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<b>ABBREVIATIONS AND ACRONYMS</b>	
CPHEEO crore DPR	Central Public Health and Environmental Engineering Organization One crore = 100 lakh = 10 million Detailed Project Report
GAP GOI	Ganga Action Plan Government of India
Ha	Hectare
I&D IL IPS ISO IWM	Interception and Diversion Invert Level Intermediate Pumping Station International Organization for Standardization Integrated Wastewater Management
JBIC JICA	Japan Bank for International Cooperation Japan International Cooperation Agency
kg kg/ha/day km km <sup>2</sup>	Kilogram Kilogram per hectare per day Kilometre Square Kilometre
L lakh LCB LCS L/m <sup>2</sup> /day lpcd	Litre One lakh = 100,000 Local Competitive Bidding Low Cost Sanitation Litre per square meter per day Litre per capita per day
m m <sup>3</sup> /day mg/L MCM MC MGD MIS MLD MoEF MPS MSL	Meter cubic meters per day Milligram per litre Million Cubic Meters Municipal Corporation Million Gallons per Day Management Information System Million Litres per day Ministry of Environment and Forests Main Pumping Station Mean Sea Level
NGO NIT NRCD NRCP	Non-Government Organization Notice Inviting Tender National River Conservation Directorate, Ministry of Environment & Forests National River Conservation Plan
O & M OJT	Operation and Maintenance On-the-Job Training
P-M PCRI PHED PIA PMC PP&PA PR PSP PWD	Person-Months Pollution Control Research Institute Public Health and Engineering Department Project Implementation Agency Project Management Consultants Public Participation and Public Awareness Public Relations Private Sector Participation Public Works Department
QA QC	Quality Assurance Quality Control



<b>ABBREVIATIONS AND ACRONYMS</b>	
RAP	Reform Action Plan
RCC	Reinforced Cement Concrete
S/W	Scope of Work
SC	Steering Committee
SOP	Statement of Performance
SPCB	State Pollution Control Board
STP	Sewage Treatment Plant
TOR	Terms of Reference
T/T	Technology Transfer
UASB	Upflow Anaerobic Sludge Blanket
ULB	Urban Local Body
WW	Wastewater
WWTP	Wastewater Treatment Plant
YAP-II	Yamuna Action Plan – Phase II



## 1. INTRODUCTION

### 1.1. BACKGROUND

Government of India decided to take up pollution control measures for Yamuna River, with the objective of improving the water quality of the river and Yamuna Action Plan was launched to be implemented in 3 phases- YAP-I, YAP-II and YAP-III.

Yamuna Action Plan Phase-I (YAP-I) was launched by the National River Conservation Directorate (NRCD), Ministry of Environment and Forests (MoEF) in 1993 with the goal of restoring the desired bathing quality of Yamuna river throughout its reaches from Yamunanagar in Haryana to its confluence with the Ganga River at Allahabad, Uttar Pradesh. In the YAP I Project, which was completed in February, 2003, pollution abatement works were constructed in 6 Towns within Haryana ie, Yamunanagar-Jagadhri, Karnal, Panipat, Sonapat, Faridabad and Gurgaon. About 133 km interception and diversion (I&D) sewers were laid and 11 nos of Sewage Treatment Plants (STPs) (10 nos UASB and 1 no Oxidation Pond) with total capacity 303 MLD were constructed in these six (6) towns. In addition several non-sewerage schemes like Low cost sanitation units, improved wood based crematoria, bathing Ghats, Afforestation schemes etc were also implemented.

For implementing YAP schemes, **Japan Bank for International Cooperation (JBIC)** is the Funding Agency, **National River Conservation Directorate (NRCD)** is the Executing Agency, **PWD Public Health Branch**, Haryana is the Project Implementing Agency (PIA) for management of Water Supply and Sewerage in Urban towns of Haryana. **Project Management Consultants (PMC)** were commissioned by NRCD to manage and monitor implementation of YAP-II components and **Urban Local Bodies (ULB's)** in project towns are to be made responsible for operation and maintenance of assets.

As per the 74<sup>th</sup> Amendment of Constitution, Infrastructure assets created within ULBs areas are required to be taken up by ULBs for Operation and Maintenance of the same. To enhance Techno-managerial capacity of ULBs in the project towns (YAP-I), the Capacity Building of ULBs needed to be undertaken through **Engineering Technology Transfer and Reform Action Plan**. In addition action is needed to be taken up for creating public awareness and participation in creating and managing such assets through separate **Public Participation and Awareness Programme (PP&PA)**.

In order to transfer assets to ULBs, the most essential component considered is to enhance Engineering/Technology capacity of ULBs by transferring knowledge/skills through participatory on job training. For such on job training and knowledge/skill transfer some components of works in continuation of YAP-I have been identified in each town.

In view of above PWD-PH Branch, Government of Haryana decided to engage consultants for **Engineering Technology Transfer to Urban Local Bodies in six towns of Haryana** namely **Yamunanagar-Jagadhri, Karnal, Panipat, Sonapat, Faridabad and Gurgaon** and invited proposals from short listed consultants. **M/s Consulting Engineering Services**



**(I) Pvt Ltd** have been finally selected from the shortlisted consultants for the execution of the work.

## **1.2. SCOPE OF WORK AND DESCRIPTION OF THE SERVICES**

### **1.2.1. SCOPE OF WORK**

The Scope of Services indicated in the Request of Proposal for the Consultants is as follows:

- Review of Project Component as suggested by Haryana PWD, PH Branch for physical works,
- Review of existing sewerage system vis-à-vis its Utilization,
- Review of Operation and Maintenance (O&M) of the existing system,
- Carrying out field Topography Survey, necessary geo-technical and other investigation, collection of data & information as may be required for preparation of Detailed Project Report,
- Preparation & submission of Draft Detailed Project Report (Draft DPR) in discussion with PWD, PH Branch, Government Of Haryana, Project Management Consultants,
- Preparation of Final DPR after incorporating of all comments from PMC, PWD, PH Branch & NRCDD,
- Preparation of Bid documents as per the guidelines provided by Project Management Consultants,
- Providing necessary assistance to PMC / PWD, PH Branch in evaluation of bids and award of contract.
- Supervision of the construction work to monitor the progress of work including quality control,
- Implementation of appropriate Training Programme for ULBs, as per guidelines provided by PMC / PWD, PH Branch / NRCDD for Transferring Engineering Technology to ULBs, by organising
  - Class room training program,
  - Conducting workshop and seminars on the project implementation procedures.

In addition to this during the project implementation, the Consultant shall submit the following reports.

- Inception Report
- Survey Report
- Draft Detailed Project Report
- Final Detailed Project Report
- Pre-qualification Document for appointment of Contractor
- Draft Bid Document for appointment of Contractor
- Final Bid Document for appointment of Contractor
- Evaluation Report for bids received from the Contractors
- Monthly Progress report
- Operation and Maintenance Manual
- Supervision Manual
- Project Completion Report



### **1.2.2. DESCRIPTION OF SERVICES**

Under YAP-II in order to enhance the process of Engineering Technology Transfer to ULBs of Yamunanagar-Jagadhri, Karnal, Panipat, Sonapat, Faridabad and Gurgaon, field work cum study will be taken up as part of field training programme to train ULB engineers and technical staff on aspects like technical parameters, on-site management etc. as required for developing any new sewerage system. To facilitate wide exposure of different components of the sewerage system, construction of new systems with sewers of varied diameter & length, ancillary structures like pumping station. The construction for YAP-II will be taken up maintaining the integration of such systems with the total system.

The above is expected to be the most effective means of Knowledge/skill transfer, on the job training through practical application and seeing a task being carried out. It is essentially learning by doing that enables day-to-day association, interaction and communication with PHED Engineers and the Consultants on the job.

#### **1. Yamunanagar-Jagadhri**

Yamunanagar-Jagadhri is located on the left bank of river Yamuna at a distance of 200kms from Delhi. The latitude and longitude of the town is 33°11' N and 77°10' E respectively. The town covers an area of 26.71 sq km with an estimated population of about 190,000 in the year 2002. The town is located in a relatively flat terrain sloping from north-east to south-west. Average altitude of the town is 278m above mean sea level. It is an important industrial town having industries like paper processing, starch, distillery, sugar mills, etc.

As a part of the project it is tentatively proposed to lay sewers at different places of diameters varying from 200 mm to 760 mm and box types sewers measuring around 41600 m in length where applicable.

#### **2. Karnal**

Karnal a town founded for King Karna by the Kauravas is located on the bank of Yamuna river at a distance of 123kms north of Delhi. The latitude and longitude of the town is 28°40' N and 76°59' E respectively. The town is located at an average altitude of 243.90m above mean sea level. The municipal limit of the town covers an area of 22.10 sq km. The total population of the town in 2001 was around 2,22,000. The municipal area does not include the new extensions and areas being developed by the Haryana Urban Development Authority (HUDA). The town is developed mostly as residential with a large number of office complexes and institutions.

Tentative proposals are to take up a) construction of sewer system with varying diameters from 250 mm to 600 mm of about 18,650 m in length including gravity and pumping mains in different localities, b) construction of sump well with installation of adequate pumping machinery with all accessories etc.



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### 3. Panipat

Panipat has a very glorious place in the History of India. This town, which is situated 90km from Delhi new NH-1 on 'Sher Shah Suri Marg'. Three Major battles which guided the course of Indian History have given a special status to Panipat a new way. Panipat town is famous in India by the name of "City of Weaver". It also has a significant place in the International Market for "Handloom Production". Darri, Carpet Mat, Table Cover, Bed sheet, Bed Cover, Curtain etc which are exported to Canada, Japan, Germany & Australia. Today however Panipat is also of significant importance as an industrial town with a power plant, fertilizer plant and oil refinery.

It is tentatively proposed to construct interconnecting sewers of diameters from 300 mm to 600 mm of about 15250 m in length in different localities.

### 4. Sonipat

Sonipat town is situated in the National Capital Region (NCR) at a distance of about 50km to the north of Delhi on NH-1. The town covers an area of 18.25 sq km with year 2000 population of 220,000. The latitude and longitude of the town is 29°N and 77°E respectively. The average altitude of the town is 224.15m above mean sea level. The town is mainly residential in nature but growing up speedily due to its location within the NCR.

It is tentatively proposed to lay 13550 m in length of interconnecting sewers from diameter varying from 250 mm to 600 mm in different localities and construct one intermediate pumping station of 3.7 MLD capacity with all accessories/machinery including land acquisition.

### 5. Faridabad

Faridabad town is located on the south-eastern side of Delhi and has grown enormously during the last couple of decades. The main reason for growth is the rapid industrialization of the area. It is a large agglomeration of three towns viz. Old Faridabad, Ballabgarh and New Industrial Township. The town spreads over an area of 216.4 sq km and 2001 census population of the town was 1.054 million. The town is within the NCR and is about 30km from Delhi. The latitude and longitude of the town is 28°25' N and 77°20' E respectively. Two major canals, Agra Canal and Gurgaon Canal flow through Faridabad town.

It is tentatively proposed to construct inter connecting sewers diameter varying 600 mm to 1000 mm in size of total length of 24,000 m in various localities like sector 7, 9, 14 and 18, Sanjay Gandhi Memorial Nagar sector 48, Sanjay Gandhi colony part I, II and III sector 23, Sector 21-A, Dabua and Jawahar Colony.



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## 6. Gurgaon

Gurgaon was a small town in the early 80's. Because of its close proximity to Delhi and excellent infrastructure, Gurgaon has now become a very significant corporate destination. It is also the main industrial hub of Haryana and a Cyber Town. The town is spread over an area of 15.33 sq km with 2002 estimated population as 239,000. It is situated within the National Capital Region (NCR) and at a distance of about 32km from Delhi. The latitude and longitude of the town is 28° 3' N and 77° E respectively. The office and manufacturing plant of India's largest car maker Maruti Udyog Limited is located at Gurgaon.

It is proposed to construct 12.26 Km of sewer of varying in sizes from 200 mm to 900 mm at different localities, improvement works for main pumping station.

