beginning	Basin roof capacity at end	Basin roof capacity difference Col. 7 - Col. 6	Water Released through RBHR	Water Released through BPO	Spillway Capacity through (M.C.M.)	Total releases (M.C.M.)	Average reservoir level during period (m) (Col. 14)	Average reservoir area corresponding to Ave. level	Evaporation losses from 15x18/1000	Other losses	Total Outflow	Inflow		
1987	June	1-10	85.65	84.83	135.00	118.60	-16.40	13.08	0.36	0.00	13.45	85.24	17.07	59.70	1.02	1.93	16.40	0.00	
		11-20	84.83	85.57	118.60	113.40	-5.20	1.47	0.07	0.00	198.30	85.84	16.99	15.20	0.26	0.00	200.10	194.80	
		21-31	85.57	86.30	113.40	131.00	17.60	0.00	0.00	0.00	461.92	86.94	20.16	3.90	0.08	0.00	461.60	528.20	
	July	1-10	86.30	87.28	191.00	196.40	5.40	0.00	0.00	0.00	369.91	87.79	21.69	6.20	0.18	0.00	369.99	348.39	
		11-20	87.28	87.77	196.40	303.10	106.70	0.00	0.00	0.00	1284.73	70.03	28.27	3.30	0.08	0.00	1284.82	1418.62	
		21-31	87.77	73.18	303.10	314.80	11.70	0.00	0.00	0.00	639.80	72.97	32.30	5.70	0.18	0.00	639.88	651.88	
	Aug	1-10	73.18	74.10	314.80	345.00	30.20	0.00	0.00	0.00	138.50	73.63	33.85	6.60	0.22	0.00	138.72	168.92	
		11-20	74.10	74.03	345.00	342.90	-2.10	0.00	0.00	0.00	339.46	74.07	34.53	6.80	0.23	0.00	339.71	337.61	
		21-30	74.03	74.54	342.90	358.20	15.30	0.00	0.00	0.00	801.92	74.29	34.93	3.30	0.12	0.00	802.04	818.94	
	Sept	1-10	74.54	75.94	358.20	444.60	86.40	0.00	0.00	0.00	592.28	75.74	38.13	4.50	0.17	0.00	593.45	678.85	
		11-20	75.94	76.78	444.60	523.20	78.60	0.00	0.00	0.00	130.02	77.06	43.27	18.40	0.80	0.00	130.62	209.42	
		21-31	76.78	79.48	523.20	548.00	24.80	0.00	0.00	0.00	23.27	79.12	48.42	38.30	1.78	0.00	29.05	53.85	
1988	Oct	1-10	79.48	79.69	548.00	558.50	10.50	1.13	0.16	0.00	1.29	79.66	47.44	46.20	2.19	0.00	3.48	14.88	
		11-20	79.69	78.74	558.50	581.80	23.30	2.10	0.07	0.00	0.00	79.72	47.79	47.79	16.10	0.77	0.00	5.55	9.08
		21-30	78.74	79.80	581.80	689.60	107.80	8.69	0.22	0.00	0.00	79.87	47.79	52.00	2.49	0.00	11.39	9.29	
	Nov	1-10	79.80	78.59	689.60	554.50	-135.10	4.90	0.12	0.00	0.00	5.01	70.80	47.60	54.10	2.56	0.00	7.59	2.59
		11-20	78.59	78.41	554.50	545.50	-9.00	11.87	0.20	0.00	0.00	12.08	70.80	47.25	53.70	2.54	0.00	14.61	5.61
		21-31	78.41	76.24	545.50	638.50	93.00	8.20	0.29	0.00	0.00	8.49	70.33	46.81	43.90	2.05	0.00	10.55	3.55
	Dec	1-10	76.24	79.00	638.50	531.00	-107.50	7.47	0.15	0.00	0.00	7.61	70.16	46.37	47.50	2.21	0.00	8.82	2.22
		11-20	79.00	78.91	531.00	624.40	93.40	6.77	0.17	0.00	0.00	5.95	70.49	45.95	45.00	2.07	0.00	8.01	0.00
		21-31	78.91	79.74	624.40	517.60	-106.80	6.78	0.17	0.00	0.00	5.93	70.49	45.95	55.30	2.52	0.00	8.45	1.64
	Jan	1-10	79.74	78.47	517.60	606.80	89.20	9.73	0.29	0.00	0.00	10.02	70.11	45.01	36.60	1.65	0.00	11.87	0.87
		11-20	78.47	78.35	606.80	802.00	195.20	4.77	0.06	0.00	0.00	4.83	70.41	44.53	44.00	1.96	0.00	6.79	1.99
		21-28	78.35	78.05	802.00	403.00	-399.00	8.18	0.26	0.00	0.00	9.44	70.71	44.00	49.40	2.17	0.00	11.61	0.00
Feb	1-10	78.05	77.94	403.00	405.60	2.60	4.20	0.06	0.00	0.00	4.26	70.50	43.48	53.70	2.34	0.00	8.59	2.19	
	11-20	77.94	77.79	405.60	478.80	73.20	4.69	0.12	0.00	0.00	4.71	70.58	43.15	52.20	2.25	0.00	8.65	0.16	
	21-31	77.78	77.44	478.80	464.20	-14.60	8.78	0.20	0.00	0.00	9.99	70.51	42.82	43.20	1.84	0.00	11.83	0.00	
March	1-10	77.44	77.25	464.20	467.00	2.80	6.06	0.08	0.00	0.00	6.14	70.35	41.86	46.80	2.08	0.00	8.22	1.02	
	11-20	77.25	76.87	467.00	441.50	-25.50	12.73	0.23	0.00	0.00	12.96	70.69	41.15	58.00	2.30	0.00	15.26	0.00	
	21-30	76.87	76.74	441.50	436.20	-5.30	2.75	0.00	0.00	0.00	2.75	70.61	40.61	60.90	2.47	0.00	5.32	0.00	
April	1-10	76.74	76.37	436.20	422.80	-13.40	10.01	0.23	0.00	0.00	10.24	70.56	39.82	59.80	2.39	0.00	12.62	0.00	
	11-20	76.37	75.94	422.80	405.20	-17.60	13.71	0.20	0.37	0.00	14.27	70.16	39.83	55.00	2.14	0.00	10.41	0.00	
	21-31	75.94	75.47	405.20	389.80	-15.40	12.56	0.08	0.61	0.00	13.28	75.71	37.58	58.00	2.13	0.00	15.41	0.00	
May	1-10	75.47	74.89	389.80	373.70	-16.10	13.29	0.29	0.22	0.00	14.16	75.23	38.83	60.20	2.22	0.00	16.41	0.00	
	11-20	74.89	74.99	373.70	150.90	-222.80	14.19	0.23	0.32	0.00	213.75	70.72	27.81	53.80	1.50	0.00	229.89	6.99	
	21-30	74.99	65.13	150.90	125.60	-25.30	16.33	0.00	1.73	5.07	23.93	65.79	18.07	61.50	1.11	0.00	25.04	0.00	

