

Draft Development Plan of Gujarat Petroleum, Chemical & Petrochemical Special Investment Regional Development Authority (GPCPSIRDA)

Volume I

Section1- Existing Situation and Analysis

2011

Udyog Bhavan, Block No 4, 2nd Floor, Sector-11, Gandhinagar-382017

ACKNOWLEDGEMENT

Mott MacDonald acknowledges the valuable guidance, assistance and help extended to our team members from time to time and is indeed grateful to the following* individuals, departments and organisations

- Shri A K Jyoti, Chief Secretary, GoG
- Shri Maheshwar Sahu, PS (Industries and Mines), GoG
- Shri Agarwal, VC&MD, GIDC
- Shri Nayan Raval, Advisor (Proj), GIDC
- Shri M M Bhowmick, Advisor (TP), GIDC
- Mr Patel, CE, GIDC
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- Mr. Khundawala, GAIL, Dahej
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- Mr. C.M. Patel, Sub-Divisional Office, R & B Bharuch
- Mr. Manohar Bhai, Head Clerk, District Inspector of Land Records Revenue Department, Bharuch
- Mr. Prajapati, Resident Deputy Collector, Bharuch
- Ms. Vakde, Addl.Chitnis, Collector, Bharuch
- Mr. Dholiya, Mamladar, Bharuch
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- Mr. R.N. Kalita, Coordinating Dir / CEO, Bharuch-Dahej Railway Co. Ltd.
- Mr. A.K. Chattopadhyay, General Manager (Projects), ONGC Petro additions Limited (OPaL)
- Mr. K.M. Panchal, Chief Town Planner, Town Planning and Valuation Department
- Mr. Jha, Forests Department
- Mr. D.Sahoo, Superintending Surveyor, Survey Of India, Gujarat, Daman & Diu Geo Spatial Data Centre
- Prof. Dr. A.K.A.Rathi, Faculty of Planning and Public Policy
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- Mr. G.S. Jansali, Executive Engineer, Vadodara Irrigation Division
- Mr. Anurag Gupta, DGM(Geology), HOD (PSC), Director General of Hydrocarbons (DGH)
- Mr. Rao, RITES, Gurgaon
- Taluka office, Bharuch and Vagra
- Residents, various Industries in GIDC estates, Talathi & officers of villages in GPCPSIR

* The above list is not an exhaustive list

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Abbreviation

S.No.	Abbreviations	
1	AAI	Airport Authority of India
2	AEP	Annual Exceedance Probability
3	ATF	Aviation Turbine Fuel
4	BG	Broad Gauge
5	BISAG	Bhaskaracharya Institute for Space Application and Geo-Informatics
6	BMW	Bio-Medical Waste
7	BOD	Biological Oxygen Demand
8	BRTS	Bus Rapid Transit System
9	BSNL	Bharat Sanchar Nigam Limited
10	C/W	Carriage Way
11	C4/C7/C8	Carbon Compounds
12	CETP	Common Effluent Treatment Plant
13	COD	Chemical Oxygen Demand
14	CPCB	Central Pollution Control Board
15	CPHEEO	Central Public Health and Environmental Engineering Organisation
16	CRZ	Coastal Regulation Zone
17	CWC	Central Warehousing Corporation
18	CZBT	Central Zone Bara Track
19	dBa	Decibel
20	DDP	Draft Development Plan
21	DFC	Dedicated Freight Corridor
22	DGH	Director General of Hydrocarbons
23	DGMS	Director General Mines and Safety
24	DGVCL	Dakshin Gujarat Vij Company Limited
25	DILR	District Inspector of Land Records
26	DMIC	Delhi-Mumbai Industrial Corridor
27	DO	Dissolved Oxygen
28	DP	Development Plan
29	DPR	Detailed Project Report
30	DUPL	Dahej-Uran Pipeline
31	DVPL	Dahej-Vijapur Pipeline
32	EDC	External Development Charges
33	EH	Express Highway
34	EIA	Environment Impact Assessment
35	ELU	Existing Land Use
36	ETP	Effluent Treatment Plant
37	EWS	Economically Weaker Section
38	FICCI	Federation of Indian Chambers of Commerce and Industry
39	FRA	Flood Risk Assessment
40	FRC	Fibre Reinforced Concrete
41	FSI	Floor Space Index
42	GACL	Gujarat Alkalies & Chemical Limited

S.No.	Abbreviations	
43	GAIL	Gas Authority of India Limited
44	GCPTCL	Gujarat Chemical Port Terminal Company Limited
45	GDCR	General Development Control Regulation
46	GEPIIL	Gujarat Enviro Protection & Infrastructure Limited
47	GIDB	Gujarat Industrial Development Board
48	GIDC	Gujarat Industrial Development Corporation
49	GMB	Gujarat Maritime Board
50	GoG	Government of Gujarat
51	GOI	Government of India
52	GPCB	Gujarat Pollution Control Board
53	GPCPSIR	Gujarat Petroleum, Chemicals and Petrochemical Special Investment Region
54	GPS	Global Positioning System
55	GPSL	GPCPSIR Services Limited
56	GRAMZ	GEPIIL Waste Recycling & Management Zone
57	GSI	Geological Survey of India
58	GSPC	Gujarat State Petroleum Corporation
59	GSPL	Gujarat State Petronet Limited
60	GTPS	Gujarat Town Planning Scheme
61	GWSSB	Gujarat Water Supply & Sewerage Board
62	HTL	High Tide Line
63	ICD	Inland Container Depot
64	IMD	Indian Meteorological Department
65	Ind.	Industries
66	IPCL	Indian Petrochemical Corporation Limited
67	IRC	Indian Road Congress
68	IRS	Indian Remote Sensing Satellite
69	JDI	Japan Development Institute
70	JNPT	Jawaharlal Nehru Port Trust
71	JNPT	Jawaharlal Nehru Port Trust
72	kTA	Kilo Ton per annum
73	kV	Kilo Volt
74	LNG	Liquefied Natural Gas
75	LPCD	Litres Per Capita Per Day
76	m	Meters
77	mcm	Million Cubic Meters
78	MDI	Methylene Diphenyl Diisocyanate
79	MDR	Major District Roads
80	Mg/l	Milligram/ litre
81	MGD	Million Gallon
82	ML	Mining Licence
83	MLD	Million Litre
84	MM	Mott MacDonald

S.No.	Abbreviations	
85	MMPA	Million Metric Tonnes Per Annum
86	MoEF	Ministry of Environment & Forest
87	MoM	Minutes of Meeting
88	MoU's	Memorandum of Understanding
89	MSL	Mean Sea Level
90	MSME	Micro, Small and Medium Enterprises
91	MSW	Municipal Solid Waste
92	MVA	Mega Volt Ampere
93	NBSSLP	National Bureau of Soil Survey & Landuse Planning
94	NEERI	National Environment Engineering and Research Institute
95	NELP	New Exploration Licence Policy
96	NEPL	New Exploration of Petroleum Lease
97	NG	Narrow Gauge
98	NGL	Natural Ground Level
99	NH	National Highway
100	NRVY	National Railway Vikas Yojana
101	ODP	Other District Roads
102	OFC	Optical Fibre Cable
103	OISD	Oil Industry Safety Directorate
104	ONGC	Oil and Natural Gas Commission
105	OPaL	ONGC Petro additions Limited
106	OWC	Organic Waste Converter
107	PCP	Petroleum, Chemical & Petrochemical
108	PCU	Passenger Car Unit
109	PEL	Petroleum Exploration Lease
110	PLU	Proposed Landuse
111	PNGRB	Petroleum and Natural Gas Regulatory Board
112	PPP	Public-Private Partnership
113	PSU	Public Sector Unit
114	R&B	Roads & Building
115	RCC	Reinforced Cement Concrete
116	RDA	Regional Development Authority
117	RIL	Reliance Industries Limited
118	RoU	Right of Use
119	ROW	Right of Way
120	Rs/ INR	Indian Rupee
121	SEZ	Special Economic Zone
122	SH	State Highway
123	SIR Act	Special Investment Region Act
124	SoR	Schedule of Rates
125	Sq.Km	Square Kilometre
126	sqm	Square Meters

S.No.	Abbreviations	
127	SSNN	Sardar Sarovar Narmada Nigam Limited
128	STP	Sewerage Treatment Plant
129	SWD	Storm Water Drainage
130	SWM Manual	Solid Waste Management Manual
131	TDI	Toluene Diisocyanate
132	TDO	Taluka Development Office
133	TP	Town Planning
134	TP & UD Act	Town Planning & Urban Development Act
135	TTP	Tertiary Treatment Plant
136	UDPFI	Urban Development Plans Formulation & Implementation Guidelines
137	V/C Ratio	Volume/Capacity Ratio
138	VGGIS	Vibrant Gujarat Global Investors Summit
139	VR	Village Roads
140	WR	Western Railway

1. Introduction

“A Petroleum, Chemical and Petrochemical Investment Region (PCPIR) would be a specifically delineated investment region with an area of around 250 square kilometres planned for the establishment of manufacturing facilities for domestic and export led production in petroleum, chemicals & petrochemicals along with the associated services and infrastructure”, PCPIR Policy, Government of India

1.1 Project Genesis

The Government of India launched a Policy Resolution for Promotion of **Petroleum, Chemicals and Petrochemical Investment Regions (PCPIRs)** in May 2007.

This concept attempts to draw parallels from the world class models of chemical & petrochemical hubs in the Middle East, South East Asian and European Countries that have given a significant boost to the sector as well as lead to regional growth and development.

The policy objectives are focused on the promotion of investment in the petroleum and petrochemicals sector through the provision of an efficient regulatory system and world class infrastructure. The policy has provided an overall concept guideline and has laid few specifications on the minimum standards required for setting up PCPIRs. Additionally the policy outlines the role of the Central Government and State Government in terms of budgetary provisions and institutional framework apart from other fundamental guidelines.

The Gujarat Government through its nodal agency Gujarat Industrial Development Corporation (hereinafter referred to as Client) decided to take the first mover advantage and appointed Mott MacDonald Private Limited (hereinafter referred to as Consultants) to prepare the “Application” on behalf of the Government of Gujarat. Eventually on the basis of the “Application” submitted by the Government of Gujarat, an area of 453 sq.km in Bharuch District of Gujarat, was approved and declared as one of the first 3 PCPIRs of the Country, the others being Andhra Pradesh PCPIR and West Bengal PCPIR.

A joint venture between Oil and Natural Gas Commission (ONGC) and Gujarat State Petroleum Corporation (GSPC), ONGC Petro Additions Ltd (OPaL), has been promoting the GPCPSIR as the ‘lead anchor’.

1.2 Objective of the Assignment

To prepare a Draft Development Plan for GPCPSIR as per the Gujarat Special Investment Region Act, 2009

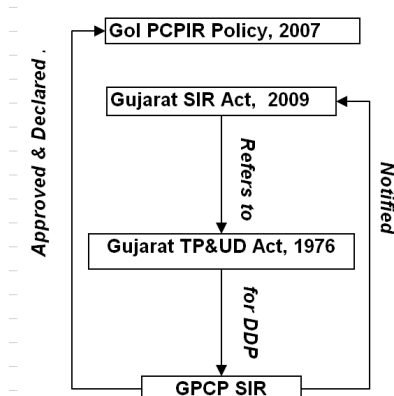
Figure 1.1: Launch of PCPIR Policy by the Honourable Minister



Source: FICCI

1.3 Need for the Assignment

Government of Gujarat has prepared a legal framework to enable development of mega investment regions and industrial areas within the state by promulgating an Ordinance namely Gujarat Special Investment Region Act, 2009 (hereinafter referred to as Gujarat SIR Act 2009)*. As a consequence to the Act, The GPCPSIR was declared and notified as “The Gujarat Petroleum, Chemicals and Petrochemicals Special Investment Region” in the Government of Gujarat Gazette notification dated 9th June, 2009 (hereinafter referred to as GPCPSIR). **Section 17, Sub-Section (1) of the Gujarat SIR Act 2009** identifies that the provisions of The Gujarat Town Planning and Urban Development Act, 1976 (hereinafter referred to as Gujarat TP & UD Act, 1976) would be applied with respect to the **Development Plans** and to the Town Planning Schemes made under this Act. **The Gujarat TP&UD Act, 1976** has laid down the following pre-requisites;



■ **Clause 9(1), Gujarat TP&UD Act, 1976 – Relevance of Draft**

Development Plan: This clause identifies that after the constitution of the Area Development Authority, it should prepare a Draft Development Plan for its designated area within three years from the declaration of such area as a development area.