### 1.2.2.1. FORMAL CLASSROOM TRAINING:

Training will need to be organized with on site field training programme, to train personnel of ULBs in management of records of incidences, system information, preparation of annual operation & maintenance plan, and such other in respect to the existing system to attain a desired level of operation and maintenance standard for the system. Such training programme both on site and off site would be highly beneficial to the engineering staff of ULBs.

Based on the needs assessment exercise, the knowledge gaps between the staff skills and the new job responsibilities will be identified and accordingly the training courses will be developed by the consultants.

### 1.2.2.2. WORKSHOPS AND SEMINARS:

The consultant shall organize workshops and seminars during the continuance of the project at any or all of the three project offices at Panipat, Faridabad and Yamunanagar. Only officials of the concerned ULB's and other stakeholders (JBIC, NRCD, PMC and like) shall be invited to attend such workshops. The Consultants on mobilization shall frame a programme in discussion with Employer and PMC for such workshops.

## 1.3. OBJECTIVE

With the objective of improving the water quality of river Yamuna and restoring it to the desired Bathing Class, Yamuna Action Plan (YAP) was launched in 1993, primarily targeting six major towns, namely Yamuna Nagar, Karnal, Panipat, Sonapat, Gurgaon and Faridabad, located in the vicinity of river Yamuna.

Since then the, following significant steps have been initiated in the six project towns by:

- Laying of trunk and intercepting sewers, for diversion of sewage flowing into the river Yamuna through sewage pumping stations to sewage treatment plant.
- Construction of sewage pumping stations, sewage treatment plants to treat the captured sewage,



- Providing electric /improved crematorium to arrest pollution from unburnt human carcass and low cost sanitation units to desist poorer section of people from open defecation.

Having created all the above assets under YAP – II, the project under reference, envisages to transfer such assets to the concerned urban local bodies for operation and maintenance. Consequently, the project also envisages enhancing the techno-managerial capability of ULBs' engineers and technical staff through transfers of technology and skill by means of participatory as well as class room study on the following aspects:

- Technical parameters, system planning and design procedures and technologies, including field investigation, community and socio-economic interface.
- Construction management and monitoring procedures and techniques including quality control and safety aspects.
- Operation and maintenance procedures and practices including preparation and maintenance of O&M manuals and safety requirements.

#### **1.4. ROLE OF THE CONSULTANTS (CONSULTING ENGINEERING SERVICES (I) PVT LTD).**

The role of the Consultants will be:

- ◆ Review of already prepared schemes/DPRs and updating the same.
- ◆ Preparation of Detailed Designs of the works to be executed as per CPHEEO and NRCD guidelines.
- ◆ Preparation of bid documents and assist in the procurement process for the proposed wastewater work
- ◆ Quality and progress monitoring of construction works.
- ◆ Day-to-day supervision of the construction work and “on-the-job training” of ULBs.
- ◆ Preparation of customized manuals for supervision and O&M of the wastewater facilities.

Consultants will function in close coordination with and under the overall guidance of PIA/PMC and, Steering Committee and Working Committee, besides officials of PHED and ULBs

#### **1.5. APPOINTMENT OF CONSULTANTS AND MOBILIZATION OF THE TEAM**

Following submission of a proposal on 22<sup>nd</sup> August 2005, M/s Consulting Engineering Services (I) Pvt Ltd. was ranked highest in PWD Public Health Branch's technical evaluation. A comprehensive negotiation process was carried out. The award letter to commence the work was issued by PWD Public Health Branch on 16<sup>th</sup> March, 2006, allowing a mobilization period of 30 days and M/s Consulting Engineering Services (I) Pvt Ltd commenced services on 12<sup>th</sup> April, 2006. This Inception Report is being submitted in compliance with the requirements of the Agreement to provide an overview of the prevailing situation and issues needing attention by all concerned.



### 1.5.1. CONSULTANT MOBILISATION

Consultants took up their mobilization efforts on receipt of the award letter. Interactions were held with the Executive Engineers in respective project towns to ensure availability of office space, mobilization of staff from various places, finalization of specifications and rates for office furniture and equipment etc. Consultants applied for approval of PWD PH branch on the specifications and configurations of proposed office equipment and furniture and the same been received. Consultants commenced their services on 12<sup>th</sup> April 2006 and gradual mobilization of the Team has been achieved over the initial one month involving deployment of the following professionals and support staff to date:

- Mr. Subrata Gupta, Team Leader / Project Manager. (on 12<sup>th</sup> April 2006)
- Mr. T. K. Rakshit, Project Engineer (1), Yamunanagar. (on 18<sup>th</sup> April 2006)
- Mr. S. Choudhury, Project Engineer (2), Panipat. (on 18<sup>th</sup> April 2006)
- Mr. R. K. Sharma, Project Engineer (3), Faridabad. (on 12<sup>th</sup> April 2006)
- Mr. Maninder Mahour, Junior Engineer, Yamunanagar. (on 2<sup>nd</sup> May 2006)
- Mr. K. N. Kashyap, Junior Engineer, Yamunanagar. (on 17<sup>th</sup> May 2006)
- Mr. S. K. Gulati, Junior Engineer, Panipat. (on 19<sup>th</sup> May 2006)
- Mr. V. P. Mehta, Junior Engineer, Panipat. (on 8<sup>th</sup> May 2006)
- Mr. Baninder Singh, Junior Engineer, Faridabad. (on 31<sup>th</sup> May 2006)
- Mr. G. Sharma, Junior Engineer, Faridabad. (on 12<sup>th</sup> April 2006)
- Ms. Rajani Sharma, CAD/EDP, Yamunanagar. (on 26<sup>th</sup> May 2006)
- Mr Soumya Mazumdar, CAD/EDP, Panipat. (on 25<sup>th</sup> May 2006)
- Mr. Suresh Kumar Choudhury, CAD/EDP, Faridabad. (on 5<sup>th</sup> June 2006)
- Mr. Inder Raj Kaundal, Computer Operator, Panipat. (on 18<sup>th</sup> May 2006)
- Mr. N. C. Dutta, Survey Engineer, Yamunanagar. (on 22<sup>th</sup> May 2006)
- Mr. S. K. Sachdeva, Survey Engineer, Panipat. (on 22<sup>th</sup> May 2006)
- Mr. Arvinda Singh, Survey Engineer, Sonipat. (on 29<sup>th</sup> May 2006)
- Mr. Yashvir Singh, Survey Engineer, Faridabad. (on 29<sup>th</sup> May 2006)
- Mr. Mandeep, Office Boy, Yamunanagar
- Mr. Raman, Office Boy, Panipat.
- Mr. Sandeep, Office Boy, Faridabad.

Mr. T K Rakshit and Mr. S Choudhury are replacements to Mr. D K Guin and Mr. A Chakrabarty respectively as the latter persons are not available. Necessary approval of PIA had been obtained for such replacements. The CAD/EDP operators for Yamunanagar and Panipat are in position as the equipments are in position by May 22, 2006. Survey Engineers and Survey Teams have been appointed and survey work in the field has been commenced in Yamunanagar, Panipat and Faridabad on 22.05.06, 27.05.06 and 27.05.06 respectively. The O&M expert and the Training experts will also be positioned at the appropriate time.



## 1.5.2. SITUATION ANALYSIS

The Consultants Team of Experts mobilized personnel in all the six towns namely Faridabad, Gurgaon, Panipat, Sonapat, Karnal and Yamunanagar for carrying out the tasks, Assignment Management and Data Collection suggested as per proposed Approach and Methodology. The Team Leader and Project Engineer of the Consultants had intensive interaction with the respective Executive Engineers and their staff and established working rapport with them keeping them informed from time to time about the developments.

### General

After interacting with all the four Executive Engineers and their supporting staff to understand their perception of the work executed in YAP-I under their respective areas, the present status of operation and maintenance, the perceived views for implementing the immediate supplementary requirement for sewerage work within the limited scope of funds provided in YAP-II. Considering the expectations of the residents of the specific area of the six towns for satisfactory functioning of the sewerage system to cover effectively the collection and disposal of the wastewater generated in the areas being taken up for YAP-II, the consultants made extensive reconnaissance in all the six towns and themselves took a feed back from different localities feedback from the personal operating some pumping stations and UASB treatment plants were also taken to make the best possible assessment of the situations.

1. The system in place after implementation of YAP-I in terms of collection of sewage from the household to be finally transferred to the treatment plant, through interconnecting and terminal sewer lines with intermediate pumping stations, which are in position do not appear to be satisfactorily functional due to a variety of problems like:
  - a. Inadequate staff of PHED for maintaining a satisfactory functional level of the sewer lines.
  - b. A number of pockets generating sewage, which are not integrated with a proper collection system to a collection point.
  - c. Erratic power supply to the intermediate and main pumping stations with erratic functioning with unreliable alternative back up power source.
  - d. Growing demand of the public for immediate redressal of wastewater disposal problem especially during the rains.
  - e. Lack of clarity and communication between the Municipal Body and the Public Health Engineering Department regarding the ownership of the assets created.
  - f. Very lean workforce with the municipal bodies for operation and maintenance of the existing system under their control if any.
  - g. Poor knowledge level and skill of the personnel operating the treatment plants and pumping stations with practically no commitment to meet the objectives of the YAP except for stray exceptions.



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- h. Very poor functional efficiency of almost all the treatment plants, partly because of erratic power supply and poor maintenance of the assets created especially of the mechanical equipment.
  - i. Generation of data regarding flow and performance of the treatment plants which do not seem to have correlation to the actual existing situation.

The data made available by the PHED in the DPR for the prospective scope of work for YAP-II cannot be readily corroborated with the site conditions creating doubts about the satisfactory functioning of whatever has been implemented in YAP-I due to the poor health of the sewer line upstream and downstream of the interconnecting points.

A brief write up on the activities carried out by the consultant's team as per proposed Approach and Methodology are presented below town wise.



### 1.5.2.1. YAMUNANAGAR-JAGADHRI AND KARNAL

The Consultant has undertaken the following activities for Yamunanagar and Karnal Towns.

M/s Consulting Engineer Services (I) Pvt Ltd met PHED officials immediately after mobilization and requested them to hand over the premises for setting up the office. Office space was provided by PHED at the 25 MLD STP premises at Yamunanagar. The office has since been furnished with the complete list of approved furniture and specified equipment for regular functioning. The Executive Engineer has provided the DPR, Plans and whatsoever data available in his office duly supported by full cooperation of his staff for Yamunanagar-Jagadhri and Karnal towns. The data requested for Yamunanagar-Jagadhri and Karnal Towns are as below.

1. Complete list and information on line agencies
2. Base maps
3. Land use / development master plans, area development plans
4. Details of on-going and planned development programmes
5. Reports for already identified projects
6. Physical and functional data on existing sewerage system
7. Sub-soil characteristics
8. Water supply status including user habits
9. Demographic data
10. Prevailing Laws and By Laws and regulatory provisions and practices
11. Schedule of rates

Till date the following information/documents have been received for both the towns.

1. Project Report of the Existing Sewerage system
2. Project Report prepared by PHED officials for the work to be undertaken under YAP-II.
3. Key plan of Yamunanagar and Karnal town.
4. Census/Population data.
5. Schedule of rate
6. Ward wise drawing
7. Design Criteria followed by PHED for sewer lines.
8. Ward wise population

Initially for Yamunanagar-Jagadhri which is actually a twin town and Karnal town, various areas were indicated for preparation of DPR for YAP-II which are as follows.

For Yamunanagar-Jagadhri Town		For Karnal Town
1. Labour Colony	21. Ishorpur Colony	1. Janakpuri-Sadar Bagar
2. Harbanspur	22. Vishnu Nagar Extension	2. Shiv Colony (Part)
3. Lakshmi Garden	23. Camp Area	3. Bahadur Chand Colony
4. Vishnu Nagar	24. Patel Nagar	4. Shewaji Colony
5. Tilak Nagar	25. Anand Colony	5. HAP Complex Madhuban Area.