TABLE 3-4: Reservoir Operation 1987 to 2003

Year	Month	Period date	Reservoir level		Reservoir capacity at beginning of period	Reservoir capacity at end of period	Fitter's capacity difference Col. 7 - Col. 6	Water Released through			Spillway quantity through (McM)	Total releases (McM)	Average reservoir level during period (m)	Average reservoir area corresponding to Avg. level	Evaporation on depth in mm.	Evaporation losses Mcm 15x16/1000	Other losses	Total Outflow	In flow
			at beginning of period	at end of period				RBHR	CBHR	GRD									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1986	June	1-10	65.13	64.07	125.60	105.40	-19.20	13.12	0.00	0.00	0.00	13.12	64.60	15.97	62.40	1.00	0.00	14.12	0.00
		11-20	64.07	63.59	108.40	97.90	-8.60	8.40	0.00	0.00	0.00	8.40	63.80	14.97	50.20	0.74	0.00	9.13	0.53
		21-31	63.59	62.72	97.90	93.20	-14.60	8.72	0.05	0.00	0.00	8.77	63.15	13.72	46.50	0.84	0.00	10.40	0.00
	July	1-10	62.72	62.65	83.20	72.50	-10.70	10.16	0.17	0.00	0.00	10.32	62.39	12.57	35.90	0.45	0.00	10.78	0.09
		11-20	62.65	60.65	72.50	199.50	126.00	2.39	0.00	0.00	0.00	135.69	65.36	17.69	6.30	0.11	0.00	136.19	262.19
		21-31	60.65	60.85	199.50	298.00	98.50	0.00	0.00	0.00	437.35	437.35	70.63	27.19	7.40	0.20	0.00	437.55	537.05
	Aug	1-10	72.80	73.00	298.00	310.00	12.00	0.00	0.00	0.00	227.92	227.92	72.80	32.00	11.80	0.38	0.00	229.20	240.20
		11-20	73.00	74.50	310.00	351.90	41.00	0.00	0.00	0.00	14.85	14.85	73.95	33.70	26.90	0.99	0.00	15.75	56.75
		21-30	74.50	76.90	351.90	439.00	87.00	2.20	0.00	0.00	0.00	2.20	75.55	37.75	22.00	0.83	0.00	3.63	90.03
	Sept.	1-10	76.90	77.25	439.00	457.00	18.00	0.00	0.00	0.00	311.57	311.57	77.03	41.07	40.80	1.68	0.00	313.25	332.24
		11-20	77.25	76.50	457.00	508.00	51.00	2.20	0.03	0.09	52.79	55.02	77.88	48.18	35.20	1.52	0.00	56.54	107.54
		21-31	76.50	78.50	508.00	518.00	10.00	11.50	0.17	0.00	6.15	17.92	78.63	45.07	23.40	1.05	0.00	19.98	28.88
1988	Oct.	1-10	78.50	79.15	518.00	635.00	117.00	3.42	0.00	0.00	0.00	3.42	78.95	45.88	39.80	1.53	0.00	5.25	22.37
		11-20	79.15	79.35	635.00	543.00	-92.00	13.24	0.24	0.00	0.00	13.48	79.26	46.83	36.50	1.70	0.00	15.18	23.18
		21-30	79.35	79.55	543.00	652.90	109.90	0.00	0.29	0.00	0.00	0.29	79.45	47.09	50.70	2.39	0.00	2.88	11.89
	Nov.	1-10	79.55	79.15	652.90	533.00	-119.90	15.84	0.15	0.00	0.00	15.98	79.33	46.82	35.70	1.67	0.00	1.67	19.32
		11-20	79.15	78.95	533.00	526.00	-7.00	9.42	0.22	0.00	0.00	9.64	79.03	46.07	39.10	1.80	0.00	11.45	4.37
		21-31	78.95	78.75	526.00	518.00	-8.00	8.82	0.33	0.00	0.00	9.16	78.85	45.63	35.90	1.84	0.00	10.79	2.99
	Dec.	1-10	78.75	78.45	518.00	506.00	-12.00	14.32	0.03	0.00	0.00	14.35	78.60	45.01	38.20	1.63	0.00	15.98	4.28
		11-20	78.45	78.45	506.00	506.00	0.00	0.56	0.32	0.00	0.00	0.88	78.45	44.63	39.30	1.75	0.00	2.64	2.35
		21-31	78.45	79.95	506.00	495.00	-11.00	15.07	0.09	0.00	0.00	15.16	79.20	44.01	41.20	1.81	2.79	19.77	0.00
	Jan.	1-10	79.95	77.80	495.00	460.00	-35.00	6.24	0.15	0.00	0.00	6.39	78.09	43.19	37.60	1.62	0.00	8.01	1.95
		11-20	77.80	77.60	460.00	470.00	10.00	8.36	0.32	0.00	0.00	8.68	77.70	42.75	37.50	1.60	1.89	10.17	0.00
		21-28	77.60	77.80	470.00	453.00	-17.00	17.43	0.00	0.00	0.00	17.13	77.38	41.94	43.20	1.81	0.00	16.94	2.28
	Feb.	1-10	77.15	77.05	453.00	448.00	-5.00	3.18	0.46	0.00	0.00	3.64	77.10	41.26	41.30	1.70	0.00	5.34	0.88
		11-20	77.05	76.95	448.00	410.50	-37.50	5.00	0.26	0.00	0.00	5.26	76.95	40.86	45.70	1.87	0.49	8.62	0.00
		21-31	76.95	76.35	410.50	422.00	11.50	15.76	0.12	0.00	0.00	15.88	76.50	40.01	40.80	1.83	0.85	19.36	0.00
	March	1-10	76.35	76.20	422.00	416.00	-6.00	7.24	0.00	0.00	0.00	7.24	76.28	39.19	54.80	2.15	0.00	9.39	3.51
		11-20	76.20	75.95	416.00	405.00	-11.00	7.34	0.29	0.00	0.00	7.63	76.08	38.75	52.30	2.00	1.13	10.76	0.00
		21-30	75.95	75.25	405.00	382.00	-23.00	20.32	0.23	0.00	0.00	20.55	75.60	37.75	66.20	2.50	0.40	23.45	0.00
	April	1-10	75.25	74.95	382.00	369.00	-13.00	14.91	0.00	0.00	0.00	14.91	75.05	36.55	64.60	2.36	0.00	17.17	4.40
		11-20	74.95	74.55	369.00	369.50	0.50	5.14	0.17	0.00	0.00	5.31	74.76	35.77	57.80	2.07	2.30	8.67	0.00
		21-31	74.55	73.90	369.50	339.00	-30.50	16.36	0.20	0.00	0.00	16.56	74.23	34.82	61.90	2.16	0.02	21.53	0.00
	May	1-10	73.90	73.50	339.00	325.00	-14.00	11.75	0.00	0.00	0.00	11.75	73.76	33.80	64.10	2.17	0.00	13.91	1.11
		11-20	73.50	73.30	325.00	319.00	-6.00	8.38	0.00	0.00	0.00	8.38	73.40	33.20	61.30	2.04	0.00	7.42	1.42
		21-30	73.30	72.65	319.00	299.50	-19.50	19.32	0.32	0.00	0.00	19.64	72.93	32.34	67.20	2.17	0.00	21.82	2.33

TABLE 3-1: Reservoir Operation 1987 to 2003

Year	Month	Period date	Reservoir level		Reservoir capacity at beginning	Reservoir capacity at end of period	Reservoir capacity difference Col. 7 - Col. 6	Water Released through			Total releases (M.Cum.)	Average reservoir level during period (m) (Col. 4) x	Average reservoir area corresponding to Ave. level	Evaporation on depth in mm.	Evaporation losses Mm <sup>3</sup> /1000	Other losses	Total Outflow	Inflow
			at beginning of period	at end of period				RHR	LAHR	BPO								
1986	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	June	1-10	72.65	72.15	288.50	285.50	17.96	0.01	0.00	0.00	15.80	72.40	31.20	82.20	1.94	2.35	22.89	8.85
		11-20	72.15	68.75	285.50	222.00	10.85	0.17	0.00	107.81	118.82	70.95	28.27	24.70	0.70	0.03	119.55	36.06
		21-31	68.75	66.15	222.00	144.50	7.83	0.00	0.00	127.25	135.03	67.95	21.77	26.20	0.67	0.02	135.67	68.17
	July	1-10	66.15	65.30	144.50	140.00	8.78	0.11	0.00	32.60	42.70	66.00	18.40	26.00	0.49	0.01	43.18	38.68
		11-20	65.30	68.80	140.00	167.00	9.10	0.01	0.00	8.71	67.35	19.00	14.10	0.27	0.01	9.99	26.99	
	Aug	1-10	68.80	73.40	167.00	322.00	0.00	0.00	0.00	383.24	71.10	7.00	3.00	0.02	0.01	383.27	548.33	
		11-20	73.40	74.55	322.00	359.50	37.50	0.00	0.00	417.68	73.90	26.25	5.90	0.15	0.02	417.87	455.41	
	Sept.	1-10	74.55	74.50	359.50	358.00	0.00	0.00	0.00	287.62	74.53	34.30	3.00	0.27	0.01	287.80	266.40	
		11-20	74.50	78.76	358.00	435.00	0.00	0.00	0.00	367.56	75.60	35.38	11.10	0.39	0.01	367.98	444.59	
	Oct.	1-10	78.76	78.35	435.00	502.00	0.00	0.00	0.00	383.84	77.53	37.80	14.50	0.55	0.02	384.41	457.47	
		11-20	78.35	78.86	502.00	514.00	12.00	0.00	0.00	189.67	78.50	42.31	21.70	0.92	0.02	189.61	201.66	
1987	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Nov.	1-10	78.76	78.50	514.00	590.00	0.00	0.00	0.00	0.00	74.78	78.60	46.44	27.30	1.27	0.02	75.07	66.09
		11-20	78.50	79.55	590.00	552.00	0.00	0.00	0.00	1.00	78.60	47.50	43.90	2.09	0.02	3.11	13.11	
		21-31	79.55	78.35	552.00	522.00	0.00	0.00	0.00	142.60	78.83	47.50	49.90	2.35	0.02	144.87	137.46	
	Dec.	1-10	78.35	78.10	522.00	522.00	0.00	0.00	0.00	8.08	78.28	44.13	38.20	0.54	0.02	13.07	4.31	
		11-20	78.10	78.45	522.00	512.00	10.00	0.00	0.00	13.64	78.78	46.58	32.70	1.52	0.02	16.51	7.49	
	Jan.	1-10	78.45	78.60	512.00	500.00	0.00	0.00	0.00	9.87	78.53	45.94	37.70	1.73	0.02	14.22	4.20	
		11-20	78.60	77.75	500.00	488.00	12.42	0.25	0.00	12.68	78.45	45.00	35.20	1.59	0.02	16.30	4.30	
	Feb.	1-10	77.75	77.45	488.00	477.00	6.68	0.54	0.00	7.17	77.68	43.67	48.30	2.12	0.02	15.89	4.86	
		11-20	77.45	77.80	477.00	470.00	4.11	0.33	0.00	4.11	77.63	43.19	40.20	1.74	0.02	10.23	3.21	
	March	1-10	77.80	77.45	470.00	464.50	7.27	0.10	0.00	7.38	77.53	42.69	47.00	2.01	0.02	11.65	6.67	
		11-20	77.45	77.20	464.50	455.00	8.53	0.19	0.00	10.02	77.33	42.31	43.00	1.82	0.02	14.06	4.54	
April	1-10	77.20	76.75	455.00	436.50	16.59	0.24	0.00	15.83	76.98	41.81	52.00	2.17	0.02	22.75	4.21		
	11-20	76.75	77.65	436.50	433.50	3.00	0.24	0.00	2.44	77.20	40.94	50.00	2.05	0.02	1.10	6.59		
May	1-10	77.65	75.30	433.50	420.00	13.10	0.12	0.00	13.22	76.98	40.25	52.00	2.08	0.02	1.18	2.95		
	11-20	75.30	75.75	420.00	386.50	18.38	0.40	0.00	18.85	75.03	38.58	50.70	2.01	0.02	2.80	23.76		
May	1-10	75.75	76.35	386.50	372.50	8.45	0.20	0.00	8.64	75.55	38.07	60.00	2.32	0.02	4.25	15.21		
	11-20	76.35	74.95	372.50	364.00	15.74	0.44	0.00	16.18	75.15	37.65	55.70	2.10	0.02	16.30	5.25		
May	1-10	74.95	74.20	364.00	349.00	18.35	0.48	0.00	18.84	74.68	35.55	57.90	2.06	0.02	4.13	26.03		
	11-20	74.20	85.85	349.00	141.00	12.80	0.40	0.00	288.79	70.08	29.55	54.70	1.45	0.02	281.19	54.19		
21-30	85.85	85.85	141.00	138.60	1.94	0.51	0.00	5.10	65.89	18.18	68.50	1.28	0.02	6.39	3.92			