- **Clause 11, Gujarat TP&UD Act, 1976:** This Draft Development Plan shall be on a scale of 1:8000 and should show in distinguishing prescribed colours the area or sites and the uses to which they are proposed to be put.

It is for this purpose that Gujarat Industrial Development Corporation (GIDC, the Client) has commissioned Mott MacDonald (MM, the Consultants) to prepare the Draft Development Plan (hereinafter referred to as DDP) for GPCPSIR

as per the statutory provisions.

1.4 Scope of Assignment

As per the Section 12 of the Gujarat TP&UD Act, 1976 the draft development plan needs to indicate the manner in which the use of land in the area covered by it shall be regulated and also indicate the manner in which the development therein shall be carried out. In particular, it shall provide, so far as may be necessary, for all or any of the following matters, namely:

* To provide for establishment, operation, regulation and management of large size Investment Regions and Industrial Areas in the State of Gujarat; and to specially enable their development as global hubs of economic activity supported by world class infrastructure, premium civic amenities, centres of excellence and proactive policy framework; and for setting up an organizational structure with that purpose and for matters connected therewith or incidental thereto

- Proposals for designating the use of the land for residential, industrial, commercial, agricultural and recreational purposes;
- Proposals for the reservation of land for public purposes, such as schools, colleges and other educational institutions, medical and public health institutions, markets, social welfare and cultural institutions, theatres and places for public entertainment, public assembly, museums, art galleries, religious, buildings, play grounds, stadium, open spaces diaries and for such other purposes as may, from time to time, be specified by the State Government.
- Proposals for designation of areas for zoological gardens, green belts, natural reserves and sanctuaries.
- Transport and communications, such as roads, highways, parkways, railways, waterways, canals and airport, including their extension and development.
- Proposals for water supply, drainage, sewage, disposal, other public utility amenities and services including supply of electricity and gas.
- Reservation of land for community facilities and services.
- Proposals for designation of sites for service industries, industrial estates and any other industrial development on an extensive scale.
- Preservation, conservation and development of areas of natural scenery and landscape.
- Preservation of features structures or places of historical, natural, architectural or scientific interest and of educational value.
- Proposals for flood control and prevention of river pollution.
- Proposals for the reservation of land for the purposes of Union, any State, local authority or any other authority or body established by or under any law for the time being in force.
- The filling up or reclamation of low lying, swampy or unhealthy areas or levelling up of land.
- Provision for controlling and regulating the use and development of land within the development area, including imposition of conditions and restrictions in regard to the open space to be maintained for buildings, the percentage of building area for a plot, the location, number size, height, number of storeys and character of buildings and density of built up area allowed in a specific areas of land may or may to which a building or specified area of land may or may not be appropriated, the sub-divisions of plots, the discontinuous of objectionable uses of land in any area in any specified periods, parking paces, loading and unloading space for any building and the size of projections and advertisement signs and hoardings and other matters as ay be considered necessary for carrying out the objects of this act.
- Provision for preventing or removing pollution of water or air caused by the discharge of waste or other means as a result of the use of land.

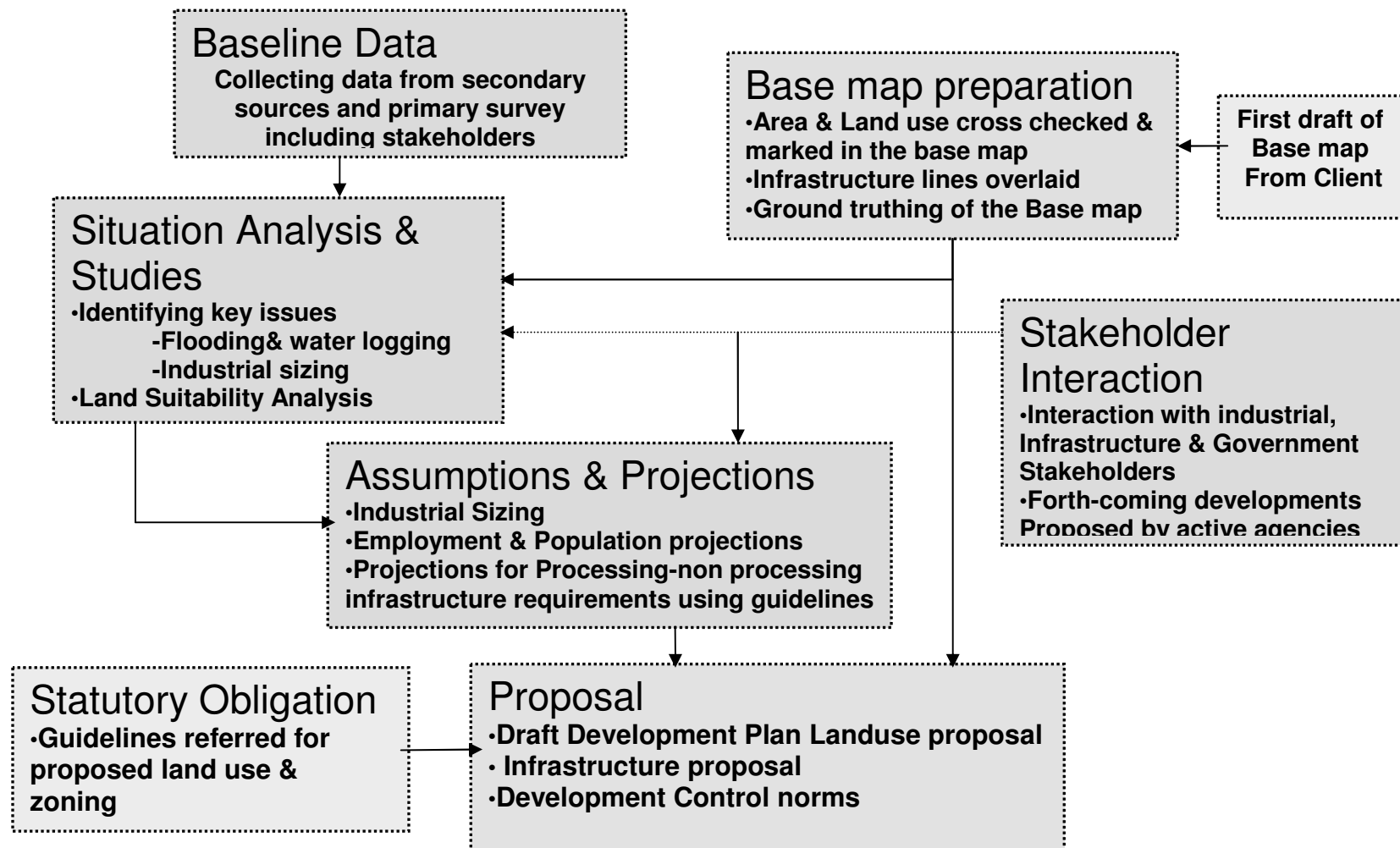
- Such other proposals for public or other purposes as may from time to time be approved by the area development authority or as may be directed by the State Government in this behalf.

1.5 Approach and Methodology

The approach adopted for the GPCPSIR DDP is primarily consultative, understanding and incorporating to the extent possible the requirements of various stakeholders and the activities already initiated in GPCPSIR area. Also, the DDP proposal is based on various technical studies done for issues like flooding on the site and the requirements of the industries already operational in the GPCPSIR area. Apart from these, the approach includes best practices and inspirations from state of the art international PCP industrial areas.

The following Figure 1.2 briefly depicts the methodology adopted for the DDP preparation for GPCPSIR. The methodology embraces the key components of DDP preparation process. The process is primarily based on analytical assessment of the existing situation and consultative discussions among various stakeholders. The GPCPSIR methodology can be divided into five broad stages including: Baseline information, Base Map preparation, existing situation analysis, projections and final land use and infrastructure proposals.

Figure 1.2: GPCPSIR DDP Methodology



1.6 Report Structure

The DDP report structure is based on the requirements stated in the Gujarat TP&UD Act, 1976.

Table 1.1: Report Structure

Chapter Name	Title	Description
Volume I – Section 1		
Existing Situation and Analysis		
Chapter 1	Introduction	This is an introductory chapter. It gives a broad idea about the genesis of the project, need of the project, approach & methodology, report structure and limitations of the project. Applicable legal framework is also discussed in this chapter briefly.
Chapter 2	Regional Context	As the name suggests, in this chapter regional context of GPCPSIR is described. Regional setting of any place gives an overview of the symbiotic relationship or the interdependence that it exhibits within its setting and its area of influence. It is based upon various factors such as administrative, road rail linkages, resource dependencies, movement, etc. with respect to physical, economic and social aspects. Hence this chapter provides a comprehensive idea about the regional influence zone and growth centres.
Existing Situation		
Chapter 3	Baseline Information	Base line information that documents the current status in relation to an issue and/or the historic situation is a key component of DDP which provides an information base to monitor and assess during planning and effectiveness for implementation. These have been obtained from various government authorities, stakeholders, reconnaissance survey etc. Other basic information regarding the site is obtained from secondary sources.
Chapter 4	Base Map	This chapter gives a brief idea about the base map and its related information. The map obtained from the Client has been geo referenced upon which thematic data has been overlaid and analyzed. Finally verification of existing land use with the help of a sample ground truthing exercise has updated the area statement details.
Analysis		
Chapter 5	Situation Analysis	Chapter 5 examines the study area's existing situation of land use, social infrastructure, economic characteristics, physical infrastructure and environmental considerations. It includes an important exercise of identification of critical issues based on stakeholder consultation. Stakeholders include Government agencies, industrial and infrastructure agencies. This chapter highlights water logging and flooding issues and situation analysis of flood

Chapter Name	Title	Description
		<p>risk for the concerned area.</p> <p>A land suitability analysis based on identified parameters concludes the first volume of the DDP report.</p>
Volume I – Section 2	Studies & Surveys	
Study 1	Flood Risk Assessment	<p>Water logging in the GPCPSIR is a key concern and it is acknowledged that for the study area therefore a Flood Risk Assessment (FRA) study has been carried out for the project. This section includes the details of the study. The study also analyses the site drainage related issues and suggests possible methods for flood risk mitigation for the site.</p>
Study 2	Industrial Sizing	<p>The Industrial sizing for GPCPSIR area has been done on the basis of three aspects including: Lessons learnt from Industrial Survey of GIDC Industries at Dahej, Lessons learnt from international and Indian PCP Estates, Study of chemical sub-sectors by MM in-house research team. The industrial sizing is proposed for GPCPSIR on the basis of above mentioned studies and detailed in this section.</p>
Volume II	Development Plan Proposals	
Projections		
Chapter 1	Vision & Future projection	<p>This Chapter identifies the overall vision for the Draft Development Plan and the desired objectives. Specific objectives correspond to the key parameters as identified within the Situation Analysis and Stakeholder Consultation. This chapter explains various projections to justify and formulate DDP plan. These are as follows:</p> <ul style="list-style-type: none"> • Industrial Projections • Employment Projections • Population Projections • Infrastructure Projections
Chapter 2	Development Guidelines and Planning Norms	<p>This chapter includes the relevant Development Guidelines and Planning Norms used while designing and detailing the Processing as well as Non-processing areas.</p>
Proposal		
Chapter 3	Proposed Draft Development Plan	<p>This chapter details the development plan prepared for the plan period describing proposed land use distribution, proposed Infrastructure facilities, phasing of Development Plan.</p> <p>The chapter also includes infrastructure planning for the concerned area (processing and non-processing area) upto a level of sub-zones which are expected to be in the range of 100-500 hectare. The concept includes utility corridor or along the road networks or a combination of both. The infrastructure planning component would include the following:</p> <ul style="list-style-type: none"> • Road Network