6. Parhlad Puri	26. Gulab Nagar	
7. Gupta Colony	27. Vijay Colony	
8. Vikas Nagar	28. Jammu Colony	
9. Vishal Nagar	29. Arjun Nagar	
10. Krishna Colony	30. Hairjan Majri	
11. Govind Puri	31. Guru Nank Puri	
12. Modern Colony	32. Gandhi Dham	
13. Tagore Garden	33. Lal Dawra	
14. Industrial Area	34. Bhatia Nagar	
15. Professor Colony	35. Golder Colony	
16. Aggarsain Chowk to Buria Chowk	36. Gali Thaper	
17. Kalyan Nagar	37. Sondhi Mohalla	
18. Sarswati Colony	38. Vishkarma Mohalla	
19. Mansa Singh Gurudwara	39. Azad Nagar	
20. S D School		

Accordingly, engineers of Consultant's Team started visiting the sites and conducted reconnaissance survey. Simultaneously, the data provided by the PHED was reviewed. It was observed that the list of works was too exhaustive to be accommodated within the stipulated fund as also the scope of services of the consultants.

At the request of the Consultants a **Start Up Meeting** involving the PMC, Executive Engineers in charge of the six project towns and their teams and the consultants representative including their Sr. Associate Director, in the chamber of Engineer-in-Chief, PWD PH Branch Haryana at Panchkula was held on 9<sup>th</sup> May 2006, in which the working procedure and bottlenecks for implementation of the project area were discussed and streamlined, (Refer section 1.6 Project initiation meetings and liaison with stakeholders of the Inception Report). This was followed up by a meeting with the Executive Engineer- at Yamunanagar on 10.05.2006 for selection of the priority areas for Yamunanagar-Jagadhri Town and Karnal Town from the list of thirty nine areas for Yamunanagar-Jagadhri Town and five areas for Karnal Town already furnished which are identified as follows for preparation of a DPR for the implementation of YAP-II as Phase I with the objective of tendering out the work and executing the same within the current financial year, limiting the budgetary expenditure to about Rs 1.5 crores for each town. A map of Yamunanagar-Jagadhri and Karnal showing the priority area are enclosed as Drawing No-2006037/EE/IR-03 & Drawing No-2006037/EE/IR-02 respectively.

For Yamunanagar-Jagadhri Town	For Karnal Town
1. Labour Colony	1. Janakpuri-Sadar Bazar
2. Friends Colony	
3. Lajpat Nagar	
4. Green Park	
5. Lakshmi Garden	
6. Vishnu Nagar	
7. Bawa Colony	
8. Vikash Nagar	
9. Jammu Colony	
10. Azad Nagar	
11. Saraswati Colony	
12. Gobind Garh	



It was also indicated by the EE that the areas adjoining the above mentioned priorities areas for Yamunanagar-Jagadhri Towns and Karnal Town should also be considered for preparation of the DPR. This interaction was followed by a meeting with the Municipal Committee of Yamunanagar-Jagadhri Town convened by the Executive Engineer at the instance of the Consultant.

Immediately after the meeting, the consultants mobilized for commencement of survey work for the above-mentioned priorities areas for Yamunanagar-Jagadhri Town and Karnal Town. The detailed field survey has been commenced on 22.05.06. Simultaneously other data pertinent to the preparation of the DPR are been collected and analyzed by the consultant.

Letters have also been addressed to the Municipal bodies for identification of technical personal to get association with the work being done by the Consultants as part of the training for skill improvement. But so far no response has been received from the municipal body.

### **Office Furnishing:**

As approved by PHED the following furniture have been inspected, procured and accommodated in the office.

<b>Sl. No</b>	<b>Description</b>	<b>Number</b>
1	Table (3ft X 5ft)	1
2	Table (2 ½ ft X 4ft)	3
3	Revolving Chair	1
4	Office Chair	6
5	Steel Filing Rack	1
6	Stool for office boy	1
7	Desert Cooler	1

Required furnishing items like Curtains, Tube lights, Fan, Desert Cooler, Power Points and Switches etc have already been provided the latter facilitate installation, testing & commissioning of equipments. Office furnishing will continue further as per requirement and all the office equipment will be commissioned well in time to ensure smooth functioning of the office.

### **Office Equipment:**

As per approved list and specifications the following equipment have so far been procured, installed and loaded with back up software as per specifications.

<b>Sl. No</b>	<b>Description</b>	<b>Number</b>
1	Computer	2
2	Photocopier	1



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### **Sanitary condition in YAMUNANAGAR TOWN.**

Prior to YAP-I, about 106km of sewer lines of varying sizes of 200 – 900mm diameter were laid in different areas of the town. Three pumping stations were also installed, which used to pump untreated sewage into the Ganda Nala (which is a large open drain running through the entire town from north to south and discharges into Western Yamuna Canal) and partly directly to Western Yamuna Canal.

Under YAP-I schemes, 33km of intercepting sewers of sizes 200 – 1200mm diameter, 2.8km of rising main of 500mm diameter, two intermediate pumping stations, one terminal pumping station, two sewage treatment plants of 10Mld and 35 Mld based on UASB technology were installed and commissioned. The whole town has been divided into three sewerage zones. The wastewater generated from these three zones is treated at the two sewage treatment plants of 35Mld capacity in Zone I & II and 10Mld in Zone III.

Approximately, 85% of the population of the town is connected to the sewerage system and collection efficiency is estimated around 70%. 21% of the town population lives in slums where there is no sewerage network as per DPR provided by PHED officials. Septic tanks and soak pits exist in these areas.

### **Sanitary condition of KARNAL TOWN**

Part of the town, which was seweraged earlier, catered to about half the town population. Three sewage pumping stations (located at Ramnagar, Model Town and Delhi By-pass road) used to pump the collected sewage into open drains. In absence of any treatment facility, wastewater flowed into the river Yamuna through drain no. 1 and indri escape.

About 103km of sewer of varying sizes from 200mm to 1600mm diameter out of which 17.5km under YAP-I, was laid in different parts of the town. About 60% of the town is seweraged. The wastewater generated is treated at the two existing sewage treatment plants of 40Mld capacity using UASB technology for Zone I and 8Mld through Oxidation Pond in Zone II.



### 1.5.2.2. PANIPAT AND SONIPAT.

The Consultant has undertaken the Following Activities for Panipat and Sonipat Towns.

The consultants met PHED officials immediately after mobilization and requested them to hand over the premises for setting up the office. Office space was provided by PHED at the 10 MLD STP premises but the same had to be shifted to the 35 MLD STP at Panipat because the power situation was unsatisfactory. The office has since been furnished with the complete list of approved furniture and specified equipment for regular functioning. The Executive Engineer has provided the DPR, Plans and whatsoever data that was available in the office duly supported by full cooperation of his staff for Panipat and Sonipat towns. The data requested for Panipat and Sonipat Towns are as below.

- Complete list and information on line agencies
- Base maps
- Land use / development master plans, area development plans
- Details of on-going and planned development programmes
- Reports for already identified projects
- Physical and functional data on existing sewerage system
- Sub-soil characteristics
- Water supply status including user habits
- Demographic data
- Prevailing Laws and By Laws and regulatory provisions and practices
- Schedule of rates

Till date the following information/documents have been received for both the towns.

1. Project Report of the Existing Sewerage system
2. Project Report prepared by PHED officials for the work to be undertaken under YAP-II.
3. Key plan of Panipat and Sonipat town
4. Census/Population data.
5. Schedule of rate
6. Ward wise drawing
7. Design Criteria followed by PHED for sewer lines.
8. Ward wise population

Initially for Panipat town and Sonipat town the following areas for preparation of DPR for YAP-II are as follows.

For Panipat Town	For Sonipat Town
1. Adarsh Nagar	1. Jiwan Vihar
2. Bishan Swarup Colony	2. Mam Chand Colony
3. Batra Colony	3. Shiv Colony
4. Roshan Lal Conlony	4. Baba Colony



5. Pure Wal Colony	5. Bhagat Singh Colony
6. Virat Nagar	6. Uttam Nagar
7. New Model Town Area	7. 4 Marla Area
8. Left out area of Krishan Pura	
9. Ward No 7 & 8	
10. Khatik Basti	

Accordingly engineers of Consultant's Team started visiting the sites and conducted reconnaissance survey. Simultaneously the data provided by the PHED was reviewed. It was pointed out to the PHED engineers that some of the areas were not indicated in the project report prepared by PHED. The non-inclusion in the project report of the nine areas mentioned as above were brought to the knowledge of EE in charge of both Panipat and Sonipat. Simultaneously the data provided by the PHED was reviewed and was observed that the list of works was too exhaustive to be accommodated within the available fund as also within the scope of services of consultants. As was decided in the start up meeting held on 9<sup>th</sup> May 2006, some areas were prioritized on the basis of the long list provided and supported by interaction and discussion with the Executive Engineer for taking up activities by consultants to achieve disbursement of about Rs 1.5 to Rs 2.0 Crores within the current financial year. Consultants should prepare some mini-DPRs accordingly as Phase I of the project per town. Depending upon the work taken up in Phase I subject to the limitation of funds, work will be taken up for executing sewerage work in phase II be preparing mini DPRs for the remaining areas/ lengths that demand implementation in YAP-II.

As in the case of Yamunanagar-Jagadhri a meeting with the Executive Engineer- at Panipat was held on 10.05.2006 for selection of the priority areas for Panipat Town and Sonipat Town from the list of ten areas for Panipat Town and seven areas for Sonipat Town already furnished which are identified as follows for preparation of a DPR for the implementation of YAP-II as Phase I with the objective of tendering out the work and executing the same within the current financial year, limiting the budgetary expenditure to about Rs 1.5 crores for each town.

<b>For Panipat Town</b>	<b>For Sonipat Town</b>
1. Batra Colony	1. Jiwan Vihar
2. Pur Wal Colony	2. Mam Chand Colony
3. Roshan Lal colony	3. Shiv Colony

It was also indicated by the EE that the areas adjoining the above mentioned priorities areas for Panipat Towns and Sonipat Town should also be considered for preparation of the DPR. This interaction was followed up by a meeting with the Municipal Committee of Panipat Town and Sonipat Town on 16.05.06 convened by the Executive Engineer at the instance of the Consultant. The meeting was attended by the President Municipal Committee of Panipat Town and Sonipat Town and PHED.

The President Municipal Committee and the municipal engineer of Panipat Town and Sonipat town gave their concurrence to the above-mentioned listed areas for execution of the project on priority bases. A map of Panipat Town showing priority areas is enclosed in Drawing No-2006037/EE/IR-01.



Immediately after the meeting, the consultants mobilized for commencement of survey work for the above-mentioned priorities areas for Panipat Town and Sonipat Town. The detailed field survey has been commenced on 26.05.06. Simultaneously other data pertinent to the preparation of the DPR are been collected and analyzed by the consultant.

Letters have also been addressed to the Municipal bodies for identification of technical personal to get association with the work being done by the Consultants as part of the training for skill improvement. But so far no response has been received from the municipal body.

### **Office Furnishing:**

As approved by PHED the following item furniture have been supplied, inspected and accommodated in the office.

<b>Sl. No</b>	<b>Description</b>	<b>Number</b>
1	Table (3ft X 5ft)	2
2	Table (2 ½ ft X 4ft)	6
3	Revolving Chair	2
4	Office Chair	13
5	PVC Molded Chair	1
6	Steel Filing Rack	2
7	Desert Cooler	1

Required furnishing items like Curtains, Tube lights, Fan, Desert Cooler, Power Points and Switches etc have already been executed the latter to facilitate installation, testing & commissioning of equipments. Office furnishing will continue further as per requirement and all the this office equipment will be commissioned in term of facilitate smooth functioning of the project.

### **Office Equipment:**

As per approved list and specifications the following equipment have been supplied and installed and loaded with back up software as per specifications.

<b>Sl. No</b>	<b>Description</b>	<b>Number</b>
1	Computer	3
2	Photocopier	1
3	Fax Machine	1

### **Sanitary condition in PANIPAT TOWN.**

Before YAP-I only 29km length sewer line of sizes varying from 200mm to 760mm diameter was in existence in the town. The entire sewage / sullage from the town was being pumped to drain no. 2 through two existing sewage pumping stations, one located at the old



town and the other at Model Town. From drain no. 2 sewage / sullage reaches Western Yamuna Canal through Panipat drain.

In YAP-I 23.53km of sewer line varying from 250mm to 1800mm diameter for intercepting and diverting the flow from existing Nallas / Drains earlier discharging to into Panipat Drains was laid. Besides, one Intermediate Pumping Station and two Main Pumping Stations were constructed. The town has been divided into two sewerage zones. Sewage treatment plants, based on UASB, technology of capacities 10Mld and 35Mld have been constructed in Zone I and Zone II respectively.