TABLE 3-1: Reservoir Operation 1987 to 2003

TABLE 3-1: Reservoir Operation 1987 to 2003																						
Year	Month	Period date	Reservoir level		Reservoir capacity		Reservoir capacity difference Col. 7 - Col. 6	Water Released through			Spillway quantity through (M.Cum.)	Total releases (M.Cum.)	Average reservoir level during period (m) (Col. 4+8)	Average reservoir area corresponding to Ave. level	Evaporation on depth in mm	Evaporation losses 15x10 /1000	Other losses	Total Outflow	In flow			
			at beginning of period	at end of period	at beginning	at end		RAHR	LBHR	BPO												
1987	June	1-10	85.83	86.25	128.60	128.00	-10.60	10.40	0.49	0.00	0.00	10.89	66.84	17.58	40.90	0.72	0.03	11.64	2.02			
		11-20	85.25	84.82	128.00	118.00	-10.00	11.92	0.39	0.00	0.00	12.31	65.03	16.70	28.00	0.47	0.01	12.79	5.16			
		21-30	84.8	84.15	118.00	144.50	26.50	0.69	0.00	0.00	25.58	26.42	65.48	17.46	13.10	0.23	0.00	26.85	53.15			
	July	1-10	86.35	86.40	144.50	160.60	5.50	0.00	0.42	0.00	82.28	88.70	69.28	18.91	17.10	0.32	0.01	89.03	84.75			
		11-20	86.4	85.95	160.00	141.00	-9.00	9.75	0.27	0.00	51.93	58.96	68.16	18.75	16.90	0.32	0.01	59.28	50.29			
		21-31	85.95	73.10	141.00	313.00	172.00	8.32	0.31	0.00	512.83	521.48	69.53	25.45	12.40	0.32	0.00	621.78	693.78			
	Aug	1-10	73.1	73.10	283.00	283.00	-20.00	0.00	0.00	0.00	578.61	578.61	73.10	31.90	11.20	0.36	0.00	578.97	558.98			
		11-20	73.1	75.85	283.00	395.00	102.00	1.70	0.37	0.00	68.16	70.23	74.53	34.85	15.10	0.53	0.01	70.77	173.28			
		21-30	75.95	75.85	395.00	492.00	7.00	1.42	0.27	0.00	767.52	769.21	75.90	38.40	12.60	0.48	0.01	769.70	776.22			
	Sept	1-10	75.85	74.30	402.00	371.00	-31.00	0.78	0.00	0.00	421.43	422.16	75.38	37.25	24.70	0.92	0.02	423.10	92.00			
		11-20	74.9	75.75	371.00	398.50	27.50	1.16	0.41	0.00	1.59	75.33	75.33	37.15	24.10	0.90	0.02	2.50	30.00			
		21-30	75.75	77.75	398.50	477.00	78.50	0.41	0.28	0.00	0.00	0.68	76.75	40.48	22.20	0.90	0.02	1.60	80.10			
Oct	1-10	77.75	78.45	477.00	506.00	29.00	1.29	0.00	0.00	0.00	1.29	78.10	43.74	38.70	1.98	0.07	3.05	32.00				
	11-20	78.45	78.70	506.00	516.00	10.00	2.17	0.22	0.00	0.00	2.39	78.58	44.93	34.30	1.54	0.05	3.98	12.49				
	21-31	78.7	76.70	516.00	516.00	0.00	9.94	0.37	0.00	0.00	9.31	78.70	45.25	46.90	2.11	0.10	11.52	9.42				
Nov	1-10	78.7	78.78	516.00	518.00	2.00	3.63	0.13	0.00	0.00	3.86	78.74	45.31	41.60	1.88	0.06	5.93	8.49				
	11-20	78.78	78.50	518.00	508.00	-10.00	15.71	0.49	0.00	0.00	16.20	78.64	46.05	33.90	1.82	0.05	17.77	9.53				
	21-30	78.5	78.50	508.00	508.00	0.00	3.41	0.88	0.00	0.00	3.50	78.50	44.75	29.10	1.30	0.04	4.84	7.45				
Dec	1-10	78.5	78.30	508.00	500.00	-8.00	11.54	0.00	0.00	0.00	11.54	78.40	44.50	28.40	1.25	0.04	12.84	6.37				
	11-20	78.3	78.00	500.00	488.00	-12.00	12.76	0.00	0.00	0.00	12.76	76.15	43.87	28.30	1.24	0.04	14.03	4.17				
	21-30	78	77.90	488.00	484.00	-4.00	2.76	0.00	0.00	0.00	2.76	77.95	73.87	30.30	2.24	0.07	5.07	1.88				
Jan	1-10	77.9	77.45	484.00	484.00	-18.50	18.78	0.17	0.00	0.00	18.56	77.60	42.88	36.80	1.57	0.05	17.59	1.76				
	11-20	77.45	77.40	484.00	483.00	-1.50	3.86	0.10	0.00	0.00	3.95	77.43	42.08	34.50	1.45	0.05	5.45	3.29				
	21-31	77.4	76.90	483.00	443.00	-40.00	16.29	0.00	0.00	0.00	16.29	77.15	41.37	41.10	1.70	0.07	19.06	3.20				
Feb	1-10	76.9	76.65	443.00	433.50	-9.50	7.78	0.27	0.00	0.00	8.04	76.78	40.43	31.20	2.07	0.11	10.22	5.09				
	11-20	76.65	76.45	433.50	428.00	-5.50	6.21	0.34	0.00	0.00	6.55	76.55	39.87	47.60	1.80	0.09	8.54	1.54				
	21-30	76.45	76.10	428.00	412.00	-16.00	9.75	0.00	0.00	0.00	9.75	76.78	39.21	38.20	1.50	0.08	11.30	0.82				
March	1-10	76.1	75.70	412.00	387.00	-25.00	11.63	0.21	0.00	0.00	12.04	75.90	38.40	66.70	2.25	0.13	14.43	3.81				
	11-20	75.7	75.25	387.00	382.00	-5.00	18.95	0.12	0.00	0.00	16.07	75.48	37.50	80.90	2.28	0.14	16.50	4.88				
	21-30	75.25	74.80	382.00	367.00	-15.00	11.15	0.36	0.00	0.00	11.52	75.03	36.50	81.50	2.97	0.24	14.74	3.60				
April	1-10	74.8	74.45	367.00	357.00	-10.00	9.83	0.00	0.00	0.00	9.83	74.83	35.63	76.90	2.74	0.21	12.59	4.65				
	11-20	74.45	73.75	357.00	332.00	-25.00	18.21	0.12	0.00	0.00	18.34	74.10	34.58	65.80	2.26	0.15	20.76	3.81				
	21-31	73.75	73.25	332.00	317.50	-14.50	15.28	0.49	0.00	0.00	15.75	73.90	33.40	64.80	2.18	0.14	18.04	4.38				
May	1-10	73.25	72.90	317.50	307.00	-10.50	9.94	0.10	0.00	0.00	9.84	73.08	32.52	69.90	2.27	0.18	12.07	3.21				
	11-20	72.90	72.20	307.00	287.00	-20.00	18.35	0.37	0.00	0.00	18.72	72.55	31.42	69.80	2.19	0.15	21.07	4.55				
	21-30	72.20	71.45	287.00	265.00	-22.00	17.78	0.54	0.00	0.00	18.30	71.83	30.00	78.50	2.38	0.18	20.84	3.70				