Chapter Name	Title	Description
		<ul style="list-style-type: none"> • Water Supply • Sewerage system • Drainage system • Effluent management • Power supply • Gas Infrastructure • Telecommunication
Chapter 4	Plan Implementation	<p>This chapter describes the development plan, project costing and project implementation process within institutional framework. Detailed roles and responsibilities of each stakeholder, resource mobilisation and Implementation Schedule have also been discussed here.</p> <p>Phase-wise implementation schedule has been prepared for planned project activities and block estimates have been prepared for the proposed infrastructure planning component. Block estimates of various items of works have been carried out as per the latest Schedule of Rates (SoR) of the various Departments of State Government. Where the schedule of rate was not available, the Consultants have used the appropriate market price in consultation with the Client.</p>
Volume III	GDCR	
Chapter 1	GPCPSIR Development Control Regulations (GDCR) (Section wise)	To regulate development within the framework of a development plan, development control regulations are prescribed as part of the development plan report. The development control regulations are framed specific for this area on the basis of the existing development control regulations prescribed in GTP&UD Act 1976.
Folio	GPCPSIR Maps	
	Maps	<p>GPCPSIR Maps: Existing land use, Existing infrastructure, Proposed Land use, Proposed Infrastructure, Proposed Village sheets</p> <p>GPCPSIR Draft Development Plan: 1:8000 scale sheets of GPCPSIR (~60 sheets)</p>

1.7 Assignment Limitations

The constraints and limitations experienced during the preparation of the Draft Development Plan for Gujarat PCPSIR are elaborated below

- The satellite data and IRS data of years 2005-06 and 2007 have been used for the base map. This brings in the possibility of missing out on the development that has taken place in the area after year 2007. We have tried to overcome this limitation to a great extent as the latest land records data of 2009 have been incorporated in the Base Map.
- The cadastral maps of forty four villages have been joined together to achieve the cadastral map for the entire GPCPSIR area. Therefore, constraints and limitations of the software used and element of human error have prevailed during the Base Map preparation exercise

- The accuracy of the village area and land use data will depend on the data available at the DILR office and the Mamlatdar office of Bharuch and Vagra Taluka since these are the most authentic sources of Land records in Bharuch District.
- There has been limited sharing of information by select industries during the primary survey of Industries conducted for the DDP project. This has resulted in limited availability of information on certain parameters for the industrial sizing exercise

Data received on effluent disposal system from the industries survey also depends on the limited information revealed by the select industries. This brings in limitations in terms of statistical conclusion. We have tried to overcome this by using data from parallel case studies.

2. Regional Context

Regional setting gives an overview of the symbiotic relationship that the site, in context, exhibits with its area of influence. It is based on several factors such as administrative; inter connectivity; backward & forward linkages etc.

2.1 Introduction

As per the Indian Petroleum & Natural Gas report, 2007-08, published by Ministry of Petroleum & Natural Gas Government of India, Gujarat accounts for 53 per cent of India's crude oil production; 30 per cent of India's natural gas production; 48 per cent of India's installed refining capacity and 60 per cent of India's total crude oil import facility. Further Gujarat has taken a pioneering role in utilizing natural gas for power generation, fertilizer production, manufacturing and transportation. With an increasing presence of upstream, downstream and midstream companies in the sector, the state can be called the chemical and petrochemical hub of India. With the GPCPSIR, phenomenal growth is further envisaged.

2.2 GPCPSIR

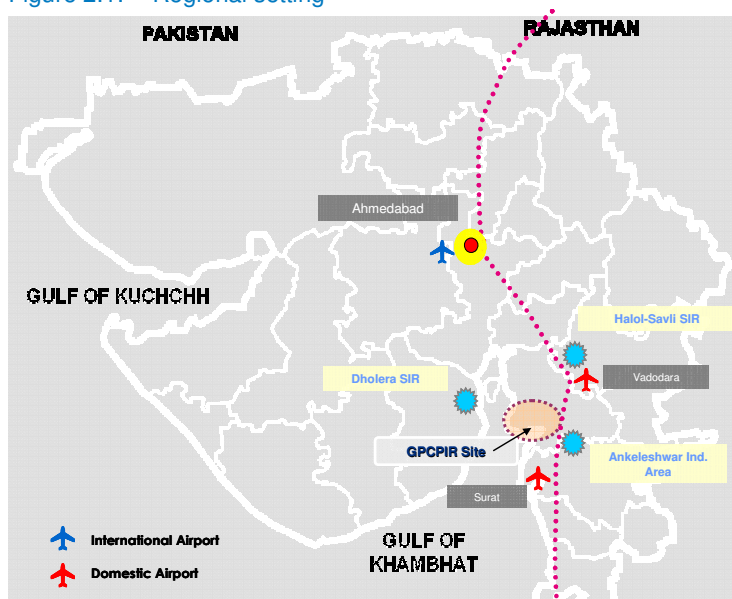
The Government of Gujarat has proposed to locate the GPCPSIR in Dahej. Dahej is an industrialised location and has the presence of chemical & petrochemical units. It is close to the other industrial pockets of Ankleshwar, Jhagadia and Panoli wherein chemical manufacturing units are also present.

The influence area for GPCPSIR is considered to be within a radius of 150 kms from the boundary of the site.

2.2.1 Regional Connectivity

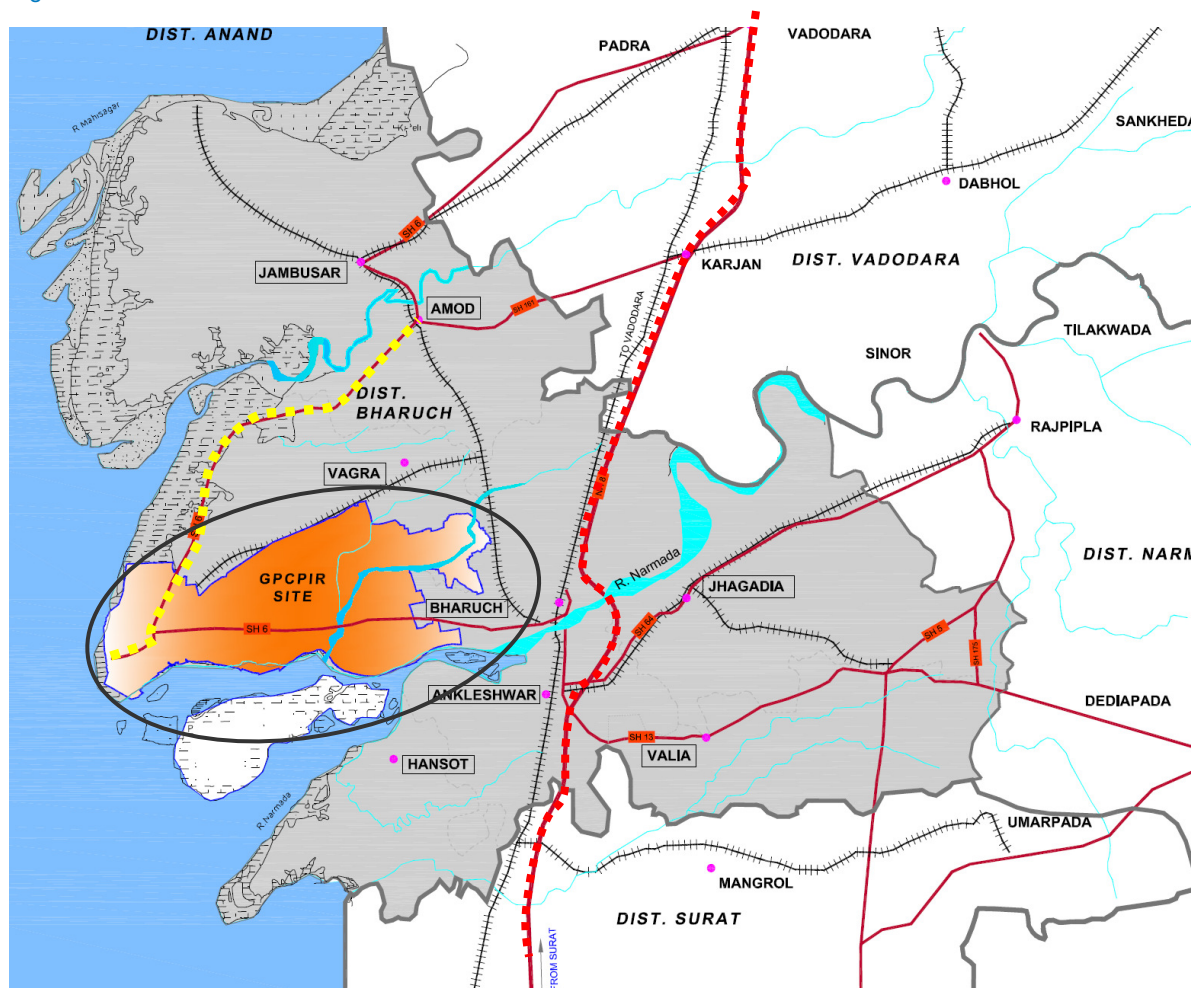
GPCPSIR has the advantages of domestic airports within 100 kms (Vadodara and Surat) and international airports within 200 kms distance (Ahmedabad and Mumbai). In the immediate vicinity an airstrip at Ankleshwar is in proposal. In terms of road and rail transportation the GPCPSIR has the advantage of being part of the Delhi Mumbai Industrial Corridor which draws its benefits from multiple modes of high speed connectivity including National Expressway No. 1, National Highway 8, Delhi Mumbai Western Railway and finally the proposed Dedicated Freight Corridor. The region's well established connectivity with domestic as well as international markets offers accessibility to numerous sourcing options for development of chemical and petrochemical based industries in the region. (Refer figure 2.1)

Figure 2.1: Regional setting



Source: MM

Figure 2.2: GPCPSIR Location in Bharuch District



Source: Site superimposed on Map of Gujarat

2.2.2 Regional Resources

The availability of natural gas at the first place had triggered industrialization in the region. The gas produced from ONGC wells in the Gandhar region provided feedstock to petrochemical complex which was initially developed by Indian Petrochemical Corporation Limited (IPCL) and was later-on taken over by Reliance Industries Limited (RIL).

The establishment of LNG re-gasification terminal by Petronet LNG Limited at Dahej in the year 2003 further strengthened availability of natural gas. The proposed GPCPSIR enjoys strategic location advantage with respect to raw material availability to sustain large number of chemicals and petrochemical industries. The wide-scale availability of salt in the region has resulted in the development of five Chlor-alkali manufacturing facilities and thereby opening huge avenues for integration of petrochemicals and chemicals segment.

2.2.3 Regional Industrial Climate

The District of Bharuch witnessed a surge in investments in chemicals & petrochemicals, drugs & pharmaceuticals, engineering and textiles etc in the past decade. The district is an inherent part of the popularly referred golden corridor for chemical and petrochemical industries which extends from Ahmedabad to Vapi. Proposals have been prepared for 16 industrial estates and 8 SEZs apart from the GPCPSIR project within the district. The presence of existing industrial estates at **Ankleshwar, Jhagadia and Panoli** has also enhanced the location attractiveness of the district.

A large number of business conglomerates have set manufacturing units in this district including, Sanofi Aventis, Glenmark, Lupin, BASF, Bayer Crop Science El DuPont etc. Information collected from District Industries Centre, Bharuch, reveals that there are as many as 12,857 MSMEs, having an employment of 45,971 and an investment of INR 1206 crore. At the same time medium and large scale industries are around 647 in number with total investment of INR 1,25,472 crore, employing 82,289 people.

2.2.4 Proposed Industrial Corridors/Growth Poles

■ Delhi Mumbai Industrial Corridor

The GPCPSIR falls within the proposed Delhi Mumbai Industrial Corridor which has been conceptualised to range within 150 km on both sides of the proposed Freight Corridor. The development of the Delhi-Mumbai Industrial Corridor (DMIC) is a key opportunity for attracting investments into Gujarat. The total length of the corridor is 1,483 km, of which Gujarat has a major share of 564 km (38 per cent). The corridor is proposed so as to have excellent connectivity to the non-major ports of Mundra, Pipavav, Dholera, Dahej, Hazira and Maroli. The following key industrial nodes (Mega Investment Regions and Industrial areas) have been identified within the Influence Area of GPCPSIR.