Presently, only 35 to 40% of the town is covered with the sewerage system and untreated sewage from the unsewered areas is finding its way into the river Yamuna.

### **Sanitary Condition in SONIPAT TOWN.**

Under YAP-I, 12.06km of sewer line of size varying between 400mm to 1675mm diameter for interception and diversion of sewage flow from Nallas / Drains earlier discharging to drain no. 6 were laid. Besides, one Intermediate Pumping Station and one Main Pumping Station along with rising main of 600mm diameter for a 500m length were constructed.

Intercepted and diverted sewage is ultimately treated at the 30Mld sewage treatment plant based on UASB technology located near Rath Dhana village. Treated effluent is discharged to the River Yamuna.

About 45 to 50% of the town is covered by the sewerage system. Untreated sewage from the balance area finds its way to the River Yamuna.



### 1.5.2.3. FARIDABAD AND GURGAON

The Consultant has undertaken the following activities for Faridabad and Gurgaon Towns.

M/s Consulting Engineer Services (I) Pvt Ltd met PHED officials immediately after mobilization and requested the Executive Engineer Faridabad to hand over the premises for setting up the office. Office space was provided by PHED at the 45 MLD STP premises at Faridabad. The office has since been furnished with the complete list of approved furniture and specified equipment for immediate functioning. The Executive Engineer has provided the DPR, Plans and whatsoever data available in his office duly supported by full cooperation of his staff for Faridabad town. The data requested for Faridabad Town are as below.

- Complete list and information on line agencies
- Base maps
- Land use / development master plans, area development plans
- Details of on-going and planned development programmes
- Reports for already identified projects
- Physical and functional data on existing sewerage system
- Sub-soil characteristics
- Water supply status including user habits
- Demographic data
- Prevailing Laws and By Laws and regulatory provisions and practices
- Schedule of rates

Till date the following information/documents have been received for both the towns.

1. Project Report of the Existing Sewerage system
2. Project Report prepared by PHED officials for the work to be undertaken under YAP-II.
3. Key plan of Faridabad Town
4. Census/Population data.
5. Schedule of rate
6. Ward wise drawing
7. Design Criteria followed by PHED for sewer lines.
8. Ward wise population

Initially for Faridabad Town the following areas for preparation of DPR for YAP-II are as follows.

<b>For Faridabad Town</b>
1. Sanjay Colony Part I & II
2. Sanjay Colony Part II
3. Jawhar and Dhabua Colony
4. Sanjay Ghandhi Memorial Nagar Sector 48



Accordingly engineers of Consultant's Team started visiting the sites and conducted reconnaissance survey. Simultaneously the data provided by the PHED was reviewed and was observed that the list of works was too exhaustive to be accommodated within the available fund as also within the scope of services of consultants. As was decided in the start up meeting held on 9<sup>th</sup> May 2006, some areas were prioritized on the basis of the long list provided and supported by interaction and discussion with the Executive Engineer for taking up activities by consultants to achieve reimbursement of about Rs 1.5 to Rs 2.0 Crores within the current financial year.

It was also indicated by the EE that the areas adjoining the above mentioned priorities areas for Faridabad should also be considered for preparation of the DPR. This interaction was followed by a meeting with the Engineers of the Municipal Corporation of Faridabad Town convened by the Executive Engineer at the instance of the Consultant. The meeting was attended by the two Executive Engineers of Municipal Corporation of Faridabad Town and PHED, and an intensive interaction for two days considering various options was discussed at length before finalizing the prioritized list for which the necessary detailed drawings were also made available by the Municipal Corporation Engineers.

The areas finalized for Faridabad in order of Priority for the Phase I mini DPR are as below.

<b>For Faridabad Town</b>
1. Ward no 3 & 4 of Sanjay Colony Part I & II
2. Ward No 7 of Sanjay Enclave area

In spite of all efforts made by the consultants to commence survey work as planned on 18.05.06, the designated survey team has not yet been able to commence work at site only on 29.05.06 due to logistic problems. The consultants however, are keen to make good the time lag and ensure that the DPR is prepared by the targeted date.

In line with the other towns the Team Leader and Project Engineer interacted with Executive Engineer and his team at Gurgaon to prioritise the work for Phase-I mini DPR. However, due to more urgent preoccupations, it has taken some more time to get the prioritized list of areas to be taken up for Phase-I. Interaction and field visit for the same is in progress as of now.

Letters have also been addressed to the Municipal bodies for identification of technical personal to get association with the work being done by the Consultants as part of the training for skill improvement. But so far no response has been received from the municipal body.

#### **Office Furnishing:**

As approved by PHED the following item furniture have been supplied, inspected and accommodated in the office.



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Sl. No	Description	Number
1	Table (3ft X 5ft)	1
2	Table (2 ½ ft X 4ft)	3
3	Revolving Chair	1
4	Office Chair	6
5	Steel Filing Rack	1
6	Stool for office boy	1
7	Desert Cooler	1

Required furnishing items like Tube lights, Fan, Desert Cooler, Power Points and Switches etc have already been installed the latter to facilitate installation, testing & commissioning of equipments. Office furnishing will continue further as per requirement so that smooth functioning of the office is not hampered.

#### **Office Equipment:**

As per approved list and specifications the following equipment have been supplied and installed and loaded with back up software as per specifications.

Sl. No	Description	Number
1	Computer	3
2	Photocopier	1
3	Fax Machine	1

#### **Sanitary Condition in FARIDABAD TOWN**

Before YAP-I, majority of the town falling under the new industrial township area was covered by the sewage collection system. Raw sewage from this area was being pumped into storm water drains which was ultimately carried through Gaunchi drain to the river Yamuna. Sewage from the eastern side of Delhi-Mathura road, i.e. from HUDA and old Faridabad areas was being pumped to an oxidation pond. Due to overloading of the oxidation pond, the system is not operational. Part of the effluent was being used for agriculture and the balance was being discharged to the Gurgaon canal.

Faridabad town was originally divided into three zones. Zone III has further expanded and a number of HUDA industrial sectors have come up. From the planning perspective a fourth zone was carved out of the Zone III. There are two major drains Gaunchi drain and Buriya Nalla running through the town. These drains / Nallas carry the wastewater generated in the town and ultimately discharges into the river Yamuna.

Under YAP-I, 23.6km of intercepting sewers was laid. Four pumping stations along with 2km of rising mains were constructed. Besides, replacement of pump sets in 5 existing pumping stations was also carried out. Three sewage treatment plants (STPs) in zones I, II and III of capacities 20Mld, 45Mld and 50Mld respectively were constructed. All the above STPs were constructed based on UASB technology. Presently, 60% of the town is covered with sewerage system.



The untreated wastewater from unsewered areas find way into two drains flowing through the town. In slum areas septic tanks with soakage pits exist.

Wastewater from industries is treated in individual effluent treatment plants of industries before being discharged into domestic sewers.

### **Sanitary Condition in GURGAON TOWN**

Before YAP-I, the town was partly sewered. As there are no major industries existing in Gurgaon, wastewater generation was very less. Domestic wastewater was being collected through trunk sewers to a disposal point near the railway line to the west of the town. Untreated sewage was being partially used for farming while the surplus was flowing to Najafgarh drain and then to Yamuna river.

Under YAP-I, a sewage treatment plant based on UASB technology of 30Mld capacity was constructed. The wastewater is collected through two trunk sewers. HUDA has its own sewage treatment plant. 63Mld of wastewater is treated in this plant and the balance discharges into the trunk sewers of Gurgaon for treatment. 26.61km of sewers of varying size 250mm to 1000mm diameter was laid, one main pumping station and one intermediate pumping station along with 700m of rising main were also constructed under YAP-I.

Treated wastewater is discharged into Najafgarh drain through unlined open channels. The untreated wastewater also flows into Najafgarh drain through network of smaller drains. All these ultimately lead to Yamuna river.

#### **1.5.2.4. STATUS OF ACTIVITIES UNDERTAKEN AS PER PROPOSED APPROACH AND METHODOLOGY**

As per proposed Approach and Methodology, the status of activities to be undertaken in six towns (Yamunanagar-Jagadhri, Karnal, Panipat, Sonipat, Faridabad and Gurgaon) is as follows.

Sl.No	Proposed Task Series	Proposed Main Task	Activities to be undertaken	Activities Performed in six towns as per approach and methodology.
1.	Assignment Management	Manage and Co-ordinate the Assignment	Mobilization of the proposed team.	Complied.
			Operational Planning.	Complied.
			Travel Planning.	Complied.
			Accommodation arrangements.	Complied.
			Furnishing	Complied.
			Establishment of assignment management arrangements including office running equipment	Partial.
			Office set up	Complied.
			Assignment budgets	Complied.
			Reporting procedures	Complied.
			Communication arrangements	Under Process.
			Cash flow requirements	Partially Complied.
			Banking facilities	Complied.
			Briefing of the Team Leader and the team members	Complied.



			as appropriate based on the background studies undertaken for this proposal and relevant issues, addressed during the contract negotiations.	
			The Consultants, through their offices at Panipat, Yamunanagar, Faridabad and Gurgaon will commence discussion with PWD-PHED Office in relation to the counterpart facilities to be provided in readiness for the mobilization of the Project Team.	Complied.
			Manage the Assignment for its completion in due time	Complied.
			Review sub assignment components programme for their completion and take proactive corrective actions to avoid any undue delay.	Complied.
			Introduce, Coordinate and liaison with PIA, PMC, Steering Committee, Working Committee and others, as required.	Complied.
		Establish Computer Facilities	Install a network of computers to cater to the need of the project	Partially Complied.
			Softwares STAAD Pro 2001, AutoCAD Map 2000, AutoCAD 2004, SewerCAD5, MS Project 2000/ Primavera, MSOffice, etc. are envisaged to be installed. Procurement of the above will be finalized in consultation with PIA.	Partially Complied.
		Assistance to Working Committee (WC) / PMC	Assist WC by providing data and clarifications in managing the project including preparing project progress reports and completion report.	Ongoing.
			Assistance to PMC by providing data, surveys, technical and contractual clarifications, etc. as required.	Ongoing.
			Assist PIA by providing all technical and contractual clarifications, back ups as required.	Ongoing
		Scheduling and Monitoring	Prepare comprehensive implementation schedule for the assignment and update on monthly basis	Ongoing
			Review sub assignment components programme for their completion and take proactive corrective actions to avoid any undue delay.	Ongoing
	DATA COLLECTION	Reconnaissance survey and review of available data	Relevant previous studies and reports	Complied.
			Plans and maps of existing and planned facilities	Collected.
			Details of current plans and programmes relevant to this project	Collected.
		Collection of Available Drawings, Plans, Reports & Data	Complete list and information on line agencies	Ongoing.
			Base maps	Collected.
			Land use / development master plans, area development plans	Collected.
			Details of on-going and planned development programmes	Collected.
			Reports for already identified projects	Collected.
			Physical and functional data on existing sewerage system	Ongoing.
			Sub-soil characteristics	Ongoing.
			Water supply status including user habits	Complied.
			Demographic data	Complied.
			Prevailing Laws and By Laws and regulatory provisions and practices	Not Complied.



			Construction materials and market prices	Ongoing.
			Schedule of rates	Collected.
		Review of Data and identification of data gaps		Ongoing.
		Collection of Additional Data		Ongoing.
		Data Management		Ongoing.

### **Problem/Hindrances encountered:**

Resource limitations, especially on availability of the professionals locally had caused some delay in placement of supporting staff. Another major hindrance, which was brought to the notice of the PHED, is the limited fund provided in the contract for movement of personnel. It is essential to have four vehicles for effective coordination and monitoring. Notwithstanding the above the consultants are deploying four vehicles to ensure smooth functioning of the project. Another major drawback is communication facilities. Obtaining a land line Telephone facility in the three project office is posing problems and all communication as present are being done by purchasing six mobile phones which have not been allowed in the contract.