TABLE 3-1: Reservoir Operation 1987 to 2003

Year	Month	Period date	Reservoir level at beginning of period	Reservoir level at end of period	Reservoir capacity at beginning	Reservoir capacity at end	Reservoir capacity difference Cal. 7 - Cal. 8	Water Released through RHR	Water Released through EPO	Appl. Quantity through (M.Cm.)	Total releases (M.Cm.)	Average reservoir level during period (ft) (Cal. 4+6)	Average reservoir area corresponding to Ave. level	Reservoir depth on depth in mm.	Evaporation losses mm <sup>3</sup> Cal. 15x16 / 1000	Other losses	Total Outflow	In flow
1988	June	1-10	71.45	71.05	286.00	255.00	-31.00	11.59	0.49	0.00	12.08	71.25	28,920	54.50	1.59	0.03	14.05	5.90
		11-20	71.05	67.40	255.00	172.00	-83.00	7.03	0.30	0.00	12.89	69.23	24,720	40.00	0.99	0.04	126.92	43.89
		21-30	67.40	65.95	172.00	141.00	-31.00	7.37	0.49	0.00	8.98	66.68	19,600	38.10	0.75	0.03	88.75	38.73
	July	1-10	65.95	66.75	141.00	156.50	15.50	0.69	0.10	0.00	26.13	66.35	19,000	11.10	0.21	0.00	262.13	277.64
		11-20	66.75	66.50	156.50	152.00	-4.50	2.20	0.49	0.00	107.33	66.63	19,500	20.50	0.40	0.01	167.74	163.15
		21-31	66.50	66.80	152.00	202.00	50.00	13.22	0.54	0.00	17.94	67.05	21,450	14.00	0.30	0.00	10.24	68.25
	Aug	1-10	66.80	74.50	202.00	338.00	136.00	0.00	0.47	0.00	68.30	71.85	29,470	11.80	0.35	0.00	57.12	213.14
		11-20	74.50	75.05	338.00	402.00	64.00	1.50	0.00	0.00	162.77	75.18	36,820	20.70	0.76	0.02	163.55	207.55
		21-30	75.05	76.10	402.00	492.00	90.00	9.47	0.00	0.00	87.07	76.99	41,020	25.60	1.06	0.03	68.16	177.61
	Sept.	1-10	76.10	76.30	492.00	500.00	8.00	0.69	0.00	0.00	303.35	76.20	44,000	19.10	0.84	0.02	308.21	314.21
		11-20	76.30	76.40	500.00	504.00	4.00	0.60	0.00	0.00	888.58	76.35	44,370	17.10	0.76	0.01	880.35	884.36
		21-30	76.40	76.30	504.00	541.00	37.00	0.60	0.00	0.00	108.25	76.85	46,820	30.90	1.41	0.04	109.70	146.68
1989	Oct.	1-10	76.30	76.05	541.00	566.00	25.00	0.60	0.00	0.00	87.14	76.59	47,460	37.20	1.77	0.07	88.37	113.92
		11-20	76.05	76.05	566.00	582.50	16.50	0.00	0.00	0.00	104.04	76.70	47,770	38.90	1.65	0.07	105.87	92.42
		21-31	76.05	76.09	582.50	588.00	5.50	0.00	0.00	0.00	0.00	79.73	47,870	35.10	1.73	0.06	1.79	17.96
	Nov.	1-10	76.09	76.65	588.00	588.00	0.00	0.00	0.00	0.00	28.11	76.68	48,270	34.10	1.65	0.06	29.81	27.78
		11-20	76.65	76.70	588.00	590.00	2.00	2.94	0.00	0.00	13.22	76.78	47,980	37.00	1.77	0.07	18.00	13.66
		21-30	76.70	76.60	590.00	555.00	-35.00	6.71	0.32	0.00	7.04	76.85	47,620	46.00	2.19	0.10	9.33	7.89
	Dec.	1-10	76.60	76.63	555.00	532.50	-22.50	2.75	0.49	0.00	3.24	76.67	47,430	44.10	2.09	0.09	5.43	2.86
		11-20	76.63	76.10	532.50	533.00	0.50	14.97	0.20	0.00	15.16	76.32	46,810	61.30	2.87	0.19	18.21	5.43
		21-30	76.10	76.85	533.00	522.00	-11.00	8.14	0.51	0.00	8.64	76.99	45,930	39.80	1.83	0.07	10.54	3.98
	Jan.	1-10	76.85	76.60	522.00	512.00	-10.00	6.34	0.49	0.00	6.83	76.73	45,310	40.30	1.83	0.07	8.73	1.88
		11-20	76.60	76.20	512.00	498.00	-14.00	16.16	0.49	0.00	16.64	76.40	44,500	45.90	2.04	0.09	18.78	3.71
		21-31	76.20	76.10	498.00	492.00	-6.00	1.14	0.70	0.00	1.84	76.16	43,870	52.00	2.28	0.12	4.24	2.47
	Feb.	1-10	76.10	77.65	492.00	472.50	-19.50	15.35	0.49	0.00	15.84	77.68	43,160	52.00	2.25	0.12	16.20	5.03
		11-20	77.65	77.20	472.50	455.00	-17.50	17.27	0.23	0.00	17.51	77.43	42,060	57.60	2.42	0.14	20.07	2.92
		21-30	77.20	77.10	455.00	451.00	-4.00	0.92	0.00	0.00	0.82	77.15	41,370	58.00	2.44	0.14	3.50	2.57
	March	1-10	77.10	76.85	451.00	440.00	-11.00	16.31	0.03	0.00	6.34	76.98	40,930	77.00	3.15	0.24	9.74	2.23
		11-20	76.85	76.25	440.00	418.00	-22.00	18.94	0.49	0.00	19.33	76.55	39,870	75.70	3.02	0.23	22.56	3.91
		21-30	76.25	75.95	418.00	405.50	-12.50	8.91	0.44	0.00	9.35	76.10	39,810	60.70	0.03	0.00	7.38	2.66
	April	1-10	75.95	75.80	405.50	394.00	-11.50	7.34	0.08	0.00	7.42	75.78	38,150	79.60	3.04	0.24	10.70	2.02
		11-20	75.80	74.85	394.00	389.00	-5.00	19.42	0.49	0.00	19.91	75.23	36,950	93.60	3.46	0.32	23.89	4.22
		21-31	74.85	74.40	389.00	356.00	-33.00	14.78	0.49	0.00	14.77	74.53	35,930	79.60	2.94	0.23	17.83	5.80
	May	1-10	74.40	74.00	356.00	342.00	-14.00	8.59	0.49	0.00	9.07	74.20	34,800	87.30	3.04	0.27	12.37	2.17
		11-20	74.00	70.75	342.00	248.00	-94.00	18.06	0.49	0.00	95.11	71.56	31.06	85.00	2.54	0.22	118.05	28.14
		21-30	70.75	65.70	248.00	136.00	-112.00	14.80	0.64	0.00	123.92	68.23	22.81	79.60	1.82	0.14	141.21	32.47

TABLE 3-1: Reservoir Operation 1987 to 2003

Year	Month	Period date	Reservoir level at beginning of period	Reservoir level at end of period	Reservoir capacity at beginning	Reservoir capacity at end	Reservoir storage difference Col. 7 - Col. 6	Water Released through FBR/R	Water Released through LBHR	BPO	Spillway quantity through (M.C.Um.)	Total release (M.C.Um.)	Average reservoir level during period (m) (Col. 4 & 5)	Average reservoir area corresponding to level	Evaporation on depth in mm.	Evaporation losses Min <sup>3</sup> Col. 15 & 16 (1000)	Other losses	Total Outflow	In flow
1989	June	1-10 11-20 21-30	65.7 66.25 64.9	65.25 64.9 64.9	126.00 126.00 120.00	126.00 126.00 120.00	-0.00 -0.00 -0.00	5.55 11.74 0.21	0.20 0.30 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.55 12.04 145.95	55.48 65.08 65.50	17,470 16,770 17,500	78.53 30.00 28.70	1.37 0.52 0.52	0.11 0.02 0.02	7.32 12.67 145.50	0.95 6.96 170.50
	July	1-10 11-20 21-31	68.1 67.85 67.65	68.0 67.40 67.40	144.00 152.00 177.00	144.00 152.00 177.00	0.00 0.00 0.00	7.71 2.49 0.35	0.22 0.17 0.05	0.00 0.00 0.00	0.00 0.00 0.00	7.71 2.49 0.35	66.30 67.08 70.03	18,920 20,380 26,330	43.79 8.90 19.10	0.63 0.18 0.50	0.04 0.00 0.01	36.55 901.24 299.10	36.55 925.28 405.11
	Aug	1-10 11-20 21-31	72.4 72.4 72.4	72.4 72.4 72.4	293.00 345.00 307.00	293.00 345.00 307.00	0.00 0.00 0.00	1.32 0.00 0.00	0.26 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	1.32 0.00 0.00	73.25 78.50 73.59	32,800 33,370 33,520	12.90 28.70 31.65	0.42 0.89 1.06	0.01 0.02 0.03	237.13 221.95 1.00	289.13 183.95 43.58
	Sept.	1-10 11-20 21-30	74.25 74.25 74.25	74.25 74.25 74.25	349.00 380.00 472.50	349.00 380.00 472.50	0.00 0.00 0.00	1.90 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	1.90 0.00 0.00	74.79 76.43 76.38	35,900 39,760 44,430	23.80 26.10 30.20	0.65 1.04 1.34	0.02 0.03 0.04	2.66 1.06 1.36	33.18 93.60 61.88
	Oct.	1-10 11-20 21-31	78.1 78.1 78.1	78.1 78.1 78.1	533.00 552.00 552.00	533.00 552.00 552.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	78.43 78.85 79.73	47,050 47,680 47,930	30.80 36.90 52.30	1.45 1.76 2.51	0.04 0.03 0.13	163.73 123.95 16.37	215.71 114.41 31.78
	Nov.	1-10 11-20 21-30	78.9 78.9 78.9	78.9 78.9 78.9	555.00 555.00 555.00	555.00 555.00 555.00	0.00 0.00 0.00	2.26 1.33 7.33	0.00 0.42 0.28	0.00 0.00 0.00	0.00 0.00 0.00	2.26 1.33 7.33	79.75 78.65 79.65	47,930 47,820 47,820	49.20 50.30 46.40	2.36 2.40 2.35	0.12 0.12 0.12	26.53 4.27 10.08	13.43 9.17 7.29
	Dec.	1-10 11-20 21-30	78.6 78.6 78.6	78.6 78.6 78.6	555.00 555.00 555.00	555.00 555.00 555.00	0.00 0.00 0.00	11.13 7.28 8.28	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	11.13 7.28 8.28	79.38 78.03 78.93	46.93 46.06 45.66	46.20 48.10 51.00	2.17 2.22 2.32	0.10 0.11 0.12	13.40 9.60 10.70	2.22 9.64 6.29
2000	Jan.	1-10 11-20 21-31	78.5 78.5 78.5	78.5 78.5 78.5	518.00 518.00 490.00	518.00 518.00 490.00	0.00 0.00 0.00	13.94 14.09 13.68	0.00 0.00 0.01	0.00 0.00 0.00	0.00 0.00 0.00	13.94 14.09 13.68	78.62 78.26 77.88	45.06 44.18 43.18	48.20 46.40 50.30	2.17 2.05 2.43	0.10 0.10 0.14	15.22 18.24 18.25	8.13 1.46 5.07
	Feb.	1-10 11-20 21-30	77.7 77.7 77.7	77.7 77.7 77.7	457.00 457.00 457.00	457.00 457.00 457.00	0.00 0.00 0.00	16.68 3.06 13.49	0.17 0.24 0.22	0.00 0.00 0.00	0.00 0.00 0.00	16.68 3.06 13.49	77.99 77.73 77.00	42.19 41.55 41.09	48.80 54.40 56.00	2.06 2.26 2.35	0.10 0.12 0.14	16.36 5.66 16.23	2.39 5.06 1.41
	March	1-10 11-20 21-30	76.8 76.8 76.8	76.8 76.8 76.8	438.00 438.00 438.00	438.00 438.00 438.00	0.00 0.00 0.00	18.85 9.95 7.75	0.27 0.28 0.28	0.00 0.00 0.00	0.00 0.00 0.00	18.85 9.95 7.75	76.53 76.08 76.73	39.87 36.76 38.03	75.20 71.20 157.20	3.00 2.76 7.50	0.23 0.20 1.48	22.44 12.19 17.00	2.98 10.00 5.18
	April	1-10 11-20 21-31	75.5 75.5 75.5	75.5 75.5 75.5	392.50 374.00 327.00	392.50 374.00 327.00	0.00 0.00 0.00	19.11 20.80 18.91	0.37 0.02 0.08	0.00 0.00 0.00	0.00 0.00 0.00	19.11 20.80 18.91	75.28 74.83 73.93	37.03 36.65 34.25	81.80 84.60 78.70	3.03 3.02 2.70	0.25 0.26 0.21	21.76 24.10 21.90	4.24 4.39 3.69
	May	1-10 11-20 21-30	73.6 73.6 73.6	73.6 73.6 73.6	317.00 317.00 317.00	317.00 317.00 317.00	0.00 0.00 0.00	10.59 6.96 18.90	0.46 0.48 0.08	0.00 0.00 0.00	0.00 0.00 0.00	10.59 6.96 18.90	73.43 73.13 72.73	33.250 32.65 31.95	86.80 72.90 70.60	2.59 2.36 2.26	0.25 0.17 0.16	14.21 9.90 18.39	5.07 4.38 6.88