- **Vadodara-Ankleshwar Industrial Area:** Vadodara-Ankleshwar Industrial Area has been delineated at Halol-Savli and is currently a notified Special Investment Region. It is located around 15 Kms from Vadodara in an area of 123 sq kms. The proposed Industrial activity for the SIR includes clusters for: Engineering, electronics and electrical, automobile and engineering plastics industries.
- **Aliyabet Special Investment Region:** Aliyabet SIR has been proposed to be an entertainment and eco friendly area. It is located on the opposite bank of River Narmada adjacent to the site and is at a distance of about 35 kms from Ankleshwar. It is proposed to be spread over an area of around 163 sq kms. The SIR will include development in sectors such as eco tourism, entertainment city, aqua park etc

2.2.5 Regional Urban Centres

GPCPSIR area is located around 30 Kms from Bharuch Town, 43 Kms from Ankleshwar Town and 86 Kms from Vadodara City (Refer Figure 2.3). Bharuch and Ankleshwar are old towns existing since 800 AD.

2.2.5.1 Bharuch and Ankleshwar

Bharuch Municipality was established in 1851 and Ankleshwar Municipality in 1872. ONGC drilled the first well at Ankleshwar in 1960 which spurred industrialisation in this region. Bharuch and Ankleshwar urban agglomerations are classified as Class 1 Towns and have all the facilities of a Class I Town.

2.2.5.2 Vadodara

Vadodara, the third largest city in the state of Gujarat, is one of the focal points of industrial growth in Western India. The city became a metropolis in 1991.

The city witnessed a sudden spurt in industrial activity with the establishment of the Gujarat Refinery in 1962. Various large-scale industries such as Gujarat State Fertilizers and Chemicals (GSFC), Indian Petrochemicals Corporation Limited (IPCL) and Gujarat Alkalis and Chemicals Limited (GACL) have come up in the vicinity of the Gujarat Refinery. Vadodara City is now one of India's foremost industrial centres with dominant groups of chemicals and pharmaceuticals, cotton textiles and machine tools. Vadodara is also a Class I Town.

Figure 2.3: Major Towns around GPCPSIR



3. Baseline Information

Base line information that documents the current status with respect to various sectors of importance is a key component in the preparation of DDP. It provides an information base for monitoring and assessment during plan implementation. The baseline information has been obtained from various government authorities, industrial stakeholders, surveys etc.

3.1 Introduction

3.1.1 Location

The site for GPCPSIR is spread over the *taluka* of Vagra & Bharuch within Bharuch District of South Gujarat. The site is surrounded by the Gulf of Khambhat in the west, Narmada River & Aliabet Island in the south, villages of Vagra and Bharuch Taluka in the east and Dahej-Samni-Bharuch railway line in the North. Geographically the site falls within the latitudes of 21° 36' 37" and 21° 54' 8" N and longitudes of 72° 29' 48" and 72° 57' 30" E. Refer Appendix A for location details of site.

3.1.2 Notified Area

According to the Industries and Mines Department notification, Sachivalaya, Gandhinagar 9th June 2009, published in the Gujarat Government Gazette, GPCPSIR encompasses an area of 45298.59 Ha. It is spread over 44 villages, the area break up² as published in the Gazette has been presented in Table 3.1 and a copy attached with Appendix B.

Table 3.1: GPCPSIR-Notified Area Details

S.No.	Taluka	Village	Extent within GPCPSIR	Area in Ha	Area Source
1	Vagra	Aragama	Partly	351.49	DILR Map
2	Vagra	Vorasamni	Completely	550.59	DILR
3	Vagra	Vilayat	Completely	1674.56	DILR
4	Vagra	Bhersam	Completely	1435.06	DILR
5	Vagra	Sayakha	Completely	1567.71	DILR
6	Vagra	Kothia	Completely	606.26	DILR
7	Vagra	Vahiyal	Partly	1804.89	DILR Map
8	Vagra	Pipalia	Partly	448.09	DILR Map
9	Vagra	Pakhajan	Partly	1282.53	DILR Map
10	Vagra	Nadarkha	Partly	333.80	DILR Map
11	Vagra	Sambheti	Partly	323.91	DILR Map

² The area break up of GPCPSIR has been further finalised through an extensive area verification process detailed out in Chapter 4.

S.No.	Taluka	Village	Extent within GPCPSIR	Area in Ha	Area Source
12	Vagra	Janiadara	Partly	444.95	DILR Map
13	Vagra	Akhod	Completely	862.56	DILR
14	Vagra	Nandida	Completely	1222.80	DILR
15	Vagra	Sadathala	Completely	449.72	DILR
16	Vagra	Khojbal	Completely	1222.53	DILR
17	Vagra	Bhensali	Completely	563.47	DILR
18	Vagra	Atali	Completely	1082.73	DILR
19	Vagra	Galenda	Completely	579.18	DILR
20	Vagra	Samatpor	Completely	293.06	DILR
21	Vagra	Vav	Partly	480.38	DILR Map
22	Vagra	Jolva	Completely	874.81	DILR
23	Vagra	Vadadla	Completely	685.87	DILR
24	Vagra	Dahej	Partly	7107.00	DILR Map
25	Vagra	Lakhigam	Completely	1061.73	DILR
26	Vagra	Luvara	Completely	895.15	DILR
27	Vagra	Jageshwar	Completely	515.03	DILR
28	Vagra	Ambheta	Completely	1516.08	DILR
29	Vagra	Suva	Completely	1431.58	DILR
30	Vagra	Rahiad	Completely	1441.92	DILR
31	Vagra	Koliad	Completely	974.154	DILR
32	Vagra	Vengani	Completely	607.95	DILR
33	Vagra	Kaladara	Completely	1755.92	DILR
34	Bharuch	Amleshwar	Completely	2205.51	DILR
35	Bharuch	Bhuva	Completely	348.47	DILR
36	Bharuch	Eksal	Completely	793.05	DILR
37	Bharuch	Kesrol	Completely	789.07	DILR
38	Bharuch	Navetha	Completely	457.99	DILR
39	Bharuch	Manad	Completely	1061.89	DILR
40	Bharuch	Mahegam	Completely	560.85	DILR
41	Bharuch	Bhadbhut	Completely	909.57	DILR
42	Bharuch	Kasva- Samni	Completely	842.72	DILR
43	Bharuch	Vadva	Completely	380.92	DILR
44	Bharuch	Sankhwad	Completely	501.06	DILR
TOTAL				45298.59	

3.2 Land Use

The existing land use of the site has been presented in Table 3.2. The land use has been compiled using the standard forms such as Tariz I & II, Village Summary Sheet and Form 8A obtained from the sources of District Inspector of Land Records (DILR), Taluka Development Office (TDO) and Mamlatdar. The land use has been verified through extensive ground truthing exercise, inputs from the Client and information

received from the Sardar Sarovar rehabilitation agency. The methodology for verification of the land use has been presented in detail in Chapter 4.

Table 3.2: Land use

Landuse categories	Area (Ha)	% of Total Area
Agriculture	21669.09	47.84
Roads	615.87	1.36
Railway	20.12	0.04
Public-Semi Public	1817.32	4.01
Non Agricultural conversion		
-Residential	6.97	0.02
-Commercial	1.42	0.003
-GIDC Estates	10977.11	24.23
-Sardar Sarovar Rehabilitation Colony	1195.95	2.64
-Other NAs	146.85	0.32
Utilities	369.52	0.82
Wastelands	6562.71	14.49
Water bodies	1109.02	2.45
Forest	806.66	1.78
TOTAL AREA	45298.59	100

Source: Mamlatdar office, TDO, DILR & compilation by MM.

Also refer Appendix D for the existing landuse map and village wise land use status in Appendix Appendix C.

3.2.1 Land Title

GPCPSIR area includes land owned by the Government, Gujarat Industrial Development Corporation (GIDC) and land privately owned. The details of the same are elaborated below.

3.2.1.1 Government Land

The Government land encompasses a total area of 11301.2 ha and comprises of wastelands, public-semi public land use, utilities, roads, railways, forests and water bodies. The Government land accounts for about 25% of the total site area.

3.2.1.2 GIDC

A total of 10,977.11 ha of land fall under GIDC Dahej Estate 1, 2 and GIDC Vilayat Estate. The developed GIDC industrial estate accounts to about 25% of the total site area.

3.2.1.3 Private Land

The remaining land of about 23,020.28 ha falling under agricultural use and non agricultural conversions including rehabilitated colonies is privately owned. About 50% of the site area is privately owned.

3.2.2 Land Acquisition

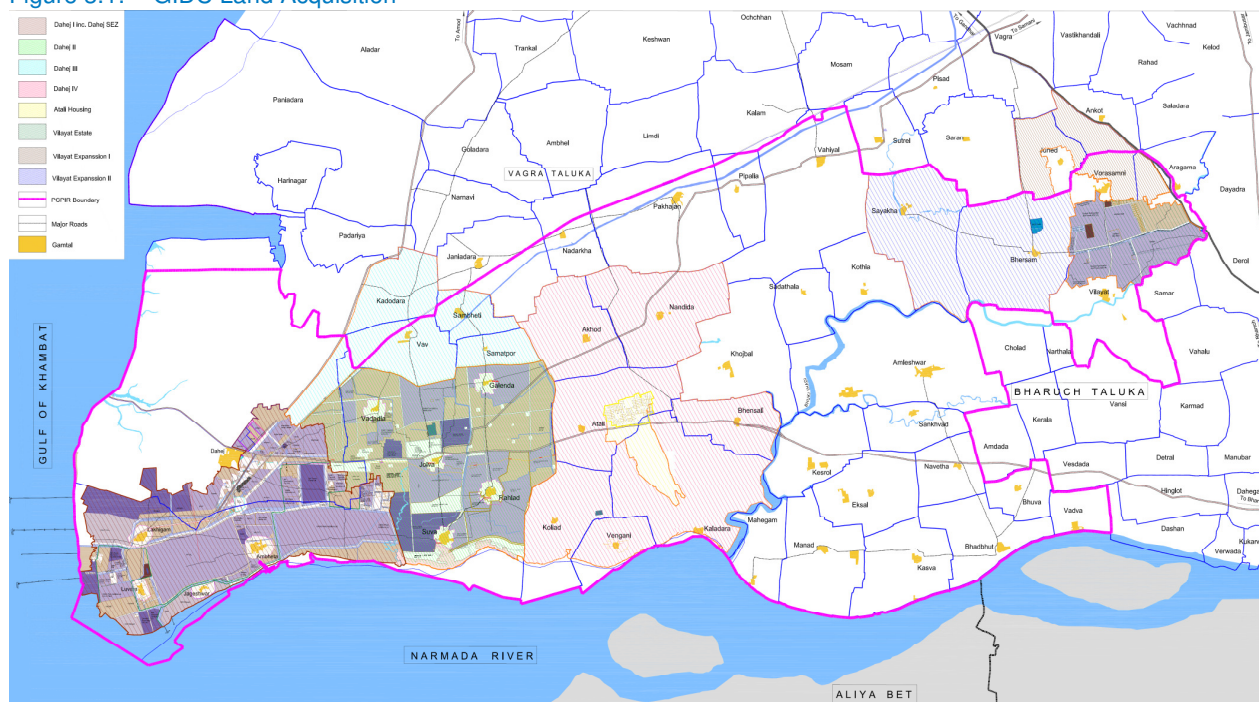
GIDC has developed various estates in GPCPSIR area by acquiring land and developing the same into industrial estates. Proposed expansions of the existing industrial estates have been marked by GIDC. The expansion area is under the process of land acquisition. Area and acquisition status is given in the table below.