In Panipat during the course of discussion with EE in charge, CES officials pointed out that there is acute power problem at the space provided for the office set up ie 10 MLD STP. Due to this problem no effective work could be done for two weeks. It was further mentioned that the existing telephone line was not functional due to reported theft of cable. To restore the telephone line CES deposited Rs 814 to the BSNL authority but the line had not been restored. Consequently normal functioning of the office work was affected.

Following the decision taken in the meeting at Panchkula on 09.05.06, for shifting of office premises to 35 MLD STP plant from 10 MLD STP plant, action had been taken on 10.05.06 and subsequently all furnishings were transferred and office reestablished by 12.05.06. However it has been observed that power availability at 35 MLD STP plant is also erratic and once again the telephone communication facility is not available. Consequently, normal functioning of the office is affected. To resume the service in regard to power and communication considerable time is required. CES has requested PHED to extend their help to get rid of the aforesaid problem.

The efforts of the Consultant to obtain adequate information about the projected areas to be taken up for the mini DPR in Gurgaon and duly prioritize them in consultation with the municipal authorities has not been possible. However, the consultants to some extent have been able to identify areas as provided in the DPR by personal intervention of the Team Leader of the consultant who was himself present for the site reconnaissance. Work, however, is going on to finalize the priority list of work for Phase-I.

### **Movement of Team Leader**



A request for provision of a fourth vehicle for the project to facilitate movement of the Team Leader for the six towns and keep in touch with the field work as well as attend meetings at Delhi, the project offices and Panchkula, the consultant has to engage a separate vehicle for the Team Leader so that the effective functioning of the Project Engineers is not affected. But the request was not accepted. The consultants were advised to accommodate the short coming on the ground that during the later part of the project the need for independent vehicle by the three project engineer would get reduced but payment for three vehicles has been provided for.

## **1.6. PROJECT INITIATION MEETINGS AND LIAISON WITH STAKEHOLDERS**

Consultants assignment involves a member of Key Stakeholders besides themselves as listed below.

- Govt of India, represented by National River Conservation Directorate (NRCD), the executing agency
- Govt of Haryana, represented by PWD PH Branch, the PIA.
- Japan Bank of International Corporation, the funding agency
- Urban Local Bodies in the 6 towns
- Project Management Consultants (PMC) engaged by NRCD to assist them in managing and monitoring the YAP function.
- Consultants for the Reform Action Plan
- Consultant for preparation of DPR for 8 towns in Haryana

While, CES is likely to have only limited interaction with JBIC, NRCD will monitor the functioning of CES closely through PMC. PMC will also monitor and facilitate coordination among various stakeholders concerned. Further, PMC will assist PIA in technical and contractual aspects involving all consultants. CES will have intensive interaction on a continuous basis with the officials of ULBs and with the counterpart officials of PWD PH Branch in project towns.

The consultants for preparation of RAP and for preparation of DPR considering the Master plan will have overlapping functions in the same project area as that of CES and interaction, as required, will be carried out primarily for exchange of technical data, information, proposal and suggestion.

The interaction sessions organized so far where CES participated are as follows:

- Presentation by CES at Chandigarh where senior representatives of JBIC, NRCD, Govt of Haryana PWD Ph Branch, ULBs and PMC participated
- A seminar organized by PMC at Delhi where representative of JBIC, PWD- PH Branch, ULBs, PMC and consultants for preparation of RAP participated
- A coordination meeting organized by PMC at their office where representative of PMC, consultants for preparation of RAP and consultants for preparation of DPR participated.



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### 1.6.1. START UP MEETING

A start up meeting was organized by the Engineer-in-Chief, PWD PH Branch Haryana at their Head Office in Panchkula on May 09, 2006, for discussion on the following agenda items.

1. Finalization of Scope of Work in all six towns
2. Procedure for coordination between various agencies
3. Identification of Local Assistant Engineers and Junior Engineers
4. Hindrances
5. Billing Procedure
6. Approval of Proposals
7. Any relevant issue

The meeting commenced with the introduction of the Professionals of CES, PWD PH Branch and PMC. Following are the decision taken up by the PWD PH Branch Haryana to ensure smooth and quick functioning of the project: (a copy of the Minutes of Meeting is attached in annexure as Annexure No 1).

1. The Executive Engineer (XEN) of the respective towns will be the nodal officers for technical issues.
2. Any matter that cannot be resolved at the XEN level will be referred to the Chief Engineer.
3. The total tendering work is to be restricted to the total contractual value of about Rs 35 Crore, covering all six towns restricting the total length of sewer lines to 100 Km as per contract.
4. After identifying the priority stretches from the four executive engineers for the six towns mini DPRs are proposed to be prepared and submitted to the XEN totaling to about Rs 8 Crores to Rs 10 Crores as phase I of YAP-II executing totaling for which is projected to be completed within the current financial year.

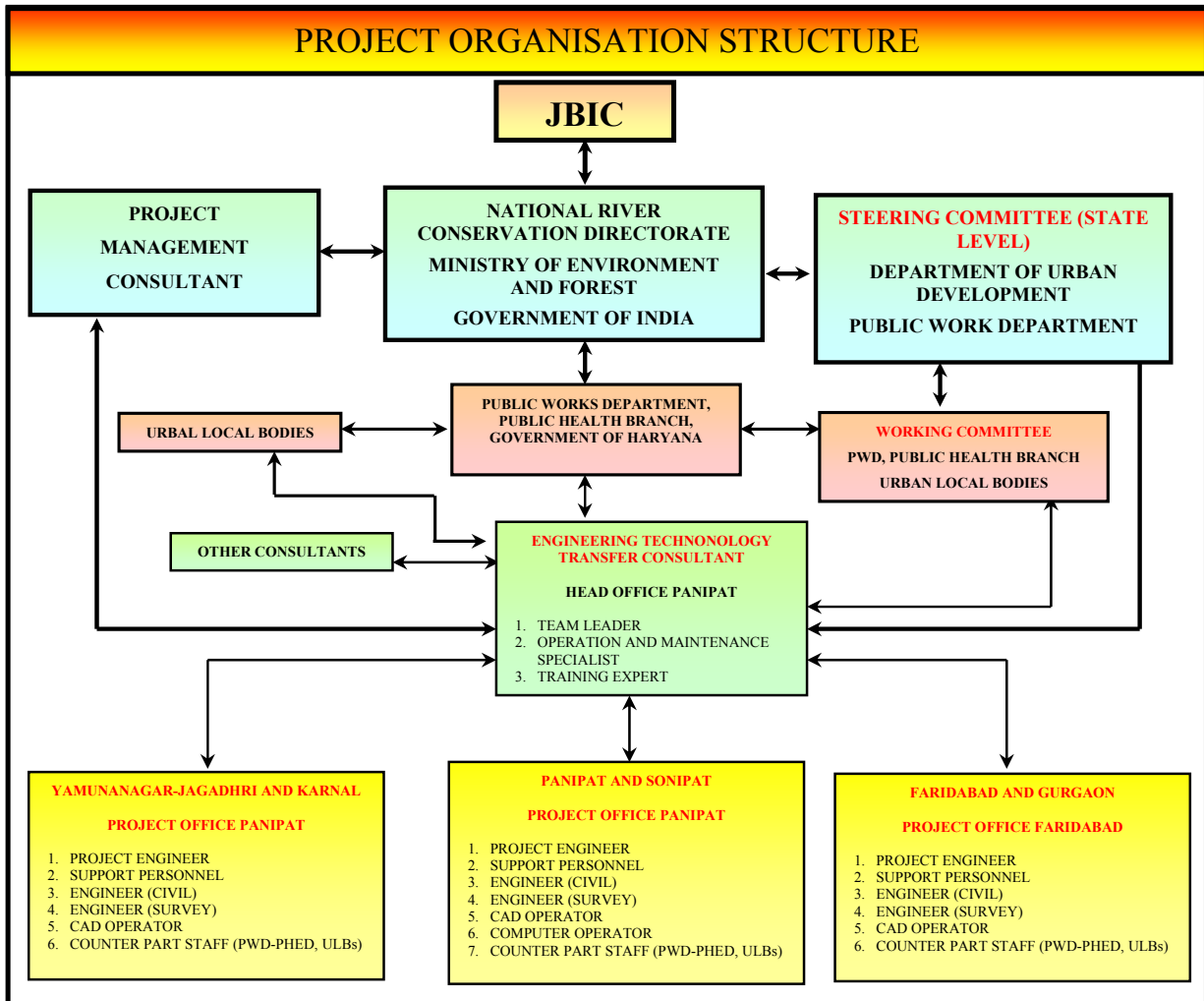
As an outcome of the decision taken in the Start up Meeting on 9<sup>th</sup> May, 2006, the work for preparation of DPR has got divided into two parts to be addressed at successive periods of the work cycle. Consequently the deployment of Project Engineer at Panipat, the controlling office of the project necessary required to be increased as demanded by the work.



## 2. PROJECT MANAGEMENT AND SCHEDULING

### 2.1. ORGANIZATION AND COMMUNICATIONS

The stakeholders of the project with whom the Consultant must maintain close coordination and interaction are listed below and the linkages are shown schematically in **Figure Below**.



Government of Haryana, the Public Works Department (PWD) - Public Health Branch is the administrative agency of the project and to which the Consultants for the project will be responsible. A two-tier project management framework – a Steering Committee and a Working Committee – will monitor the project functions. These committees will have representatives drawn from the Urban Development Department, PWD and Urban Local Bodies (ULBs).



The interrelationship among the above agencies for implementation of the project along with the Consultants own team organization has been presented diagrammatically in the above Figure.

The Team Leader of CES and other key professionals of the team have the most relevant experience to suit the project needs. Only the best services in tune with the motto of the consultant that is to render quality service in a professional manner and in fullest co-operation with Project Implementing Authorities (PIAs) and other stakeholders will, therefore, be offered.

The Project Management Consultants (PMC) will support the PWD - Public Health Branch and will also receive guidance from the National River Conservation Directorate (NRCD), Ministry of Environment and Forest, Government of India and the Japan Bank of International Cooperation. The Consultants will function in close coordination, interaction and also with guidance of the Project Management Consultants. Consultants Project Team will also have close interaction with the ULBs and with other consultants engaged in the YAP-II projects with parallel operation.

Consultants project team is headed by the Project Manager/Team Leader stationed at Project Central Office in Panipat, where the Team Leader and one Project Engineer along with Core Team Members are located. Two other field project offices are located at Faridabad and Yamunanagar respectively, each to be headed by one Project Engineer and supported by field staff.

The Project Engineer at Panipat will look after works in Panipat and Sonapat, while works in Karnal and Yamunanagar will be the responsibility of Project Engineer at Yamunanagar. Works in Gurgaon and Faridabad will be the responsibility of Project Engineer to be stationed at Faridabad.

For smooth functioning of the project, Project Manager/Team Leader along with Core team member has been accommodated at Panipat. Two other Project Engineers are accommodated at Yamunanagar and Faridabad respectively. For carrying out the activities in each town and for interaction, coordination and site visit by the consultant and stakeholders, three Cars (Tata Indica) has been hired at respective project offices. In addition a separate which has been engaged for the team leader for independent movement of the head office and for coordinating wit the four Executive Engineer, PMC and Chief engineer office at Panchkula.

## 2.2. REVISED WORK PROGRAM SCHEDULE

For carrying out the assignment after assessing the present site situation the work methodology has been divided into various Tasks (main tasks and sub-tasks) to be performed to address all the components of the project. A Work Plan has been drawn up incorporating all the identified activities/tasks and considering their inter-relationship and timing sequence, taking into account the modifications required consequent to the decision taken for phased implementation in the **Start Up Meeting**.

The work plan is shown in the Activity (Bar) Chart (Enclosed as Fig No 1).



The specific responsibility of each of the Consultants' team (key) members is shown in a Responsibility Matrix (Enclosed as Fig No 2). This also indicates which member will hold the primary responsibility to accomplish a particular task. The matrix also indicates the other team member(s) who have inputs for a particular task (termed as joint/secondary responsibility/specialist input, etc.) to assist the person holding primarily responsible.

The deployment schedule of each of the key professionals is shown in a Manning Schedule (Refer to the Manning Schedule (Enclosed as Fig no. 3). This schedule indicates the estimated duration and input timing of each professional.