TABLE 3-1: Reservoir Operation 1987 to 2003

Year	Month	Period date	Reservoir level at beginning of period	Reservoir level at end of period	Reservoir capacity at beginning	Reservoir capacity at end	Reservoir capacity difference Col. 7 - Col. 6	Water Released through RBIR	Water Released through LBIR	Water Released through SRA	Spillway through (M.Cum.)	Total release (M.cum.)	Average reservoir level during period (m) (Col. 14)	Average reservoir area corresponding to Ave. level	Evaporation loss on depth in mm.	Evaporation loss on 15th 10/1000	Other losses	Total Outflow	Inflow
2000	June	1-10	72.55	72.45	287.00	284.80	-2.20	8.23	0.00	0.00	0.00	8.23	72.50	31.40	54.10	1.70	0.09	11.02	11.17
		11-20	72.45	72.00	294.80	280.00	-14.80	8.83	0.00	0.00	0.00	19.27	72.23	30.80	51.60	1.59	0.08	20.04	11.39
		21-30	72	68.00	290.00	142.00	-148.00	15.12	0.49	0.00	172.00	188.61	69.00	24.35	51.50	1.25	0.05	190.22	52.18
	July	1-10	68	67.40	142.00	172.00	30.30	2.21	0.31	0.00	143.69	148.43	68.70	19.85	10.80	0.21	0.00	146.65	176.62
		11-20	67.4	66.85	172.00	158.50	-13.50	0.00	0.00	0.00	735.71	736.71	67.13	20.40	12.80	0.26	0.00	735.08	724.84
		21-31	66.65	68.70	158.50	200.00	41.50	8.87	0.37	0.00	52.11	61.34	67.68	21.68	57.70	1.25	0.07	62.67	195.12
	Aug	1-10	68.7	70.40	200.00	238.00	38.00	12.96	0.40	0.00	0.00	13.42	69.55	25.17	31.10	0.78	0.02	14.23	52.22
		11-20	70.4	72.70	238.00	301.00	63.00	2.17	0.00	0.00	0.00	2.17	71.55	32.32	28.65	0.33	0.03	3.12	67.59
		21-30	72.7	75.80	301.00	400.00	98.90	1.83	0.00	0.00	272.12	273.75	74.25	37.97	18.80	0.71	0.01	274.46	375.20
	Sept	1-10	75.6	75.90	400.00	404.00	4.00	1.46	0.00	0.00	153.70	155.15	75.85	38.30	41.20	1.58	0.07	156.90	162.37
		11-20	75.9	76.50	404.00	426.00	24.00	6.92	0.16	0.00	0.00	7.10	76.20	39.07	47.90	1.87	0.09	9.06	33.58
		21-30	76.5	76.85	426.00	440.50	12.50	13.31	0.46	0.00	0.00	18.80	76.68	40.48	51.90	2.10	0.11	21.01	33.41
2001	Oct	1-10	76.85	77.00	440.50	447.00	6.50	13.81	0.46	0.00	0.00	14.30	77.09	40.81	48.90	1.98	0.10	10.98	22.80
		11-20	77	77.15	447.00	453.00	6.00	14.46	0.28	0.00	0.00	14.50	77.09	41.18	43.80	1.80	0.09	16.39	22.70
		21-31	77.15	77.15	453.00	453.00	0.00	1.14	0.00	0.00	0.00	1.14	77.15	41.37	64.90	2.68	0.17	4.00	6.68
	Nov	1-10	77.15	76.80	453.00	453.00	0.00	12.78	0.00	0.00	0.00	12.78	77.03	41.08	67.90	2.37	0.14	15.25	8.90
		11-20	76.8	76.80	453.00	428.00	-25.00	14.86	0.03	0.00	0.00	14.71	76.70	40.25	50.90	2.05	0.10	16.85	3.96
		21-30	76.5	76.10	428.00	412.00	-16.00	15.00	0.09	0.00	0.00	15.49	76.30	39.27	51.80	2.03	0.11	17.63	3.59
	Dec	1-10	76.1	75.80	412.00	400.00	-12.00	11.86	0.48	0.00	0.00	12.35	75.95	38.50	51.40	1.98	0.10	14.43	5.40
		11-20	75.8	75.40	400.00	387.00	-13.00	14.37	0.32	0.00	0.00	14.69	75.50	37.75	41.10	1.55	0.08	16.30	3.86
		21-30	75.4	74.85	387.00	368.00	-18.00	18.71	0.64	0.00	0.00	19.25	75.13	36.70	41.40	1.52	0.06	20.83	3.13
	Jan	1-10	74.85	74.40	368.00	358.00	-10.00	18.58	0.28	0.00	0.00	18.84	74.63	35.55	38.40	1.40	0.06	21.30	9.12
		11-20	74.4	74.20	358.00	346.00	-12.00	18.15	0.48	0.00	0.00	18.64	74.30	35.00	44.50	1.56	0.07	20.26	19.22
		21-31	74.2	73.85	346.00	338.00	-8.00	15.68	0.59	0.00	0.00	15.92	74.03	34.45	59.40	2.05	0.12	18.14	7.72
	Feb	1-10	73.85	73.20	338.00	316.00	-22.00	18.38	0.35	0.00	0.00	18.84	73.53	33.45	53.40	1.79	0.10	21.72	5.72
		11-20	73.2	72.60	316.00	298.00	-18.00	18.85	0.49	0.00	0.00	19.34	72.90	32.20	62.60	2.02	0.13	21.46	5.06
		21-30	72.6	72.75	298.00	285.50	-12.50	15.58	0.59	0.00	0.00	15.97	72.68	31.10	45.00	1.40	0.05	17.44	6.23
	March	1-10	72.15	71.55	285.50	268.50	-17.00	17.82	0.53	0.00	0.00	18.14	71.86	30.06	60.60	1.62	0.11	20.97	4.83
		11-20	71.55	71.20	268.50	255.00	-13.50	8.51	0.03	0.00	0.00	8.54	71.36	28.16	68.20	2.02	0.14	10.70	4.14
		21-30	71.2	70.30	255.00	235.00	-20.00	23.08	0.31	0.00	0.00	23.37	70.75	21.75	85.10	2.36	0.20	25.94	5.39
	April	1-10	70.3	69.65	235.00	218.00	-17.00	19.58	0.56	0.00	0.00	19.84	69.93	25.95	83.20	2.15	0.18	22.27	5.86
		11-20	69.65	68.80	218.00	202.00	-16.00	18.20	0.49	0.00	0.00	18.69	69.18	24.30	86.30	2.10	0.18	20.86	5.20
		21-31	68.8	67.65	202.00	181.00	-21.00	20.71	0.26	0.00	0.00	20.98	68.33	22.68	88.10	2.00	0.18	23.15	3.17
	May	1-10	67.65	67.05	181.00	163.60	-17.30	16.70	0.00	0.00	0.00	16.70	67.48	21.02	81.40	1.92	0.18	21.00	4.88
		11-20	67.05	65.90	163.60	140.00	-23.50	20.47	0.31	0.00	0.00	20.79	66.46	19.23	87.40	1.69	0.15	22.61	3.12
		21-30	65.90	65.30	140.00	128.00	-11.90	9.53	0.00	0.00	0.00	9.53	65.60	17.70	87.40	1.72	0.17	11.42	3.16