Table 3.3: Land Acquisition by GIDC

Proposed Expansion	Villages included	Area (ha)	Land Acquisition status	Present Rate of Acquisition* (Rs/ hectare)
GIDC Industrial estate Dahej phase III	Vav, Sambheti, Samatpor, Kadodara (among these Kadodara is out of GPCPSIR)	1943	Only primary notification has been done (land use frozen)	17,50,000
GIDC Industrial estate Dahej phase IV	Koliad and Vengani	5869	Submitted proposals	17,50,000
GIDC Industrial estate Vilayat Expansion 1	Aragama, Juned, Vorasamni and Ankot - Among these, Juniad and Ankot are beyond GPCPSIR boundary	1161	Section 4 issued	50, 00,000
GIDC Industrial estate Vilayat Expansion 2	Sayakha and Bhersam	2334	No notification issued yet	Not Applicable
Atali housing	Part of Atali village	146	Acquired and developed	Already developed
Atali expansion	Part of Kaladara	293	Primary notification issued on 6th Nov., proposal in progress for private land of 289 ha	
Housing	Eksal, Keshrol, Manad	714	Pending	Not Applicable
Total proposed area		12,460		

Source: GIDC and Chitnis Department, Bharuch. (*subject to change as per the revision by GoG)

Figure 3.1: GIDC Land Acquisition



Source: GIDC

3.3 Demography and Socio-Economic Pattern

The existing demographic situation is detailed below. Further to this GIDC under the aegis of GPCPSIR Welfare Society has commissioned a study which has detailed the socio-economic conditions of the villages falling within the site.

3.3.1 Population & Density

The total population of this area is 53,757 which is spread over 44 villages. The density of population is significantly low with the maximum density being 4.83 persons per hectare in Vorasamni village while all other villages have population density less than 2 persons per hectare.

3.3.2 Population Growth rate

The decadal growth rate of population of the villages falling within GPCPSIR shows that the Dahej Village has witnessed the highest population growth (79%) in the last decade, mainly due to industrialisation. Jolva and Vadadla villages have witnessed an approximate growth rate of 50%. Apart from that, there is no other significant growth trend. Infact six villages (Sayakha, Janiadara, Sadathala, Vengani, Amleswar, and Sankhwad) have shown a negative growth trend while eleven villages have shown only one digit growth trend.

3.3.3 Socio Economic Profile

The demography, socio-economic and employment structure is detailed in the Table 3.4.

Table 3.4: Demography and Employment Structure Details

VILLAGE NAME	Total Population			Scheduled Castes	Scheduled Tribes	Literates	Main worker (Total)	Marginal Worker (Total)	Non worker (Total)
	Total	Male	Female						
Vagra Taluka									
Aragama	1021	506	515	21	295	595	344	6	671
Vorasamni	2628	1310	1318	139	598	1773	858	21	1749
Vilayat	2077	1048	1029	95	717	1055	680	9	1388
Bhersam	1361	692	669	27	770	715	614	179	568
Sayakha	835	430	405	49	354	382	392	5	438
Kothia	497	249	248	56	215	317	207	0	290
Vahiyal	1143	601	542	87	497	748	494	38	611
Pipalia	1373	710	663	23	383	1010	534	45	794
Pakhajan	1255	653	602	63	389	792	406	1	848
Nadarkha	417	215	202	35	46	271	128	95	194
Sambheti	391	205	186	14	43	161	120	123	148
Janiadara	621	314	307	31	178	428	130	273	218
Akhod	669	356	313	71	215	416	229	40	400
Nandida	683	352	331	67	221	413	265	86	332
Sadathala	210	102	108	22	130	125	72	33	105
Khojbal	1249	654	595	40	346	866	484	5	760
Bhensali	786	412	374	77	265	480	226	0	558
Atali	1145	612	533	92	437	772	315	63	767
Galenda	513	254	259	0	75	316	181	7	325
Samatpor	332	172	160	0	37	206	129	17	186
Vav	676	355	321	25	171	435	200	102	374
Jolva	814	436	378	103	170	470	291	80	443
Vadadla	606	305	301	60	320	288	236	30	340
Dahej	6846	3756	3090	365	1398	4552	2524	164	4158
Lakhigam	3357	1939	1418	79	434	2204	1618	11	1728
Luvara	1393	689	704	81	792	750	452	104	837
Jageshwar	1465	861	604	23	75	855	552	57	856
Ambheta	1330	695	635	94	199	901	369	36	925
Suva	1664	830	834	62	321	942	289	464	911
Rahiad	1315	692	623	88	80	797	356	270	689
Koliad	535	280	255	47	261	329	200	51	284
Vengani	675	352	323	0	222	351	183	199	293
Kaladara	1383	708	675	111	482	661	467	107	809
TOTAL	41265	21745	19520	2147	11136	25376	14545	2721	23997
Bharuch Taluka									
Amleshwar	1972	1051	921	109	818	817	871	31	1070
Bhuva	709	377	332	20	87	240	227	21	461
Eksal	825	422	403	38	239	341	275	120	430
Kesrol	665	351	314	58	279	313	214	158	293

VILLAGE NAME	Total Population			Scheduled Castes	Scheduled Tribes	Literates	Main worker (Total)	Marginal Worker (Total)	Non worker (Total)
	Total	Male	Female						
Navetha	853	414	439	92	290	361	264	21	568
Manad	826	403	423	202	198	466	276	43	507
Mahegam	1055	556	499	161	74	728	333	214	508
Bhadbhut	3166	1614	1552	133	896	1533	1122	165	1879
Kasva	1214	627	587	511	111	684	526	40	648
Vadva	611	295	316	21	260	277	212	0	399
Sankhavad	596	311	285	1	229	268	217	4	375
TOTAL	12492	6421	6071	1346	3481	6028	4537	817	7138

Source: Census 2001

The summary of the above table is given below:

Total Population	53,757
Scheduled Castes	3,493 (6.49% of the total population)
Scheduled Tribes	14,617 (27.19% of the total population)
Literacy Rate	58%
Sex Ratio (no. of female per 1000 males)	909
Main Workers	19,082 (35.5% of the total population)
Marginal Workers	3,538 (6.58% of the total population)
Non Workers	31,135 (57.92% of the total population)

Moreover it was found that the average household size is 5.

3.3.4 Employment Structure

The detailed employment structure of the inhabitants within the site is depicted in Table 3.5 and the significant observations with reference to employment patterns are:

- 35.5% of the total population are the main workers.
- Among the main workers, percentage of workers engaged as agricultural labour is 36.44%, and 21.66% of workers are engaged as cultivators.
- Workers engaged in household industry are only 0.67%.
- 41.22% of the main workers are engaged in other activities.

Table 3.5: Taluka wise Employment Statistics

Workforce	Bharuch District	Vagra Taluka	Bharuch Taluka
Main Worker	0	0	0
Cultivators	87905	8947	11154
Agricultural labourers	226433	13748	33041
Household Industry	8084	293	2788
Others	247781	12172	85789
Marginal Worker	34576	817	2721
Non-Worker	799901	47399	251018
Worker : Non worker	0.71	0.74	0.53

Source: Census 2001

The above information reveals that the working to non-working (dependency) population ratio is lowest in the case of Bharuch Taluka while the dependency ratio in Vagra Taluka resembles that of the district. The Welfare Society report titled “Decentralized integrated village infrastructure development and livelihood enhancement plan” has concluded that 48% youth population is potential workforce (skilled/semi-skilled) for upcoming industries within the site.

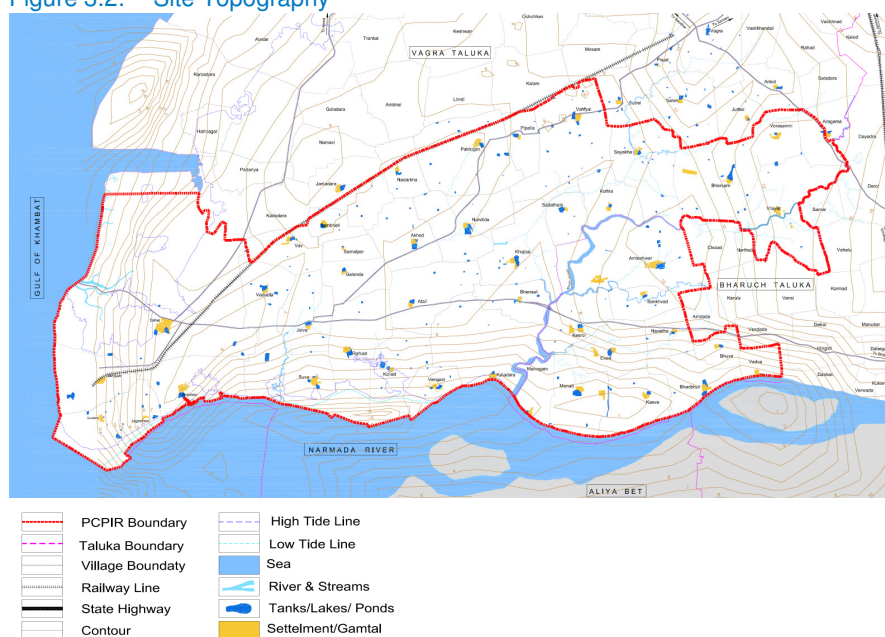
3.4 Physiography

3.4.1 Topography

The region is a flat plain extending from Zero Mean Sea Level (MSL) from the coast edge to 13 m above MSL towards the Vilayat estate. Contours along the coast are close, rising the land steeply along the coastal lines. Depressions within the flat inland surface convert into waterholes in the drainage system.

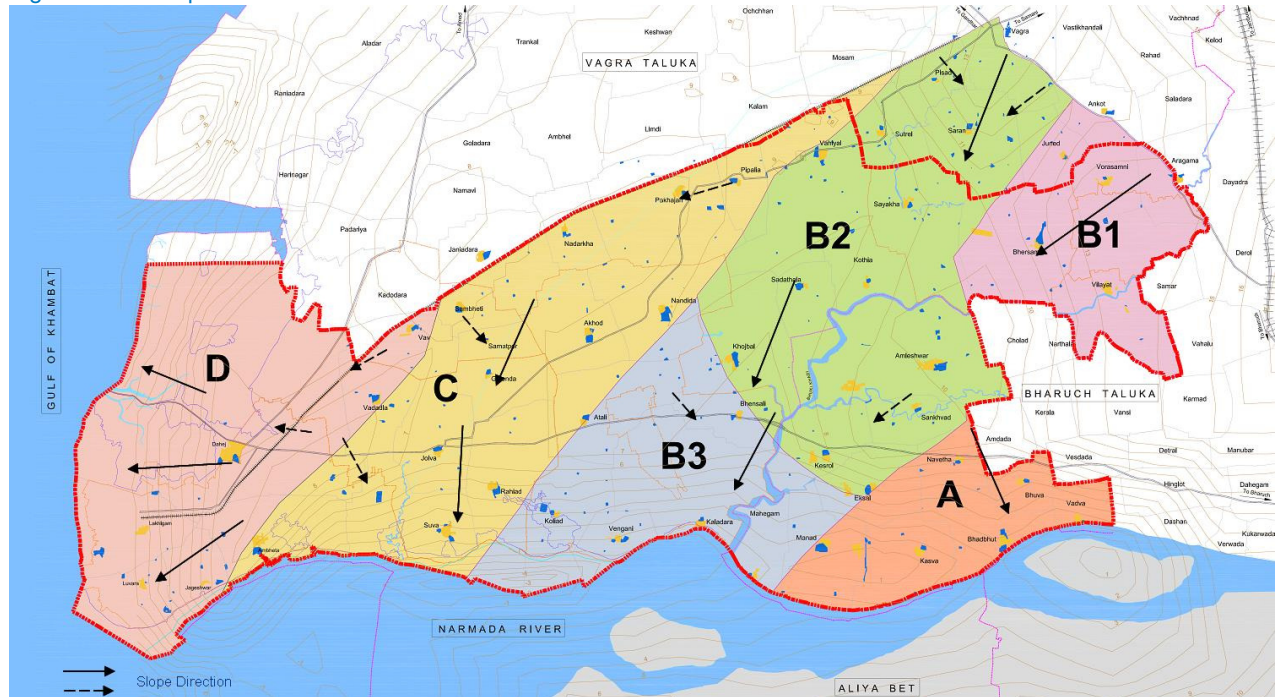
General slope of the region is in the South and West direction towards the sea. Due to older flat deposits the region has gentle slope. The area is bisected by south-westerly flowing Bhukhi River joining River Narmada. Gentle slope allow several river lets and streams forming a dicentric drainage pattern. The entire area has been divided into 3 main drainage basins on the basis of slope as given in Figure 3.3.