A Project Office has been set up at each of the three Project towns – Yamunanagar (25 MLD STP), Panipat (35 MLD STP) and Faridabad (45 MLD STP). Selection of towns for project site offices has been made based upon discussions with local officials of PHED in the Project Towns.

The Team Leader and other key staff are operating from the office located at Panipat. Panipat being almost at the mid-location considering the spread of the project towns has been preferred as the main Project Office for the Team Leader. The selected location provides greater flexibility to the Team Leader to liaison with the PHED/PMC and to supervise project works. All the activities of the project – assignment management, conducting surveys, scheme formulation, designing, detailing, procurement assistance services, project supervision & monitoring monitor are being done from this Project Office. The project deliverables are prepared from this office.

All design and field related activities would be carried out from the respective Project Offices at Panipat, Yamunanagar and Faridabad.

### **2.3. ABILITY TO MEET THE SCHEDULE**

Successful completion of the project will be dependent on the development of a very close interaction with NRCD, JBIC, and State Government/PIAs officials and staff, thus facilitating rapid reviews and timely decision-making.

The consulting team consists of a number of specialists who will be present in project offices for specific periods of intense input into the project. It will be necessary to provide quick and efficient access for these specialists to all stakeholders, particularly during those times when critical decisions are to be taken.

### **2.4. STAFFING**

The success of a project is predominantly dependent on the quality of the individual professionals assigned to the team. The Consultants combine has unique advantage of working in the recent past in different projects particularly for urban infrastructure development funded by various international funding agencies.



Accordingly the team member in position are eminently suitable to meet the specific requirements of the project and have been selectively chosen for this assignment and similar urban services/environmental improvement related projects. They have worked both in India and abroad for projects funded by different multi-national agencies.

Mr. Subrata Gupta, Team Leader designate, heads the team proposed for this project. Mr. Gupta, a Post-Graduate in Public Health Engineering, has 35 years extensive and varied experience in urban infrastructure projects in various parts of India. He has guided and led project teams in carrying out system planning, formulation of scheme, detailed design tender documentation, project administration and co-ordination, contract management, quality assurance and control. His vast experience and exposure in successfully managing multi-disciplinary teams in various infrastructural development projects with particular reference to his recent involvement as the DSC-Team Leader for Karnataka Urban & Coastal Environmental Management Project (ADB funded) will be of great value and importance to the project.

Mr. Gupta will be assisted by the two three Core Team Experts, i.e. Mr. T. K. Rakshit the Project Engineer 1 designate, S Choudhury the Project Engineer 2 designate and Mr. R K Sharma the Project Engineer 3 designate. All of them have long working experience in similar assignments in different locations and are well known and reputed specialists in their respective fields of specialization.

Other key experts include the Operation & Maintenance Specialist, Mr. A P Gupta and the Training Expert, Mr. J C Yadav, who have rendered excellent service in a number of projects of similar nature. The Team Leader will be supported by a group of engineers, conversant with the local conditions, on topographical survey, hydraulic and structural design, procurement, electrical – mechanical works, construction management, quantity surveying, etc.

The Consultants have also engaged a few support staff, qualified and trained in house to fulfill the objective of generating quality deliverables due to the limitation of availability of such professionals duly qualified and trained from local sources.

The consultant force is deployed for the project which will ensure a high quality and standard of work and timely execution of the project.

## **2.5. MONITORING**

The Schedule of Activities for the project has been developed in the form of a bar chart with time allocations and sequences. This chart will be updated from time to time as appropriate and will be used on a regular (monthly) basis to track progress and identify problems, thereby enabling appropriate action during the life of the project. Periodic Progress Reports will be submitted highlighting progress status achievements, constraints and bottlenecks as also remedial measures for effective monitoring.



### 3. APPROACH AND METHODOLOGY

#### 3.1.1. APPROACH

The overall approach for the project is aimed to generate deliverables and render services of the highest order utilizing State of the Art technologies and latest tools and software compatible to local conditions. The project would require multi-agency participation in the delivery process. One of the key components identified is to ensure excellent co-ordination and constant interaction among all concerned and extending assistance to other agencies involved in the process. It will be the endeavour of all members of the team to act as a composite entity amongst themselves and with the Project Implementing Authority (PIA), Working Committee and Steering Committee. The methodology has been developed in accordance with scope finalized through negotiation and subsequent modifications as per decisions in the Start Up Meeting.

#### 3.1.2. METHODOLOGY

##### 3.1.2.1. GENERAL

After mobilization, the Consultants has several interactions with the officials of the PHED and ULBs and made site visits to the project towns, to PWD-PH branch to study the project areas. This has enhanced our appreciation of the pertinent key issues while developing this methodology. The prevailing scenario in these sectors is illustrated in the sub section Site situation Analysis. To address amply the assignment requirements, the Consultants have developed a set of activities interconnecting a series of major tasks. Such major tasks which are to be carried out in both Phase I and Phase II.

Task Series	Task Description
3.2.4.2.1	Assignment Management
3.2.4.2.2	Data Collection
3.2.4.2.3	Update Already Prepared Schemes/DPRs
3.2.4.2.4	Survey and Investigation
3.2.4.2.5	Detailed Engineering Design
3.2.4.2.6	Procurement Services
3.2.4.2.7	Contract Administration, Construction Supervision & Quality Assurance
3.2.4.2.8	Project Completion Processing
3.2.4.2.9	Conduct Training
3.2.4.2.10	Reporting

These major tasks have been further sub-divided into tasks and sub-tasks. The major task series and tasks are graphically presented through a flow chart for elucidation through sequencing of various tasks. The headings of the tasks are



self-explanatory. In certain cases, these have been further elaborated in this section for better appreciation of the methodology being proposed by the Consultants.

### **3.1.2.2. TASK SERIES**

#### **3.2.4.2.1 ASSIGNMENT MANAGEMENT**

##### **MAIN TASKS**

- A 1.0 : Manage and Coordinate the Assignment
- A 2.0 : Assistance to Working Committee (WC) / PMC
- A 3.0 : Scheduling and monitoring
- A 4.0 : Supply and installation of Equipment and Furniture

#### **3.2.4.2.2 DATA COLLECTION**

##### **MAIN TASKS**

- B 1.0 : Collection of Available Drawings, Plans, Reports & Data
- B 2.0 : Reconnaissance Survey and review of available data
- B 3.0 : Analysis of Data and Identification of Data Gaps
- B 4.0 : Collection of additional data
- B 5.0 : Data Management

#### **3.2.4.2.3 UPDATE ALREADY PREPARED SCHEMES/DPRs**

##### **MAIN TASKS**

- C 1.0 : Review of Reports
- C 2.0 : Review of Current Management Practices
- C 3.0 : Establishment of Design Criteria
- C 4.0 : Review of Population Projection
- C 5.0 : Updating / Revision of Reports / Schemes

#### **3.2.4.2.4 SURVEY AND INVESTIGATION**

##### **MAIN TASKS**

- D 1.0 : Update Base Map
- D 2.0 : Organise and conduct various survey
- D 3.0 : Geo-technical Investigation
- D 4.0 : Cost Survey

#### **3.2.4.2.5 DETAILED ENGINEERING DESIGN**

##### **MAIN TASKS**

- E 1.0 : Engineering Design

#### **3.2.4.2.6 PROCUREMENT SERVICES**

##### **MAIN TASKS**

- F 1.0 : Prepare Bid Documents
- F 2.0 : Evaluate Bid documents
- F 3.0 : Assist PIA in Bidding Process
- F 4.0 : Award of work to the successful Contractor



#### 3.2.4.2.7 CONTRACT ADMINISTRATION, CONSTRUCTION SUPERVISION & QUALITY ASSURANCE

##### MAIN TASKS

- G 1.0 : Assistance in fulfillment of owners obligation
- G 2.0 : Supervise construction of project components
- G 3.0 : Ensure adequate safety and environmental requirements
- G 4.0 : Assist completion of works

#### 3.2.4.2.8 PROJECT COMPLETION PROCESSING

##### MAIN TASKS

- H 1.0 : Finalise 'As Built' Drawings
- H 2.0 : Preparation of Operation and Maintenance Manual
- H 3.0 : Preparation of Supervision Manual
- H 4.0 : Preparation of Completion Report

#### 3.2.4.2.9 CONDUCT TRAINING

##### MAIN TASKS

- I 1.0 : Prepare Training Module and Training Material
- I 2.0 : Conduct Training

#### 3.2.4.2.10 REPORTING

##### MAIN TASKS

- J 1.0 : Preparation and submission of reports.

The main task series are described below:

### 3.1.2.2.1. ASSIGNMENT MANAGEMENT

#### MAIN TASK

##### A 1.0 Manage and Co-ordinate the Assignment

A 1.1 The Project Team has mobilized within the required time frame. Initial activities commenced by the consultant are as follows:

- Operational planning, Travel planning and accommodation arrangements and furnishing
- Establishment of assignment management arrangements including office running equipment, office set up, assignment budgets, reporting procedures, communication arrangement, insurance requirements, quality assurance plan, record systems, financial reporting arrangements, cash flow requirements, banking facilities, etc.
- Briefing of the Team Leader and the team members as appropriate based on the background studies undertaken for this proposal and relevant issues, addressed during the contract negotiations. The Consultants, through their offices at Panipat, Yamunanagar and Faridabad will commence discussion with PWD-



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PHED Office in relation to the counterpart facilities to be provided in readiness for the mobilization of the Project Team.

- A 1.2 Manage the Assignment for its completion in due time
- A 1.3 Review sub assignment components programme for their completion and take proactive corrective actions to avoid any undue delay.
- A 1.4 Coordinate and liaison with PIA, PMC, Steering Committee, Working Committee and others, as required.

**Output:** *Mobilization completed and assignment management system established.*

**Responsibility Distribution:** *Overall responsibility of this task for assignment management is vested with the Team Leader supported by core team members.*

#### **MAIN TASK**

##### **A 2.0 Assistance to Working Committee (WC) / PMC**

- A 2.1 Assist WC by providing data and clarifications in managing the project including preparing project progress reports and completion report.
- A 2.2 Assistance to PMC by providing data, surveys, technical and contractual clarifications, etc. as required.
- A 2.3 Assist PIA by providing all technical and contractual clarifications, back ups as required.

**Output:** *Assistance extended to WC / PMC / PIA.*

**Responsibility Distribution :** *The Team Leader and Project Engineer will have primary responsibility., O&M Expert and Training Expert will have secondary responsibilities.*

#### **MAIN TASK**

##### **A 3.0 Scheduling and Monitoring**

- A 3.1 Prepare comprehensive implementation schedule for the assignment and update on monthly basis
- A 3.2 Review sub assignment components programme for their completion and take proactive corrective actions to avoid any undue delay.

**Output:** *Assignment schedule prepared and monitored.*

**Responsibility Distribution:** *The Team Leader will have primary responsibility.*

#### **MAIN TASK**

##### **4.0 Supply and installation of Equipment and furniture**

- A 4.1 Install a network of computers to cater to the need of the project
- A 4.2 Supply and positioning of Furniture had been done as per approved specification at respective project office.

**Output:** *IT setup established and furniture are positioned.*



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**Responsibility Distribution:** *Overall responsibility of this task rests with the Team Leader supported by concerned team members.*

### 3.1.2.2.2. DATA COLLECTION

#### MAIN TASK

##### B 1.0 Collection of Available Drawings, Plans, Reports & Data

The Consultants had arranged to collect data / information required to perform their duties under Phase I and will collect relevant data /information required to perform duties under Phase II. The list of data collected for Phase II would broadly include the following:

- Complete list and information on line agencies
- Land use / development master plans, area development plans
- Details of on-going and planned development programmes
- Reports for already identified projects
- Physical and functional data on existing sewerage system
- Sub-soil characteristics
- Water supply status including user habits
- Demographic data

**Output:** *Secondary data collected and collated for all the towns except Gurgaon. Follow up action in process to complete the same for Gurgaon.*

**Responsibility Distribution:** *Experts of individual sectors will have primary responsibility and Team Leader will have secondary responsibility.*

#### MAIN TASK

##### B 2.0 Reconnaissance survey and review of available data

Significant amounts of data have been collected under Phase I. These are been reviewed and additional relevant documents are collected and also reviewed for Phase I. A list of data, documents been collected by the consultant is listed under the heading Situation analysis of this inception report:

Basic data collection for Phase I was exhaustive but provide a starting point for the initial core team to familiarize themselves with the situation. The professionals had collected additional detailed data relevant to their own specific responsibilities.