TABLE 3-4: Reservoir Operation 1987 to 2003

Year	Month	Period date	Reservoir level		Reservoir capacity at beginning of period	Reservoir capacity at end of period	Reservoir capacity difference Col. 7 - Col. 6	Water Released through		Spillways Capacity through (M.Cum.)	Total releases (M.cum)	Average reservoir level during period (m) (Col. 14)	Average reservoir area corresponding to Ave. level	Pregravel on depth in mm.	Evaporation (mm/15x15/1000)	Other losses	Total Outflow	In flow
			at beginning of period	at end of period				RBHR	LBHR									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2001	June	1-10	65.3	64.60	128.00	119.00	-11.00	16.57	0.48	0.00	17.06	65.05	16.77	71.70	1.20	0.99	18.35	9.37
		11-20	64.0	66.35	118.00	149.00	31.00	0.81	0.13	0.00	213.27	65.38	17.56	13.50	0.24	0.00	214.44	247.59
		21-30	69.35	66.25	149.00	146.50	-2.50	4.07	0.00	0.00	76.37	63.30	18.95	43.50	0.82	0.04	81.30	80.78
	July	1-10	66.35	67.35	146.00	149.00	2.50	3.98	0.41	0.00	303.91	66.80	13.80	8.60	0.19	0.00	308.51	313.30
		11-20	67.35	67.00	149.00	162.00	13.00	0.00	0.09	0.00	308.03	67.16	20.46	14.20	0.29	0.00	308.40	324.47
		21-31	67	72.80	162.00	207.00	145.00	0.65	0.03	0.00	101.42	69.95	25.87	19.70	0.51	0.01	102.62	260.50
	Aug	1-10	72.9	73.95	307.00	340.00	33.00	1.28	0.29	0.00	187.29	73.45	33.25	11.30	0.38	0.00	169.23	202.23
		11-20	73.95	73.45	340.00	324.50	-15.50	0.31	0.00	0.00	481.31	73.79	30.80	8.10	0.31	0.00	481.82	466.38
		21-30	73.45	75.60	324.50	394.00	69.50	3.17	0.00	0.00	0.00	74.53	35.39	35.90	1.27	0.05	4.49	87.69
	Sept.	1-10	75.6	75.55	394.00	430.00	36.00	0.00	0.00	0.00	13.23	75.58	38.75	30.80	1.19	0.04	14.46	37.21
		11-20	75.55	77.90	430.00	470.00	40.00	8.89	0.23	0.00	9.12	76.58	41.19	35.70	1.47	0.05	10.64	50.61
		21-31	77.8	78.45	470.00	500.00	30.00	10.21	0.48	0.00	10.70	76.03	43.55	40.80	1.79	0.07	12.58	48.50
	Oct.	1-10	78.45	79.40	500.00	545.00	45.00	1.45	0.42	0.00	0.00	76.93	45.80	28.50	1.31	0.04	3.21	42.19
		11-20	79.4	78.00	545.00	568.00	23.00	3.76	0.00	0.00	0.00	78.20	47.82	40.80	1.85	0.08	5.80	45.38
		21-30	79	78.65	568.00	597.00	-11.00	5.99	0.07	0.00	16.68	79.33	47.94	46.40	2.22	0.10	25.05	19.90
	Nov.	1-10	78.65	79.35	597.00	643.00	46.00	17.39	0.48	0.00	20.81	79.50	47.25	44.50	2.10	0.06	40.89	8.20
		11-20	79.35	79.35	643.00	643.00	0.00	5.64	0.18	0.00	5.80	79.35	49.07	41.80	1.96	0.08	7.84	8.43
		21-31	79.35	79.00	643.00	628.00	-15.00	16.97	0.49	0.00	0.00	79.18	48.44	44.80	2.08	0.08	19.64	5.97
	Dec.	1-10	79	78.60	628.00	512.00	-116.00	10.80	0.49	0.00	0.00	78.80	45.50	45.80	2.07	0.08	21.46	7.38
		11-20	78.6	76.30	512.00	500.00	-12.00	16.08	0.49	0.00	0.00	76.55	44.82	45.00	2.01	0.09	19.64	7.32
		21-30	78.3	77.35	500.00	482.00	-18.00	15.73	0.58	0.00	16.31	76.09	43.69	44.50	1.94	0.09	18.34	3.81
2002	Jan.	1-10	77.35	77.50	482.00	466.00	-16.00	13.01	0.61	0.00	13.62	77.69	42.69	40.80	1.75	0.07	15.44	0.54
		11-20	77.5	77.40	466.00	463.00	-3.00	2.84	0.81	0.00	3.55	77.45	42.12	45.70	1.92	0.08	5.86	2.65
		21-31	77.4	78.85	463.00	440.50	-22.50	20.19	0.97	0.00	20.85	76.63	41.30	49.50	2.04	0.10	23.00	0.81
	Feb.	1-10	78.85	76.25	440.50	416.00	-24.50	18.35	0.03	0.00	18.38	76.05	39.87	46.80	1.87	0.09	20.33	11.73
		11-20	76.25	76.75	416.00	388.50	-27.50	18.38	0.58	0.00	18.99	76.00	38.80	49.90	1.93	0.10	18.98	2.27
		21-30	75.75	75.35	388.50	353.50	-35.00	14.23	0.49	0.00	14.72	75.55	37.67	42.60	1.60	0.07	16.39	3.33
	March	1-10	75.35	74.85	353.50	369.00	15.50	18.89	0.09	0.00	16.97	76.10	36.55	61.80	2.27	0.14	16.38	2.90
		11-20	74.85	74.30	369.00	351.00	-18.00	17.59	0.58	0.00	18.17	74.59	35.46	60.20	2.13	0.13	20.44	5.70
		21-31	74.3	73.80	351.00	334.00	-17.00	16.55	0.33	0.00	18.88	74.05	34.50	77.70	2.88	0.21	19.77	5.17
	April	1-10	73.8	73.45	334.00	324.50	-9.50	6.52	0.47	0.00	8.99	73.83	33.65	87.80	2.28	0.15	11.42	2.53
		11-20	73.45	72.80	324.50	304.00	-20.50	21.94	0.40	0.00	22.24	73.13	33.65	80.60	2.71	0.22	25.17	6.40
		21-30	72.8	72.10	304.00	284.00	-20.00	21.53	0.16	0.00	21.71	72.45	31.30	99.00	3.10	0.31	25.12	6.40
	May	1-10	72.1	71.40	284.00	283.00	-1.00	18.28	0.16	0.00	18.47	71.75	28.82	94.00	2.60	0.26	21.50	5.26
		11-20	71.40	70.65	283.00	245.50	-17.50	19.83	0.49	0.00	20.42	71.03	28.45	97.80	2.78	0.27	23.48	6.01
		21-31	70.65	69.50	245.50	236.00	-19.50	21.47	0.12	0.00	21.59	70.28	26.65	94.20	2.51	0.24	24.33	5.95

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TABLE 3-1: Reservoir Operation 1987 to 2003