Figure 3.2: Site Topography



Source: Interpolation from Google Earth, March, 2010

Figure 3.3: Slope and Sub-basins



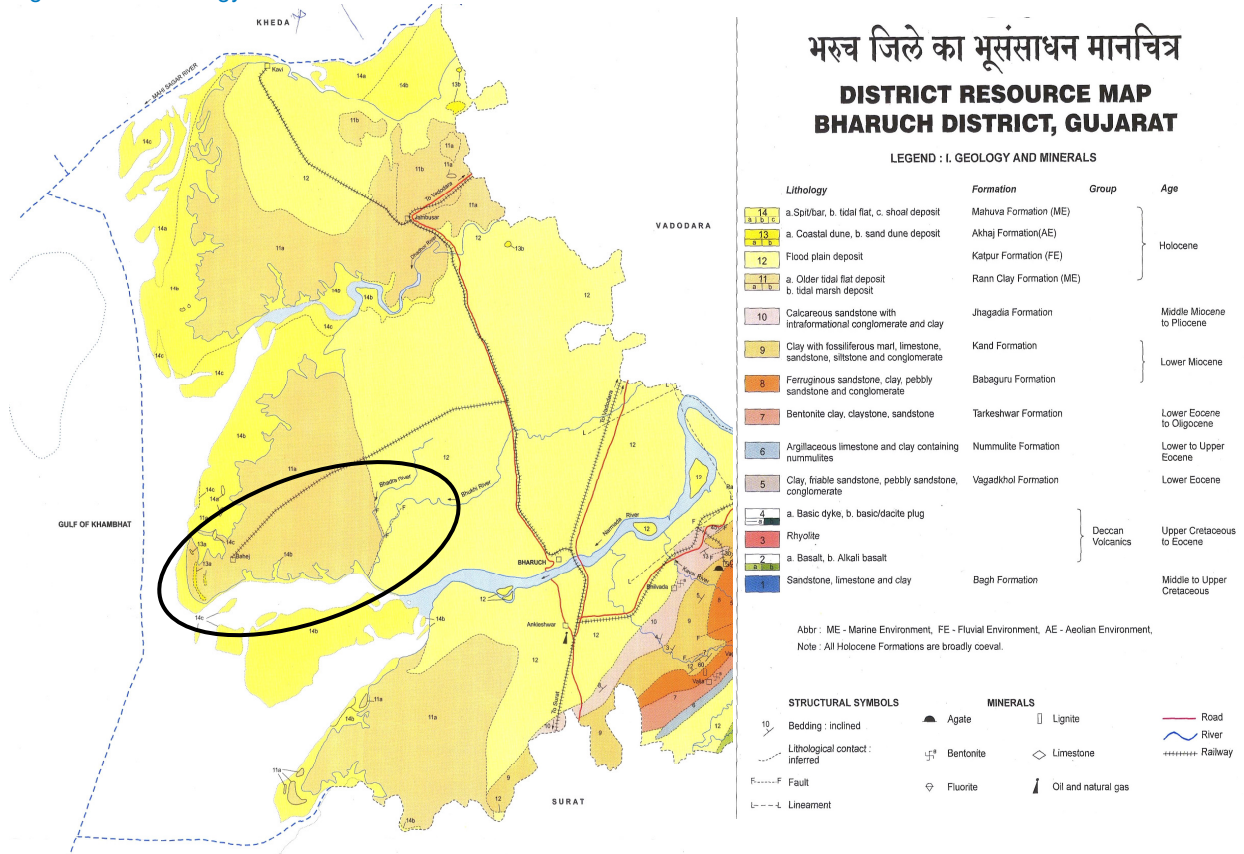
Source: FRA study in GPCPSIR Study section

3.4.2 Geology

The western half of Bharuch district has **quaternary sediments**, differentiated on the basis of environment at the time of deposit as interpreted by Geological Survey of India. The proposed site area consists of flood plains, coastal dunes and tidal features.

There is older tidal flat deposit along the coastal belt of the site area. The marginal coastal lands have geological features such as spits, bars, tidal flat and shoal deposits.

Figure 3.4: Geology and Minerals

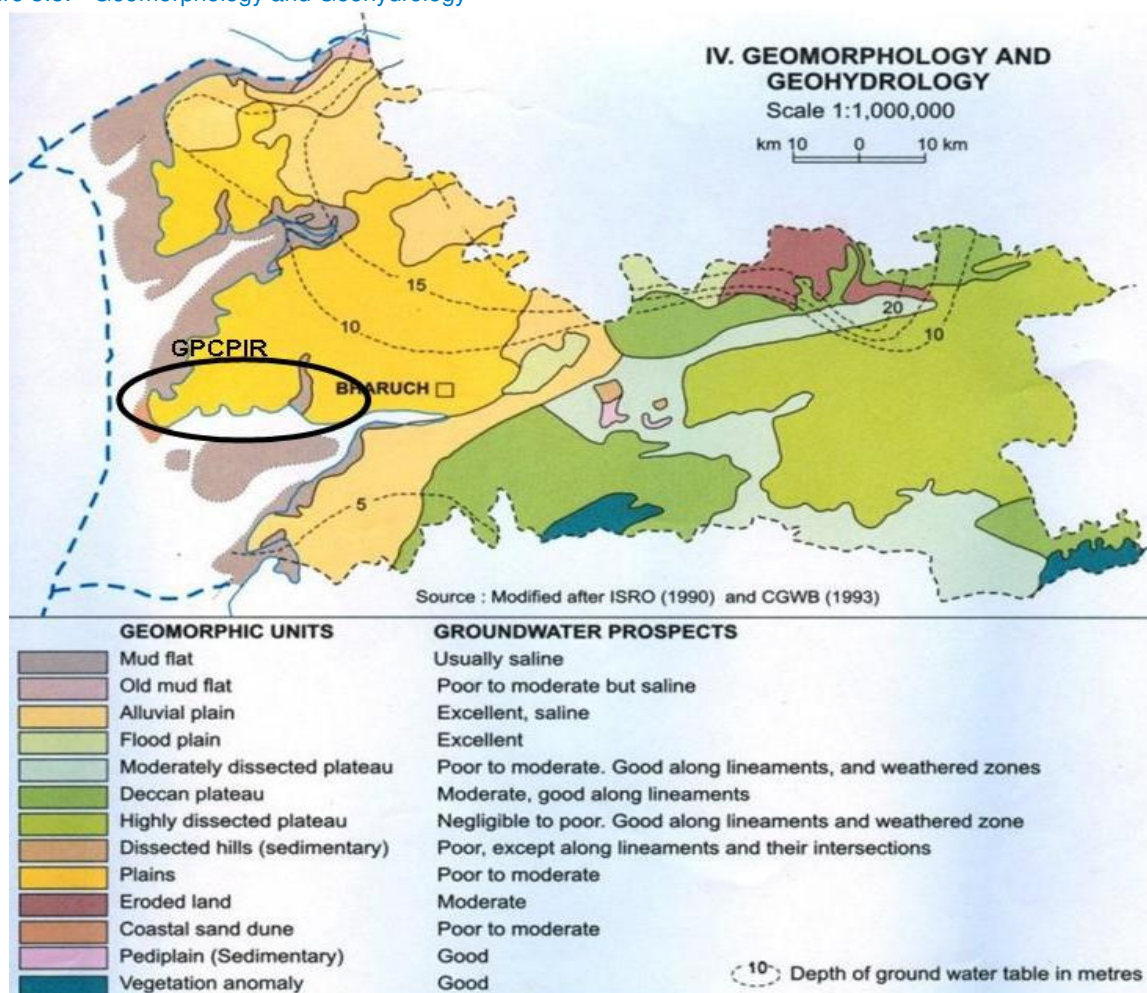


Source: District Resource Map, GSI, Gandhinagar

3.4.3 Geohydrology

As per the District resource map, depth of the ground water level at the GPCPSIR site is above 10 meters from the mean sea level (MSL). The ground water table contours around Dahej is approximately '0' level merging with the MSL³.

Figure 3.5: Geomorphology and Geohydrology



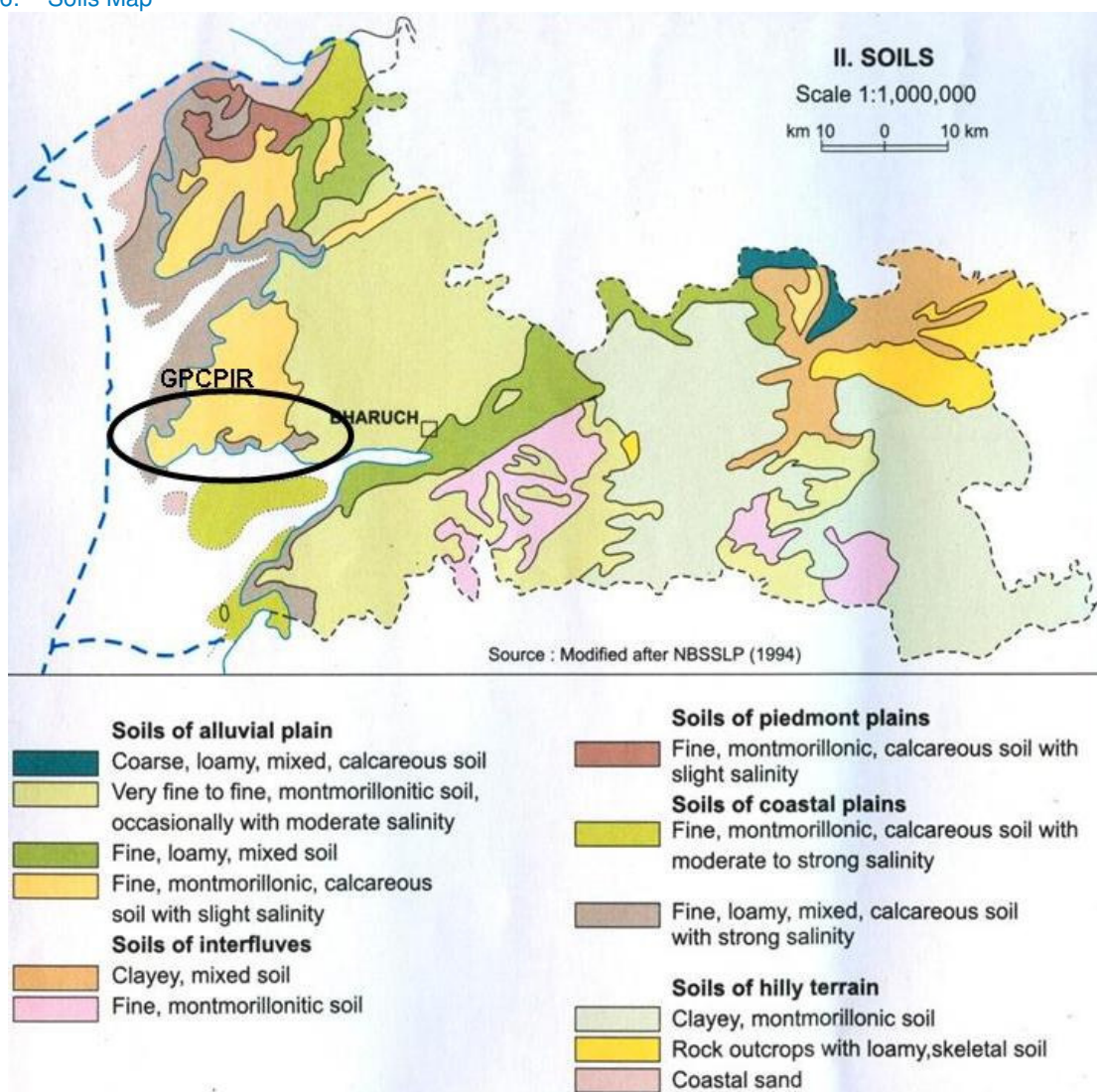
Source: District Resource Map, GSI, Gandhinagar

³ Source: Google earth image. Ground water levels, in detail, are presented in GPCPSIR studies on flood risk assessment.