A reconnaissance survey of the project area had been undertaken jointly with the PIA as an opportunity for rapid familiarization of key features and existing environmental conditions. This had provided an opportunity for the Executing Agency to provide its views in a field environment.



For Phase II, necessary data will be collected after completion of Phase I. These will be reviewed and additional key documents will be collected and also reviewed. The data will include:

- Relevant previous studies and reports as well as interrelationship with Phase I,
- Plans and maps of existing and planned facilities;
- Details of current plans and programmes relevant to this project;

A reconnaissance survey of the project area under Phase II will be undertaken jointly with the PIA to provide an opportunity for rapid familiarization of key features and existing environmental conditions. This will also provide an opportunity for the Executing Agency to provide its views in a field environment.

***Output:** Reconnaissance survey is completed and available data recorded has recorder for Phase I.*

***Responsibility Distribution :** Project Engineer will have primary responsibilities for collection of data, reports and reconnaissance surveys.*

## **MAIN TASK**

### **B 3.0 Analysis of Data and identification of data gaps**

Consultants is examining and analyzing the available data to identifying the data deficiencies for Phase I so that the additional data to fill in the gaps can be fully collection to prepare a comprehensive mini DPR for Phase I. The same activity will have to be done for Phase II.

***Responsibility Distribution:** Experts of individual sectors have primary responsibility and Team Leader have secondary responsibility.*

## **MAIN TASK**

### **B 4.0 Collection of Additional Data**

The collection of missing links identified under Main Task B 3.0 is under process for Phase I with the assistance from PWD. The same activity will have to be done for Phase II.

***Output:** All available additional data collected, reviewed and requirement for collection of primary data through survey established.*

***Responsibility Distribution:** Experts of individual sectors will have primary responsibility and Team Leader will have secondary responsibility.*



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## MAIN TASK

### B 5.0 Data Management

The Consultant's Quality Assurance Procedures is under the process of customization for this project. The system comprise of data collection, check for completeness and quality, categorization, sequencing, numbering and indexing, storage and retrieval procedures. The database will be updated on regular basis by appending and adding current information for both Phases.

*Output: Data management system established and operated.*

*Responsibility Distribution: Experts of individual sectors will have primary responsibility, Team Leader will have secondary responsibility.*

### 3.1.2.2.3. UPDATE ALREADY PREPARED SCHEMES / DPRS

## MAIN TASK

### C 1.0 Review Reports

Previous key studies and reports are under review to assess level of adequacy in back up data, use of procedures, criteria, formulae, standards, software, etc for Phase I and the same activity will have to be done for Phase II.

This review will also be carried out on;

- All related other studies and reports available along with the designs as may be carried out by various departments, local bodies;
- Documents of recently concluded and ongoing current projects;
- Available plans and photographs, which might be appropriate as base plans for documenting the proposals, detailed engineering level studies;
- As-built drawings;
- Maintenance records and condition assessments;
- Urban Planning documents particularly land use and demographic information.

*Output: Reports Reviewed*

*Responsibility Distribution: Team Leader, Project Engineer will have primary responsibilities for collection of data, reports and reconnaissance surveys. O&M Expert, Mechanical and Electrical Engineers will have secondary responsibilities.*

## MAIN TASK

### C 2.0 Review current management practices

Review the current management practices for water supply, drainage and solid waste. Current management practices will be reviewed and documented under Phase II. The following key areas will be included in this review.

- Understanding of existing system with their extent of coverage



- Hydraulic operations
- Operation of pumping station
- Capacity of key system elements
- Routine maintenance procedures
- Known bottlenecks
- Impact of wet season flooding on the system.
- Recent work on investigation of existing conditions.
- Operation of treatment plants
- O&M organisation, O&M manuals, facilities, equipment, staffing, qualification of staffs and budgets.

**Output:** *Current Management Practices Reviewed*

A key issue for the study is to understand the realistic functional efficacy of the O&M staff and facilities. Review of recent documents and field visits will highlight deficiencies in this respect.

## MAIN TASK

### C 3.0 Establish Design Criteria

A set of design criteria will be established for both phases with special emphasis on per capita sewage generation, peaking factor, infiltration and inflows, pipe material, depth of flow, etc. Such criteria will be worked out following IS codes, NRCD guidelines, CPHEEO manuals and, engineering practices most relevant to the project sites.

**Output:** *Development of design norms for carrying out designs.*

**Responsibility Distribution:** *Team Leader will have primary responsibility and other experts will support him as and when required.*

## MAIN TASK

### C 4.0 Review Population Projection

From the collected demographic data, an overview of population will be carried out in compliance with the projections carried out by planning agencies like HUDA / Town & Country Planning for both the Phases. This issue will be further discussed with the PIA and planning agencies to arrive at the final projected figure and spatial distribution of the same.

## MAIN TASK

### C 5.0 Update / Revise Reports / Schemes (for Phase I and Phase II)

- C 3.1 Report prepared earlier will be updated / revised, by incorporating revised design horizon, latest site information, updated population, updated demand, etc.
- C 3.2 The updated report will include description of the scheme vis-à-vis interface with installed city system and master plan, technical merits/demerits, over alternatives, broad dimensions/plans/alignments, block cost estimate and recommendation.



- C 3.3 Preliminary surveys will be carried out to verify the proposal against physical setting and existing utilities. The Consultants experience shows that utility shifting, of major nature, may render a project unviable. Special attention will be given to inventories the utilities, which may interfere during execution.
- C 3.4 The Consultants will follow the design criteria developed. Parameters, which are not covered under such criteria, the Consultants will follow relevant Indian Codes, NRCO guidelines and CPHEEO manuals, and Consultants experience in projects of similar nature.
- C 3.5 Preliminary design will cover alignment and site layout drawings, unit sizing, hydraulic analysis, integration with the existing sewerage system, power requirement, land requirement and resettlement issues. Preliminary selection of electro-mechanical equipment and their O&M requirement will be decided. Block cost estimate will be prepared based on accepted schedule of rates/analysed market rates. Output will be submitted for review and necessary approvals. PMC will be apprised about the schemes for guidance on specific issues.

Objective of preliminary design will be to initiate advance actions on:

- Budget fixation
- Land acquisition
- Technical, administrative and financial sanction of packages
- Finalize survey and investigation requirement
- Other administrative processes, as required

**Output:** *Earlier prepared Feasibility report updated for Detailed Engineering Design.*

**Responsibility Distribution:** *Primary responsibility for this task will be with the Team Leader, Project Engineer, Mechanical/Electrical Engineers. Structural Engineer, O&M Expert, and Training Expert will support them.*

#### **3.1.2.2.4. SURVEY AND INVESTIGATION (for Phase I and Phase II)**

##### **MAIN TASK**

##### **D 1.0 Update Base Map**

- D 1.1 Collect available base maps and digitize
- D 1.2 Verify locations of utility structures and bench marks.
- D 1.3 Collation and analysis of the results of surveys and field investigation carried out under various tasks discussed elsewhere will be done. All these information will be digitized and integrated in base maps leading to preparation of comprehensive maps for the project town.

**Output:** *Updated digitized maps.*

**Responsibility Distribution:** *Relevant Core Experts will have primary responsibility and Team Leader will have secondary responsibility*



## MAIN TASK

### D 2.0 Organise and conduct various survey

#### D 2.1 Topographic survey

Prepare digitised drawings using Total Station and auto level for the following:

D 2.1a Contouring of selected sites for pumping stations by taking levels on a grid of 15m x 15m.

D 2.1b Prepare detailed alignment plan of the stretches to be constructed under this assignment by taking longitudinal section of the alignment at a maximum interval of 30 m and incorporating all physical features on both side of the alignment for a maximum width of 30 m.

D 2.1c Conduct topographic survey by fly leveling for connecting GTS bench mark for checking accuracy of any other level survey, etc.

D 2.2 Field survey related to existing sewerage system. Determine manhole top levels. Collect the following information at each existing manhole

- Incoming and outgoing sewer invert levels
- Incoming and outgoing sewer size, shape and material of construction

It is expected that PWD and ULBs will assist by opening the manholes for the consultants and operate pumping stations to keep the flow under control for carrying out the above survey. Efforts need to be made to keep manholes/drains reasonably clean by the PWD/ULBs to facilitate the above survey work.

**Output:** *Alignment details, contour plans and condition of existing system established.*

**Responsibility Distribution:** *Team Leader will have responsibility for overall management and coordination of various survey and field investigation works. Project Engineer and Engineer (Surveyor) will have primary responsibilities for formulating survey and investigation requirements, strategy and methodology to be adopted, conduct actual survey as necessary.*

## MAIN TASK

### D 3.0 Geo-technical Investigation

Geo-technical investigations for pumping stations will involve the following:

#### D 3.1 Standard penetration test for determining SBC

Carry out SPT during sub-soil exploration work to measure consistency of sub-soil stratum and also correlating it to determine angle of internal friction for sandy soils and shear strength of clayey soils. Test will be performed on borehole by penetration of standard split spoon sampler (50.8 mm outer diameter, 35 mm inner diameter) connected with standard A type drill rods. A drop hammer of weight of 65 kg falling



from a height of 75 cm will drive the sampler. Total 45cm penetration will be recorded, however, last 30cm penetration will be reported as SPT value.

#### D 3.2 Geo-tech investigation and sub-surface exploration upto 20 m depth or 3 m inside hard rock

Sink boreholes of 150mm diameter below existing ground level with the help of auger at shallow depth and afterwards with the help of shell operated by mechanical winch. Undisturbed and disturbed soil samples shall be collected at regular intervals. SPT will be conducted inside the boreholes at every 1.5m / 2m intervals. Daily water table will also be observed before and after completion of boring. Tests shall be carried out for cohesive and cohesion less soils as under:

- Natural moisture content
- Sieve and hydrometer analysis
- Atterberg's limits
- Specific gravity
- Bulk density and dry density
- Unconfined compressive strength
- Triaxial tests (unconfined undrained tests)
- Consolidation tests
- Chemical analysis of soils and water samples for pH, sulphate and chloride.

Soil exploration depth shall satisfy the following requirement:

- 20m deep or SPT value greater than 100 whichever is reached earlier, and
- if rock is encountered, depth of bore will be at least 3m inside the sound rock layer ( $RQD > 75$ ).

Necessary data from rock core to be collected for inspection of megascopic (visual) properties:

- Morphogenesis
- Dominant chemicals
- Streak
- Hardness
- Presence of  $CaCO_3$

Necessary data from rock core to be collected for laboratory tests:

- Specific gravity
- Shear strength (Compression and torsion)

#### D 3.3 Soil Investigation for Determining Corrosion Index of Soil

Determine resistivity of soil and characteristics of groundwater to predict the possible corrosivity of the soil. Also determine pH value, sulphate and chloride contents of sub-soil and ground water.

#### D 3.4 Trial Pits



Trial pits measuring 1.5 m x 1.5 m x 1.0 m will be excavated along the alignment of sewer lines at 200 m intervals for classification of soil and to prepare bedding requirement of sewer lines.

**Output:** Obtain soil characteristics for structural design.

**Responsibility Distribution:** Team Leader will have responsibility for overall management and coordination of various survey and field investigation works. Structural Engineer will have primary responsibilities for formulating investigation requirements, strategy and methodology to be adopted, conduct actual investigation as necessary.

## MAIN TASK

### D 4.0 Cost Survey

A cost survey is proposed to gather basic rates of various material/equipment/labour at project city, their availability including servicing and O&M facilities, use of indigenous building material etc. for cost estimation.

**Output:** Market rates for determination of unit rates.

**Responsibility Distribution:** Project Engineer will have primary responsibility and he will be supported by the Team Leader.