Year	Month	Period date	Reservoir level at beginning of period	Reservoir level at end of period	Reservoir capacity at beginning	Reservoir capacity at end	Reservoir capacity difference Col. 7 - Col. 6	Water Released through RBHR	Water Released through LBHR	Water Released through EPO	Outflow Quantity through (M.Cu.)	Total releases (M.Cu.)	Average reservoir level during period (m) (Col. 4+6)	Average reservoir area corresponding to Ave. level	Evaporation losses on depth in mm	Evaporation losses mm' Col. 15x17/1000	Other losses	Total Outflow	In flow
2002	June	1-10	68.9	68.25	228.00	215.50	-14.50	18.04	0.27	0.00	0.00	18.31	68.58	23.05	62.80	2.32	0.22	20.85	6.15
		11-20	69.25	68.60	211.50	197.00	-14.50	15.64	0.46	0.00	0.00	16.43	68.83	23.65	50.60	1.21	0.06	17.69	4.38
		21-30	69.6	69.05	197.00	207.00	10.00	0.34	0.03	0.00	602.09	602.47	69.63	23.65	7.80	0.19	0.00	602.65	612.68
	July	1-10	69.055	68.20	207.00	146.00	-61.00	0.93	0.00	0.00	219.66	220.31	67.53	21.44	39.20	0.84	0.03	221.18	180.17
		11-20	68.2	66.70	146.00	156.00	10.00	4.08	0.46	0.00	90.73	95.29	66.45	19.25	29.30	0.56	0.02	85.86	104.40
		21-31	66.7	73.95	156.00	340.00	184.00	6.92	0.54	0.00	0.00	7.46	70.33	26.75	30.20	0.81	0.02	8.29	23.35
	Aug	1-10	73.95	78.05	340.00	406.50	66.50	10.20	0.30	0.00	283.68	284.19	75.00	36.40	14.50	0.53	0.01	284.72	364.29
		11-20	78.05	75.10	406.50	377.00	-29.50	0.00	0.00	0.00	388.29	388.29	75.58	37.74	18.70	0.71	0.01	389.01	356.51
		21-30	75.1	76.00	377.00	438.00	61.00	4.18	0.00	0.00	238.97	243.15	75.95	38.50	28.40	1.02	0.03	244.20	305.20
	Sept.	1-10	76.8	78.00	438.00	436.00	-2.00	1.59	0.00	0.00	288.05	300.65	76.80	40.50	23.30	0.94	0.02	301.90	301.90
		11-20	77.80	77.80	436.00	460.00	24.00	4.88	0.10	0.00	0.00	4.98	77.30	41.75	36.60	1.53	0.06	8.56	48.53
		21-31	77.8	78.05	460.00	460.00	0.00	9.62	0.49	0.00	0.00	10.31	77.93	43.31	10.20	0.44	0.00	10.76	22.09
2003	Oct.	1-10	78.05	78.10	460.00	462.00	2.00	10.40	0.49	0.00	0.00	10.80	78.09	43.86	61.60	2.69	0.17	13.74	15.60
		11-20	78.1	77.90	462.00	490.00	28.00	17.91	0.49	0.00	0.00	18.40	77.95	48.55	68.80	3.34	0.23	21.97	9.76
		21-30	77.9	77.46	490.00	464.50	-25.50	18.18	0.38	0.00	0.00	19.54	77.63	52.56	83.10	3.32	0.21	23.07	0.88
	Nov.	1-10	77.46	77.05	464.50	448.00	-16.50	14.40	0.00	0.00	0.00	14.40	77.25	41.82	50.20	2.09	0.10	16.59	3.79
		11-20	77.05	75.75	448.00	435.50	-12.50	14.81	0.00	0.00	0.00	14.81	76.59	40.75	46.30	1.89	0.09	16.76	6.91
		21-31	75.75	75.60	435.50	432.00	-3.50	3.19	0.00	0.00	0.00	3.18	76.68	40.19	55.20	2.22	0.12	5.52	4.82
	Dec.	1-10	75.60	76.6	432.00	420.00	-12.00	11.37	0.00	0.00	0.00	11.84	76.70	39.82	58.40	2.31	0.14	14.29	4.38
		11-20	76.6	74.65	420.00	368.00	-52.00	2.72	0.13	0.00	0.00	2.86	74.78	35.94	46.20	1.66	0.08	4.59	3.23
		21-31	74.65	74.15	368.00	348.50	-19.50	18.32	0.00	0.00	0.00	18.32	74.43	36.24	68.50	1.88	0.11	20.42	4.81
	Jan.	1-10	74.15	73.65	348.50	329.00	-19.50	15.67	0.29	0.00	0.00	16.85	73.90	34.20	61.00	1.74	0.09	17.69	1.51
		11-20	73.65	73.15	329.00	314.50	-14.50	17.17	0.61	0.00	0.00	17.78	73.40	33.20	51.00	1.69	0.09	19.56	6.65
		21-30	73.15	72.85	314.50	299.50	-15.00	13.31	0.49	0.00	0.00	13.80	72.60	32.15	53.20	1.71	0.09	15.60	2.59
	Feb.	1-10	72.85	72.05	299.50	282.00	-17.50	18.44	0.41	0.00	0.00	18.85	72.35	31.07	76.80	2.38	0.18	18.42	3.07
		11-20	72.05	71.45	282.00	265.00	-17.00	13.61	0.46	0.00	0.00	14.08	71.75	28.82	72.50	2.16	0.16	16.38	4.65
		21-31	71.45	70.90	265.00	248.00	-17.00	19.47	0.67	0.00	0.00	18.14	71.13	28.65	91.60	2.62	0.24	22.01	7.69
	March	1-10	70.90	70.05	248.00	229.50	-18.50	18.59	0.81	0.00	0.00	20.19	70.43	29.96	60.00	2.64	0.23	23.06	4.62
		11-20	70.05	69.35	229.50	214.00	-15.50	17.82	0.61	0.00	0.00	18.43	69.70	25.30	83.20	2.38	0.22	21.01	5.85
		21-31	69.35	68.60	214.00	197.00	-17.00	16.07	0.00	0.00	0.00	16.16	69.88	23.96	84.60	2.03	0.17	19.35	4.65
	April	1-10	68.60	67.65	197.00	177.00	-20.00	21.19	0.40	0.00	0.00	21.82	68.13	22.31	94.60	1.89	0.16	23.98	3.75
		11-20	67.65	66.90	177.00	160.00	-17.00	15.21	0.16	0.00	0.00	15.39	67.28	20.65	94.40	1.55	0.18	17.52	2.09
		21-30	66.90	66.00	160.00	128.00	-32.00	16.69	0.06	0.00	0.00	16.78	66.45	18.26	98.40	1.91	0.19	18.86	2.55

TABLE 3-2: INFLOW SERIES OF DAMIAN GANGA

(ALL FIGURES IN MCM)

Month	Ten days	87-88	88-89	89-90	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03
June	I	0.00	0.00	0.00	0.00	113.87	0.41	0.21	0.00	0.00	8.85	2.02	5.60	0.96	11.17	9.97	6.15
	II	0.41	0.00	26.20	16.71	0.00	7.03	93.56	194.90	0.53	56.05	5.16	43.89	6.96	11.39	247.59	4.36
	III	6.36	0.00	0.00	17.40	22.29	61.63	84.38	529.20	0.00	58.17	53.15	38.73	170.50	52.18	80.79	612.68
July	I	420.43	0.00	47.11	266.32	75.45	14.89	203.46	348.39	0.08	38.68	94.75	277.64	38.53	178.62	313.30	160.17
	II	113.94	727.99	107.05	267.92	530.83	33.94	1200.34	1418.52	262.19	26.99	50.28	163.15	926.26	724.94	324.47	106.46
	III	88.01	770.99	562.39	299.02	1058.45	207.59	267.69	651.68	537.05	548.33	683.78	68.25	405.11	105.12	250.59	23.55
August	I	80.20	398.31	115.84	265.36	265.73	202.42	164.92	168.92	240.20	465.41	558.98	213.14	289.13	52.22	202.23	364.29
	II	225.27	147.03	224.63	777.94	272.90	973.08	103.30	337.61	56.75	266.40	173.28	207.55	183.95	67.59	466.38	356.51
	III	357.98	267.89	520.70	573.89	459.13	174.10	212.25	818.34	90.03	444.99	776.22	177.61	43.58	375.20	87.69	305.20
Sept.	I	78.06	198.08	123.38	182.88	109.88	690.28	226.62	678.95	332.24	451.47	92.08	314.21	33.18	162.37	37.21	301.60
	II	42.67	198.20	40.06	106.39	44.49	124.80	175.90	209.42	107.54	201.66	30.00	894.36	93.60	33.58	50.61	48.53
	III	25.21	243.19	160.61	339.54	24.29	25.96	710.90	53.85	28.86	47.50	80.10	146.68	61.66	33.41	48.50	22.09
Oct	I	25.92	149.08	115.87	142.07	5.52	17.34	175.50	14.98	22.37	56.09	32.00	113.92	215.71	22.80	42.19	15.60
	II	56.73	78.86	15.44	68.11	5.04	7.47	109.32	9.08	23.18	13.11	12.49	92.42	114.41	22.70	45.38	9.76
	III	4.68	47.58	7.81	18.56	5.27	5.08	123.84	9.29	11.89	137.48	9.42	17.25	31.76	6.89	19.90	8.68
Nov.	I	2.84	40.75	0.00	0.00	1.97	0.00	57.41	2.59	0.00	8.37	8.49	27.78	13.43	6.90	8.20	3.79
	II	5.88	12.04	1.51	0.00	4.41	0.00	27.10	5.61	4.37	4.77	9.53	13.68	9.17	3.96	8.43	5.91
	III	9.06	2.44	0.00	0.00	3.49	0.93	3.19	3.65	2.68	4.31	7.45	7.89	7.29	3.59	5.97	4.82
Dec.	I	0.00	2.47	0.00	0.00	0.00	1.35	1.06	2.22	4.28	7.49	6.37	2.86	2.22	5.40	7.38	4.38
	II	0.00	0.00	0.00	0.00	1.12	2.27	0.14	0.00	2.35	4.20	4.17	5.43	9.64	3.88	7.32	0.85
	III	0.00	1.27	0.00	0.00	1.12	0.00	1.91	1.64	0.00	2.16	1.88	3.98	6.29	3.13	3.91	1.92
Jan.	I	0.00	0.00	0.00	0.00	0.00	2.13	0.60	0.87	1.95	4.30	1.76	1.98	8.13	9.12	0.54	3.81
	II	0.00	0.81	0.00	0.00	1.80	0.46	0.78	1.99	0.00	6.71	3.29	3.71	1.46	19.22	2.65	3.23
	III	0.00	0.00	0.00	0.00	1.51	0.55	0.00	0.00	2.26	4.86	3.20	2.47	6.07	7.27	0.81	4.81
Feb.	I	0.00	0.00	0.00	0.00	1.68	0.00	0.35	2.19	0.88	3.21	5.09	5.03	2.39	5.72	11.73	1.61
	II	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.16	0.00	6.67	1.54	2.92	5.06	5.08	2.27	6.65
	III	0.00	0.00	0.00	0.00	0.78	0.60	2.20	0.00	0.00	4.54	0.92	2.67	1.41	6.22	3.33	2.59
March	I	0.00	0.00	0.00	1.32	1.14	0.00	0.00	1.02	3.51	4.21	3.91	2.73	2.98	4.60	2.90	3.07
	II	0.00	0.08	0.00	4.01	0.97	0.13	0.12	0.00	0.00	2.55	4.88	3.91	10.00	4.14	5.70	4.60
	III	0.00	0.00	0.00	0.00	0.69	0.00	0.00	0.00	0.00	2.95	3.60	2.66	5.18	5.39	5.17	7.89
April	I	0.00	0.00	0.00	0.36	0.06	0.00	0.00	0.00	4.40	2.21	4.65	2.02	4.24	5.96	2.53	4.82
	II	0.00	1.14	0.00	0.00	1.42	0.00	0.00	0.00	0.00	2.15	3.81	4.22	4.39	6.80	6.40	5.95
	III	0.00	0.00	0.00	3.69	1.91	28.06	0.00	0.01	0.00	5.25	4.36	5.60	3.89	3.17	6.40	4.66
May	I	0.00	0.41	0.00	0.00	0.00	0.00	1.63	0.08	1.11	0.53	3.21	2.17	6.97	4.88	5.26	3.75
	II	0.00	0.16	0.00	0.00	0.00	0.00	0.00	6.99	1.42	54.19	4.55	28.14	4.38	3.12	6.01	2.09
	III	0.00	0.00	0.00	0.42	2.49	0.00	19.42	0.00	2.33	3.92	3.70	32.47	6.86	3.18	5.95	2.56
Total run-off		1543.68	3286.72	2121.77	3339.90	3019.70	2582.59	3958.68	5472.03	1744.47	2560.85	2754.07	2938.72	2736.58	1980.89	2336.66	2430.26