3.4.4 Soils

The dominant soil type is alluvial, further categorised into fine, montmorillonitic, calcareous soil with slight salinity on the western front and very fine to fine montmorillonitic soil, occasionally with moderate salinity towards the eastern front. The coastal plains have been categorised into fine, loamy, mixed, calcareous soil with strong soil salinity. (Source: NBSSLP, 1994)

Figure 3.6: Soils Map



Source: District Resource Map, GSI, Gandhinagar

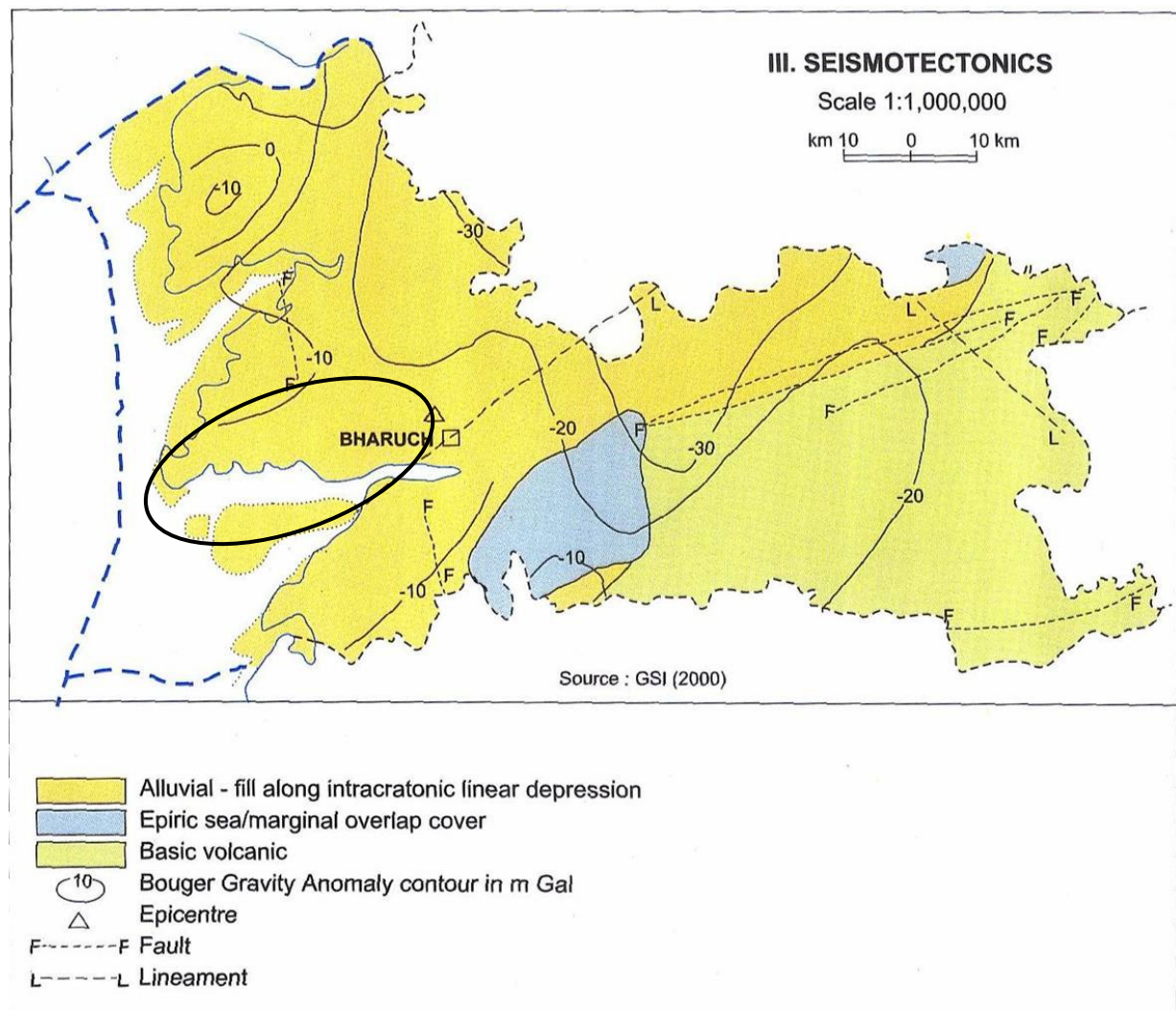
3.4.5 Coastal Tidal levels

The high tide and low tide line marked in GPCPSIR is interpreted through the satellite imagery by BISAG. Low tide line covers land along the coast while the high tide line extends to the southern GIDC industrial estate and passes across Dahej village from the west.

3.4.6 Sesmiotectonics

According to the information provided by Geological Survey of India in 2000, the site lies in the alluvial fill along the intracratonic linear depression. The Bouger Gravity Anomaly varies between - 30 to 0 m Gal. The site area lies in the **moderate risk zone (Zone-III) of Siesmicity**. A fault line in the north-south direction lies in the north of the site and earthquake epicentre is recorded in the east, close to Bharuch city.

Figure 3.7: Siesmicity



Source: Geological Survey of India, Gandhinagar

3.5 Environment

3.5.1 Climate

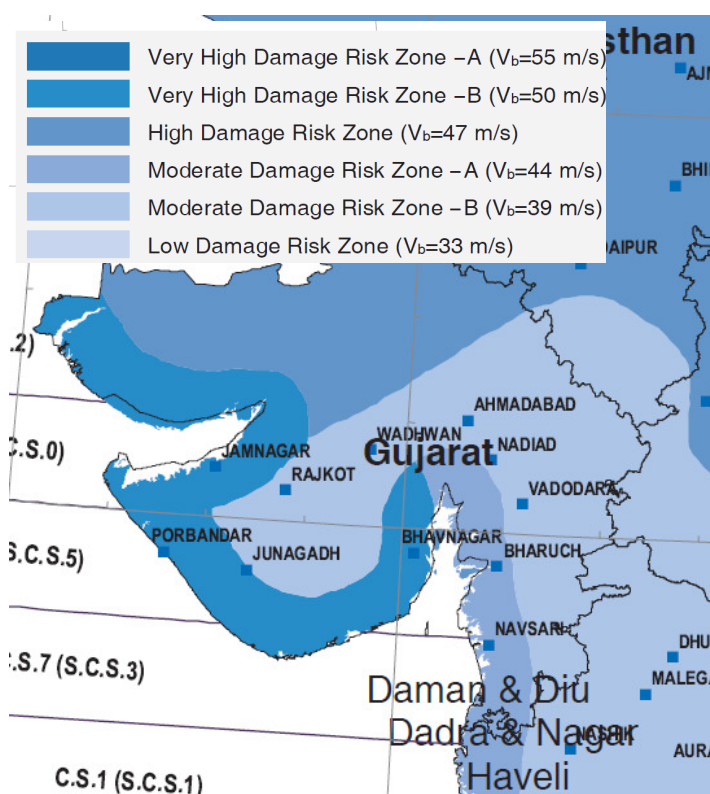
The site receives around 850 mm of rainfall annually and falls under the sub-humid zone of Gujarat. Relative humidity varies from 45 to 82%. It the site can be classified as having a typical **tropical coastal climate**.

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- **Rainfall:** The annual rainfall in the district is received during the southwest season from June to September, July being the month with the highest rainfall. The average annual rainfall of the district is about 850 mm in the year. There is evidence of large variation in annual rainfall over the past few years.
- **Temperature:** The maximum and minimum temperatures were recorded as 45°C and 14°C respectively. May is the hottest month with high mean daily maximum temperature and the mean daily minimum temperature. The temperature in June is a little higher than in May. After mid November both day and night temperatures drop rapidly till January, which is the coldest month with the mean daily minimum temperature.
- **Wind Movement:** As the temperature changes in the area the pressure pulls wind towards North-East and North-West (landwards) from October till February. In summers the wind movement is towards the Sea, majorly towards South west direction (seawards). Highest wind speed is 30 kph in the winter season⁴. Kindly also refer figure 3.8 for the month wise wind movement.
- **Cyclone:** As per the National Disaster Management Authority, Government of India, Bharuch district is categorised as a Medium risk zone. So far three cyclones have hit Bharuch's coastal line, but none have been recorded as severe. From the hazard point of view, Bharuch is shielded by Gulf of Khambat which reduces its exposure to extreme wind velocity. It falls in Moderate Damage Risk Zone-A of about 44meters/ second wind velocity. Regional wind speed and cyclone hazard map by Indian Meteorological Department IMD is shown in the figure below.
- **Tidal data:** Details on tidal level in the area of concern and also various flood levels have been elaborately discussed in chapter 5 of volume I. Also refer the detailed report on flood risk assessment done for the GPCPSIR included in volume I, section 2

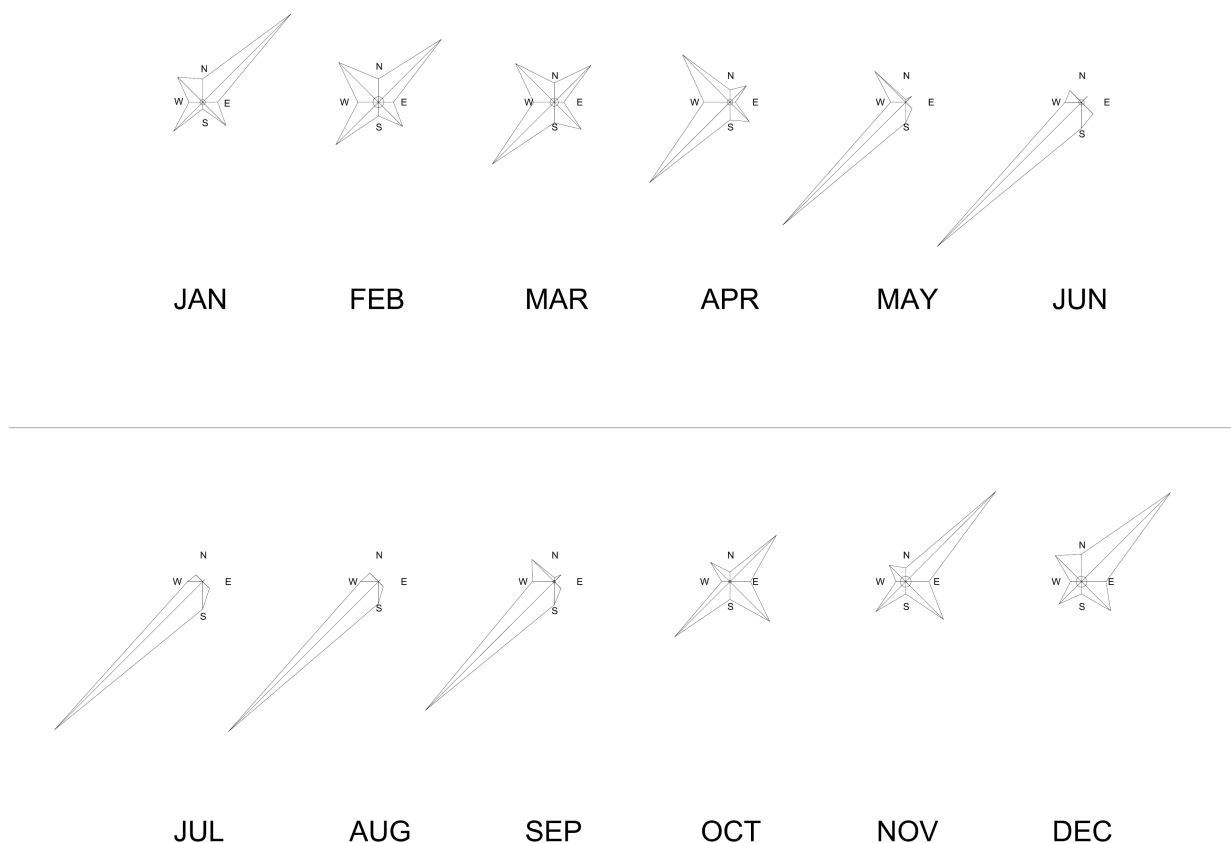
Figure 3.8: Regional wind speed and cyclone hazard map



Source: BMTPC, Vulnerability Atlas, IMD, Gol, 2005

⁴ Source: Climatological Tables, 1951-1981, IMD, Gol.

Figure 3.9: Wind Rose Diagram



Source: Climatological Tables 1951-1981, IMD, Gol

- **Visibility:** The general visibility in the area is good. Visibility in the monsoon normally deteriorates during rains and occasional squalls.

3.5.2 Ambient Air Quality

Statistical observations of the air quality, at 8 locations within the site, are given in Table 3.6.