## 3.1.2.2.5. DETAILED ENGINEERING DESIGN (for Phase I and Phase II)

### MAIN TASK

#### E 1.0 Engineering Design

- E 2.1 Establish standard design procedures for different components. Select computer packages for design.
- E 2.2 Carryout detail engineering design for various components of each sub project
- E 2.3 Prepare design calculations and design briefs justifying engineering solution
- E 2.4 Prepare detailed cost estimates
- E 2.5 Prepare detailed drawings
- E 2.6 Determine land acquisition requirements
- E 2.7 Prepare and submit 1<sup>st</sup> lot detailed engineering design reports for Phase I work.
- E 2.8 Prepare and submit 2<sup>nd</sup> lot detailed engineering design reports for Phase II work.
- E 2.9 Prepare operation and maintenance procedures for existing and new interventions of sewerage system
- E 2.10 Assist ULB's in preparing standard maintenance procedures for urban infrastructure system with respect to sewerage system.

All detailed designs will be carried out using latest technologies and softwares in strict adherence to criteria established in national and international standards.

**Output:** Detailed Engineering design and drawings, and operation and maintenance procedures prepared.



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**Responsibility Distribution:** *Team Leader, Project Engineer and Operation & Maintenance Specialist will have primary responsibilities for different sectored/component detailed engineering and designs.*

### **3.1.2.2.6. PROCUREMENT SERVICES (for Phase I and Phase II)**

#### **MAIN TASK**

##### **F 1.0 Prepare bid documents**

- F 1.1 Prepare necessary contract documentation following JBIC procedures as applicable.
- F 1.2 Prepare and submit bid documents along with tender drawings.

**Output:** Contract packages prepared.

**Responsibility Distribution:** *Team Leader will have the primary responsibility and will supported by Project Engineer.*

#### **MAIN TASK**

##### **F 2.0 Evaluate Bid Documents**

- F 2.1 Evaluate submitted bid documents as per the norms of JBIC and guidelines agreed with PIA/PMC
- F 2.2 Prepare comparative statement from the submitted bids.
- F 2.3 Assist PIA in selection process of the bidder.

**Output:** Finalization of contracts carried out.

**Responsibility Distribution:** *Bid evaluation will be the primary responsibility of the Team Leader. He will be assisted by the Project Engineer.*

#### **MAIN TASK**

##### **F 3.0 Assist PIA in Bidding Process**

Assist PIA in tender invitation process, evaluation and selection of bidder by providing technical and contractual backup support.

**Output:** *Tender process is established.*

**Responsibility Distribution:** *This task will primarily be carried out by Team Leader.*

#### **MAIN TASK**

##### **F 4.0 Award of work to the successful Contractor**

The Contractor's design and drawing will be checked and updating requirements suggested. Necessary changes will be discussed and Consultants will ensure modifications are incorporated and submission of revised designs and drawings done.

For project monitoring, the Consultants will review the work programme submitted by the contractor and will put the same in Project Management/Monitoring software.



Necessary MIS formats will be devised in consultation with the PMC. The Consultants will review the parallel activities and relevancy on the linking of different activities in this regard. The inventory schedule will also be made in consultation with the Contractor's mobilisation schedule. The Consultants will work out a cash flow schedule to correspond to the finalised work program. The Consultants will also ensure the fulfilment of financial obligations of the Contractor(s) - submission of bank guarantees, performance guarantee, insurance (works, workmen and third party) etc.

Review contractor's submission of construction programmes in terms of their suitability of adoption in particular condition and discuss necessary modifications and ensure adherence.

Review contractor's suggested manpower and machine/ equipment deployment. Identify changes as necessary for smooth completion of the works and advise contractors accordingly.

***Output:** Construction scheduling prepared. Adequacy of construction resources reviewed. Contracts finalized.*

***Responsibility Distribution:** Project Engineer will have primary responsibilities. Team Leader will have secondary responsibility.*

### **3.1.2.2.7. CONTRACT ADMINISTRATION, CONSTRUCTION SUPERVISION & QUALITY CONTROL (for Phase I and Phase II)**

#### **MAIN TASK**

#### **G 1.0 Assistance in fulfillment of Owner's obligation**

Execution works will be as per contract systems, Govt of Haryana. Construction/implementation drawings will form part of the contract document for taking up the construction work for item rate contracts. For pipeline and civil works all drawings will be sufficiently detailed. For any eventuality arising out of site condition, the Consultants will prepare supplementary drawings and details as may be required. In case of turnkey jobs, the contractor's design and drawings will be scrutinized, commented upon and modifications advised. The Consultants will recommend/accord formal approval of design and drawings complying with the requirements.

On commencement of the project, the Consultants will establish various quality assurance programmes and manual, frame the requirement of tests to be carried out, reporting formats for checks and approvals of the works done/supplies made, carry out tests to select/approve materials for construction. Consultants will also formulate different record keeping systems both for project monitoring. In regard to civil/concrete works, formats for pour cards, bar bending schedules, mix design, crushing strength test, tensile and elongation tests for reinforcement etc. will be



established. Other service agencies, if any, will be involved during the construction period for site clearance/repair of service lines etc. Consultants' team will work out necessary interaction programme with these agencies and will highlight the assistance required from such agencies for uninterrupted execution of the works.

Consultants will extend assistance to ensure timely fulfillment of obligations by owner for smooth implementation of the works. Such obligations will pertain to

- Permits, authorization, introductory documents to Clients
- Handing over the clear work sites to Clients and taking over to completed works
- Coordination with other agencies for removal/realignment of buried utilities and for safe disposal of surplus material
- Expeditious disposal of various contractual and technical issues

**Output:** *Construction drawings issued and quality control procedure established.*

**Responsibility Distribution:** *Project Engineer will primarily carry out this task with support from Team Leader and other core team members.*

## **MAIN TASK**

### **G 2.0 Supervise construction of project components**

- G 2.1 Deploy adequate supervisory personnel in terms of agreed manpower, required time frame and locations. Supervise all work components.
- G 2.2 Develop procedures for quality control in conformity with international practice and enforce proper quality control.
- G 2.3 Supervise sampling and testing of materials and equipments at site, and at elaborations
- G 2.4 Certify that quality of works conform to the specifications and drawings.
- G 2.5 Attend third party inspections, as necessary.
- G 2.6 Check installation and commissioning identify defects and ensure for corrective measures.
- G 2.7 Inspect works when substantially completed. Prepare defect lists and advise the contractors for rectification.
- G 2.8 Assist in preparation of maintenance procedures based on experience, normal practice, and manufacturer recommendations.
- G 2.9 Assist in preparation of as-built drawings and ensure submission as required.

**Output:** *Procedures for construction supervision established.*

**Responsibility Distribution:** *Project Engineers will be primarily responsible for accomplishment of the Task to be assisted by the Team Leader and other core team members.*

## **MAIN TASK**

### **G 3.0 Ensure Adequate Safety and Environmental Requirements**



G 3.1 Consultants will supervise and monitor implementation and maintenance of adequate safety measures, which include:

- Insurances
- Barricading, warning signs
- Shoring/shuttering
- Dewatering equipment
- Use safety gears
- Fire protection and fighting units
- First aid and medical facilities

Environmental and Social requirements will pertain to

- Air, water and noise pollution
- Storage of material and equipment, labour camp etc.
- Storage and safe disposal of spoils and surplus material

#### MAIN TASK

##### G 4.0 Assist Completion of Works & Final Claims

Consultants will certify settlement of final bills/claims taking due care of all obligations being met by the Contractor(s)/Supplier(s) during contract execution and defect liability period.

*Output: Completion of works and final claims certified.*

*Responsibility Distribution: Project Engineers will be primarily responsible for accomplishment of the Task to be assisted by the Team Leader.*

#### 3.1.2.2.8. PROJECT COMPLETION PROCESSING (for Phase I and Phase II)

#### MAIN TASK

##### H 1.0 Finalize 'As Built' Drawings

As per standard practices 'As built' drawings will be prepared by the Contractor. The Consultants will provide necessary guidance for finalizing the 'As built' drawings by the Contractors. The same will be checked and approved by the Consultants before being passed on to Employer.

*Output: As-built drawings prepared.*

*Responsibility Distribution: Team Leader will have primary responsibility.*

#### MAIN TASK

##### H 2.0 Preparation of Operation and Maintenance Manual



The Consultants will prepare the operation and maintenance manual taking necessary inputs from the Contractor(s)/Supplier(s) highlighting the operation and maintenance requirement and the tools and spares to be maintained.

The manual will essentially include startup procedures for treatment plant and pumping stations, general operations, wastewater / effluent sampling, analyses and reporting, system shutdown procedures, non-routine / routine maintenance and troubleshooting, emergency procedures and notification, etc. Besides, the manual will include procedures for record keeping, schedule of daily operation, inventory of stores, safety, etc.

***Output:** Operation and Maintenance Manual prepared.*

***Responsibility Distribution:** Operation & Maintenance Specialist will have primary responsibility with support from Team Leader.*

## **MAIN TASK**

### **H 3.0 Preparation of Supervision Manual**

The Consultants will prepare the Supervision Manual incorporating necessary and mandatory aspects of construction management e.g. progress monitoring, quality control, measurement, material approval, construction drawings, construction procedures, inspection, testing and rejections, claims of contractor – time and additional payment, variation orders, etc.

***Output:** Supervision Manual prepared.*

***Responsibility Distribution:** Project Engineer will have primary responsibility with support from Team Leader.*

## **MAIN TASK**

### **H 4.0 Preparation of Completion Report**

Consultants will prepare the completion report as per standard procedures and following the JBIC guidelines and formats. The Report will contain all aspects/elements of the project describing developments and constructed details, besides benefit analysis.

***Output :** Project completion deliverables prepared.*

***Responsibility Distribution:** Team Leader and Project Engineer will have primary responsibility with support from IT Specialist.*

## **3.1.2.2.9. CONDUCT TRAINING (for Phase I and Phase II)**

### **MAIN TASK**

#### **I 1.0 Prepare Training Module and Training Material**

To enhance capacity of Line Agencies to plan, design, execute and manage similar projects, the identified target staff groups will work together with the Consultants so that available skill levels and deficiencies can be assessed. Based on this assessment,



the Consultants will develop a structured training program and training courses. Training module and training material will be developed to suit learning styles and needs of the target group to be trained. ULBs will identify trainees and provide names and detailed shall lead to consultants.

**Output:** *Training module and training material prepared.*

**Responsibility Distribution:** *This task will primarily be carried out by Training Expert with the assistance from Team Leader.*

## **MAIN TASK**

### **I 2.0 Conduct Training**

Regular on-the-job training, classroom courses will be arranged at the Consultants office on the aspects of scheme design, implementation and O&M. Besides, workshops and seminars will be arranged – two during the design phase and remaining in the construction phase – for imparting new procedures introduced with special emphasis in computer applications, and transfer of knowledge for execution of works of similar nature.

In addition training programmes may be organised at places outside Haryana, within the country at institutions and agencies involved in similar works.

**Output:** *Capacity of Line Agencies enhanced.*

**Responsibility Distribution:** *This task will primarily be carried out by Training Expert with the assistance from Team Leader.*

### **3.1.2.2.10. REPORTING (for Phase I and Phase II)**

## **MAIN TASK**

### **J 1.0 Reports**

Consultants throughout their involvement in the assignment are required to generate number of reports, which will be meaningful tools for decision making process as well as for appropriate appraisal of all concerned with the progress of the project.

Envisaged reporting process is to comprise the following:

- Inception Report
- Survey Report
- Monthly Progress Report
- Draft Detailed Project Report
- Detailed Project Report
- Pre-qualification Document
- Draft Tender Document
- Final Tender Document
- Bid Evaluation Report
- Operation and Maintenance Manual



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- Supervision Manual
  - Project Completion Report

**Outputs:** *Project deliverables prepared.*

**Responsibility Distribution:** *Team Leader will have the primary overall responsibilities. Secondary responsibility will be borne by the Project Engineer in preparation of various reports as may be required.*

### 3.1.3. ENVIRONMENTAL ISSUES

JBIC is concerned about the environmental impacts of all their projects. In particular, the effects of environmentally sensitive projects, such as the YAP-II phase II project, are considered paramount in achieving a successful project. The objective of this project is to improve the environment in the Yamuna River Basin. In achieving this aim, care will be taken not to accept negative environmental impacts in some areas in order to gain improvements in others. Of particular sensitivity are the methods of dealing with resettlement and the disposal of treated wastewater effluent and sludge.