TABLE 3-3

COMPUTATION FOR 90%, 75% & 50% DEPENDABLE YEARS  
BASED ON ANNUAL RUNOFF

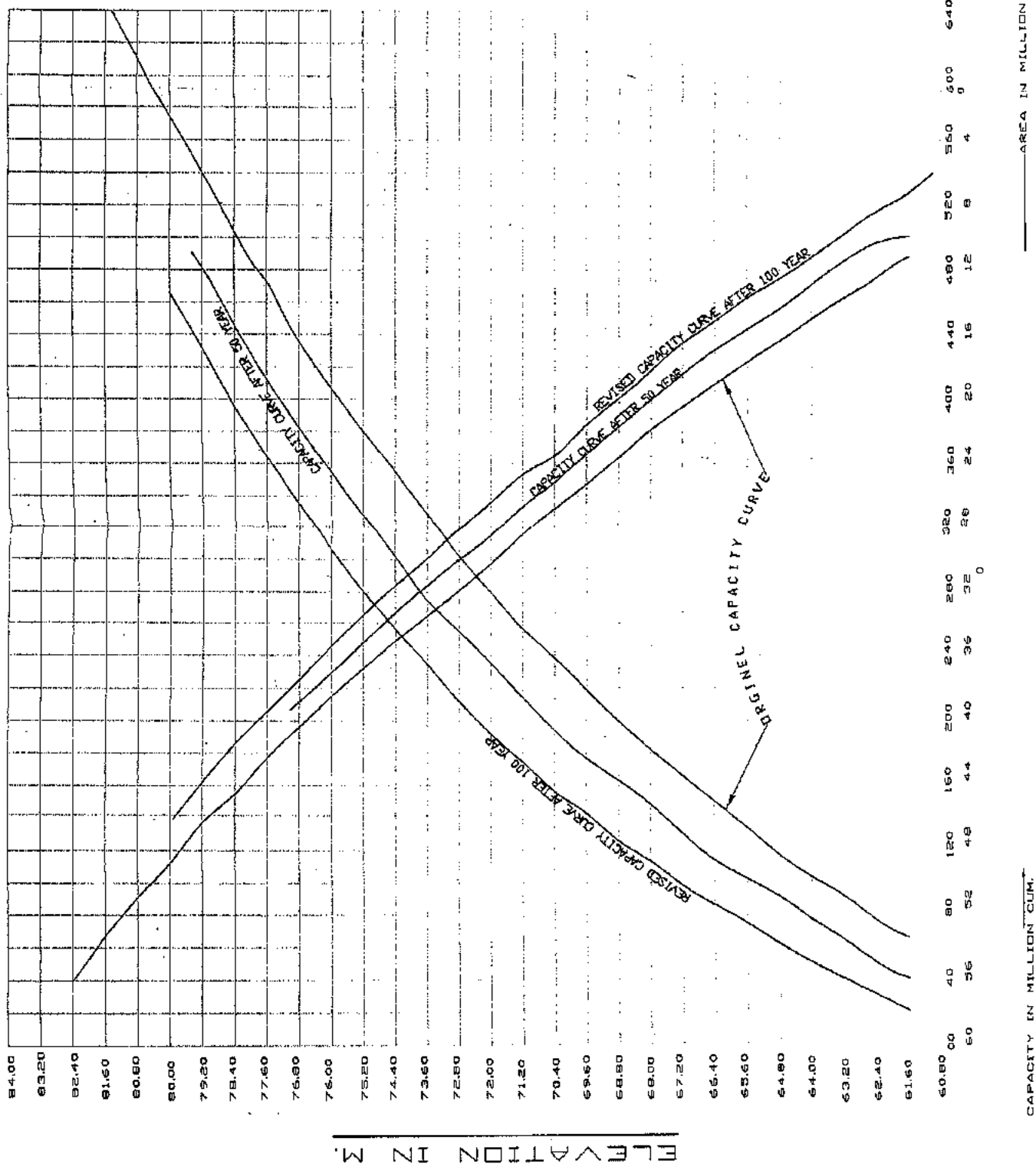
No.	Year	Runoff MCM	Runoff arranged in descending order	Ranking
1	87-88	1543.68	5472.03	1
2	88-89	3286.72	3958.68	2
3	89-90	2121.77	3339.90	3
4	90-91	3339.90	3286.72	4
5	91-92	3019.70	3019.70	5
6	92-93	2582.59	2960.85	6
7	93-94	3958.68	2938.72	7
8	94-95	5472.03	2754.07	8
9	95-96	1744.47	2736.58	9
10	96-97	2960.85	2582.59	10
11	97-98	2754.07	2430.28	11
12	98-99	2938.72	2335.66	12
13	99-00	2736.58	2121.77	13
14	00-01	1980.89	1980.89	14
15	01-02	2335.66	1744.47	15
16	02-03	2430.28	1543.68	16

No. of years for which data is  
available = 16

Description	Rank	Runoff	Corresponding Year
90% Dep. Year	15	1744.47	95-96
75% Dep. Year	13	2121.77	89-90
50% Dep. Year	9	2736.58	99-00



FIG.3.1 AREA CAPACITY CURVE (DAMAN SHP. 1&2)



CHAPTER -4

**Power Potential Studies**

## CHAPTER 4

### POWER POTENTIAL STUDIES

#### 4.1 Introduction

Power potential studies have been carried out based on the hydrological study described in the previous chapter. Based on available data of reservoir operation, Annual runoff from 1987 to 2003 period has been worked out for each year based on available ten daily inflows (in Mcum) and is presented in TABLE 3.2.

Power potential study has been carried out on the basis of 75% dependable year (1989-90) generation.

#### 4.2 Hydrology

Detailed hydrological studies are carried out in the previous chapter. Availability of flow for Daman Ganga Dam toe Small Hydropower Project-1 (through existing BPO – penstocks outlets) is presented in TABLE 4.1.

#### 4.3 Head

##### 4.3.1 Reservoir Operating Parameters

Full Reservoir Level (FRL): 79.86 m

Minimum Draw Down Level (MDDL): 61.60 m

##### 4.3.2 Tail Water Levels

For power potential studies the tail water level is assumed as constant, however it will vary with the flow in the channel. It has been assumed that the tail level will increase only during monsoon/ flood condition when the dam level will be maximum. At the time of MWL, the available head shall be more than the maximum operating head and therefore the energy generation will not change drastically. Tail water level varies from 42.5 m to 56 m. For power potential studies (SHP-1) average tail water level of 49.25 m has been considered.

##### Head Loss

Head loss for rated discharge of 13.55 cumec is calculated. A constant head loss of 1.5 m is taken for power studies.

#### 4.4 Operating Conditions

##### 4.4.1 Permissible Operating Head Range

Electro-mechanical equipments are designed for various head and discharge ranges required for specific project requirements and it also varies with the supplier.

Proposed Daman Ganga dam Toe Small Hydropower Project -1 is proposed on dam toe and will operate in various head conditions. The availability of head is summarized below:

$$\begin{aligned}\text{Maximum Head available: } & \text{FRL} - \text{TWL} - \text{Head Loss} \\ & = 79.86 - 49.25 - 1.5 = 29.11 \text{ m}\end{aligned}$$

$$\begin{aligned}\text{Minimum Head available: } & \text{MDDL} - \text{TWL} - \text{Head Loss} \\ & = 61.60 - 49.25 - 0.5^* = 11.85 \text{ m}\end{aligned}$$

*\* Head loss will be less during low flow condition*

The plant size studies are carried out for rated head of 27 m. Maximum and minimum operating head limits are taken as per USBR manual as well as discussions had with equipment designers/ suppliers, which are given below:

Maximum Head:	1.25 times of rated head
Minimum Head:	0.65 times of rated head

##### 4.4.2 Discharge Range

###### Minimum Discharge

Two units each of 1500 kW capacity are proposed to generate optimum energy. However sometimes irrigation requirement is less than the minimum operating discharge, which will not be utilised for power generation.

40% of rated discharge is taken as the minimum limit of discharge for generation.

###### Maximum Discharge

The Daman Ganga Dam Toe SHP-1 is proposed on the existing penstocks. Maximum velocity of 3.0 m/s through the concrete square penstock has been considered as the limiting velocity. Based on limiting velocity of 3.0m/s, about 13.55 cumec discharge is considered as the maximum discharge for SHP-1.

#### 4.5 Efficiencies

For power and energy computations, it is proposed that two units of vertical Kaplan turbine would be used for power generation. Following efficiencies of turbine and generator are taken for optimisation studies.

Turbine:	88%
Generator	95%

#### 4.6 Number of Units

Annual energy with two units are worked out as summarized below:

Installed capacity	Two Units
3000 KW	12.95 MUs

#### 4.7 Detailed Energy calculations

For the finalized option, detailed energy calculations are presented in this report. A series of generated power and energy are separately presented in TABLE 4-1.

#### 4.8 Dependable Year Energy

Annual energy corresponding to 75% dependable year at 95% Plant Availability has been worked out in TABLE 4-1. The annual energy in 75% dependable year is presented below:

Dependable Year(1989-90)	Annual Energy	Plant Load Factor
75% dependable Year	12.95 MUs	51.86 %