Table 3.6: Ambient Air Quality

Monitoring stations	SPM (mg/ m3)	RSPM (mg/ m3)	SOx (mg/ m3)	NOx (mg/ m3)	CO (mg/ m3)
Ambheta	206	106	21	16	0.84
Jageshwar	251	69	12	18	0.95
Luvara	170	75	14	21	0.90
Lakhigam	260	83	18	14	0.15
Dahej	160	73	14	12	0.28
Vadadala	208	76	19	22	0.73

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Monitoring stations	SPM (mg/ m3)	RSPM (mg/ m3)	SOx (mg/ m3)	NOx (mg/ m3)	CO (mg/ m3)
Suva	231	73	12	16	0.43
OPAL	189	85	19	20	0.82

Source: OPAL EIA report (maximum observation during winter season)

The average concentration of SPM & RSPM is 105-182 $\mu\text{g}/\text{m}^3$ is higher than 100 $\mu\text{g}/\text{m}^3$ which are the threshold of the permissible limits marked by National Air Ambient Quality Standards. Carbon Monoxide is between 0.15-0.95 mg/m^3 which is well within the stipulated standards of CPCB. SOx and NOx have been observed within the limits.

3.5.3 Water Quality (Surface & Ground)

Physico-chemical characteristics of River Narmada during the winter season are shown in the Table 3.7.

Table 3.7: Water Quality: Physical Parameters

Sampling Location		pH	Temperature ($^{\circ}\text{C}$)	Turbidity (NTU)	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Conductivity (mS/cm)
Surface Water							
River Narmada (SW to Suva Vill.)	H.T	8.1	26.0	150	1050	13,080	19,900
	L.T	8.2	26.1	210	1250	5,640	8,400
River Narmada (SE to Ambheta Vill.)	H.T	8.2	26.0	180	962	15,130	22,400
	L.T	8.3	26.0	270	1540	6,180	9,500
River Narmada (SE to Jageshwar Vill.)	H.T	8.2	26.2	220	1740	17,620	25,100
	L.T	8.3	26.1	310	2010	7,060	10,600
River Narmada (Front of Luvara Vill.)	H.T	8.3	26.4	280	2130	19,320	27,300
	L.T	8.4	26.5	340	2620	8,090	11,900
Ground Water							
Village Suva		7.9	27.0	10	18	225	390
Village Vadadla		8.2	26.7	15	25	195	350
Village Luvara		7.9	26.8	8	12	710	1190
Village Ambheta		8.2	27.3	4	16	210	380
Village Dahej		8.0	27.4	6	8	1720	2650

Source: Opal EIA Report, NEERI (H.T = high tide; L.T = Low tide)

Bio-chemical characteristics levels of DO, COD, BOD were observed in the range of 5.6 to 6.4 mg/l , 10 to 28 mg/l and <3 mg/l respectively. By comparing the water quality data with the CPCB water quality criteria, the water in the tested area is class 'D' which suitable for wildlife and fisheries propagation. Treatment of this quality water is required before consumption.

Bacteriological Parameters has a significant effect on health and the coliform in the site is much higher than 5000 CFU/100ml. The sample results are given in Table 3.8.

Table 3.8: Water Quality: Bacteriological Parameters

Sampling Location		Total Coliform	Faecal Coliform CFU/100ml
Surface Water			
River Narmada (SW to Suva Vill.)	H.T	38600	256
	L.T	30182	268
River Narmada (SE to Ambheta Vill.)	H.T	48000	320
	L.T	42000	480
River Narmada (SE to Jageshwar Vill.)	H.T	46000	170
	L.T	42000	600
River Narmada (Front of Luvara Vill.)	H.T	38000	420
	L.T	38000	480
Ground water			
Village Suva		35	11
Village Vadadla		10	4
Village Luvara		98	32
Village Ambheta		280	86
Village Dahej		160	43

Source: Opal EIA Report, NEERI (H.T = high tide; L.T = Low tide)

Inorganic parameters such as alkalinity and hardness are given in Table 3.9

Table 3.9: Water Quality: Inorganic Parameters

Sampling Location		Total Alkalinity	Total Hardness Mg/l as CaCO ₃
Surface Water			
River Narmada (SW to Suva Vill.)	H.T	98	1980
	L.T	108	1190
River Narmada (SE to Ambheta Vill.)	H.T	110	2120
	L.T	112	1360
River Narmada (SE to Jageshwar Vill.)	H.T	108	2660
	L.T	98	1480
River Narmada (Front of Luvara Vill.)	H.T	120	3100
	L.T	112	1600
Ground Water			
Village Suva		152	160
Village Vadadla		120	160
Village Luvara		172	120
Village Ambheta		152	186
Village Dahej		260	806

Source: Opal EIA Report, NEERI (H.T = high tide; L.T = Low tide)

Organic compounds like oil, grease and hydrocarbons were found to be at non detectable levels both in surface and ground water.

3.5.4 Noise Environment

Noise levels of various locations within the site are given in Table 3.10. At all locations the noise levels seem to be within the respective permissible limits.

Table 3.10: Ambient Noise levels in GPCPSIR

Monitoring stations	Time (hours)	Noise level (dBA)
Residential Area		
Dahej	1330	50-53
Ambheta	1230	51-53
Vadadla	1330	42-45
Luvara	1015	48-50
Suva	0845	45-50
Commercial Area		
Dahej railway station	0945	62-66
Ambheta bazaar	1100	58-62
Industrial area		
Opal	1550	58-60
IPCL	1515	69-71
Sensitive Zones		

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Monitoring stations	Time (hours)	Noise level (dBA)
Higher secondary school, Dahej	1015	65-67
High school, Suva	1500	58-60
Middle school, Luvara	1030	63-65

Source: Opal EIA Report, NEERI

3.5.5 Biological Environment

The site falls within the jurisdiction of the Rajpipla Forest Division. As per their records, forest land is found to be in Dahej, Luvara and Lakhigam villages within the site. Forest in Luvara, Lakhigam and partly in Dahej village has been categorised as reserved forests while part forest in Dahej is yet unclassified. There is no National Park within the site. Commonly found flora and fauna within the site are given in Table 3.11.

Table 3.11: Common flora

Forest Species	Wasteland Vegetation	Ground flora	Social Forestry
Neem	Acacia nilotica	Prosopis juliflora	Azadirachta indica
Prosopis juliflora	Eucalyptus hybrid	Amaranthus spinosus	

Source: Opal EIA Report, NEERI

In fauna, common mammals such as cow, buffalo, goat, horse, dogs and donkeys have been observed. Birds like Indian myna, black bulbul, koyal, parakeet and natural scavengers are also observed.

The Client has commissioned an Environmental Impact Assessment (EIA) study for GPCPSIR, which details out the flora, fauna and ambient environment of the site. The above section on environment may be read together with the EIA document.

3.5.6 Land Environment

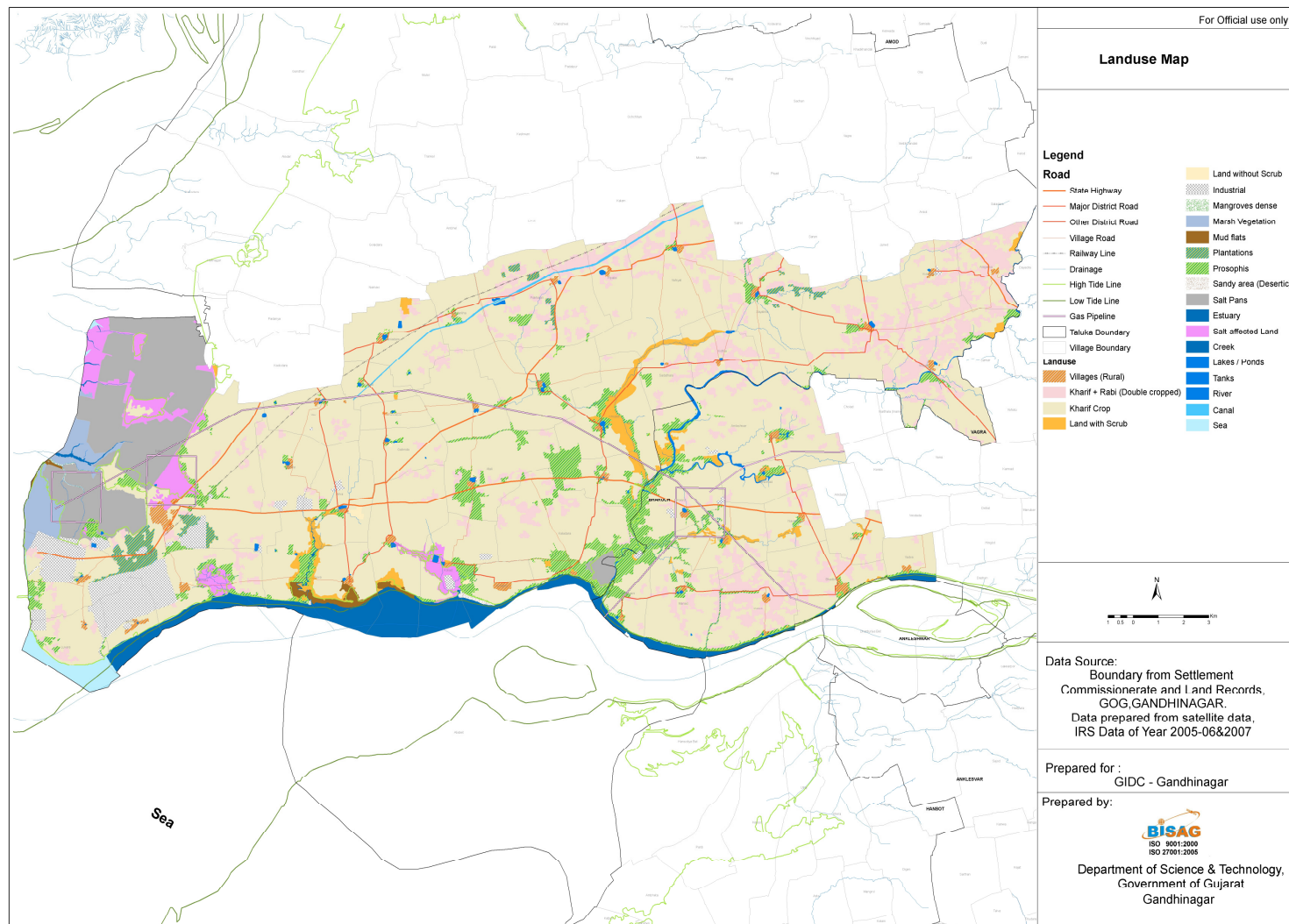
The site has been categorised as land without scrub under the cultivation of Kharif crop. Areas along the sea are either saltpans or salt affected land parcels. Creeks entering into land area is surrounded by marsh vegetation and mud flat. Plantation is observed along water bodies like rivers and creeks.

The area is basically **mono cropped** and the seasonal agricultural crops grown in this region are *cotton, tur, jowar, bajri, pulses, wheat* etc. most of which suffer from low productivity.

Figure 3.10: Agriculture practice within site



Figure 3.11: Land Environment



Source: BISAG

3.6 Connectivity

3.6.1 Existing Road Infrastructure

GPCPSIR is strategically located and well connected with the National Highways and the State Highways. The varied roads interconnecting the proposed GPCPSIR are hierarchy wise described below. Connectivity Map showing existing road network in the proposed GPCPSIR with other regions is shown in Drawing No. 245268/EI/001 in Appendix E.1

The GPCPSIR falls to the west of NH-8 which is the primary connecting link between Delhi and Mumbai. The proposed GPCPSIR is currently interlinked with NH-8 by SH-6 (Bharuch – Dahej section).

3.6.1.1 State Highway (SH)

The proposed GPCPSIR has an excellent connectivity with State Highways. SH-6 is running through the proposed GPCPSIR whereas SH-64 (Bharuch – Jambusar Road) and SH-161 (Derol – Vagra – Gandhar Road) serve the outer boundary. The SH-6 that is running through the proposed site is sub-divided into three stretches as under:

- Bharuch – Dahej Road Stretch
- Vagra – Pakhajan – Jolwa Road Stretch
- Coastal Road Stretch

The following Table 3.12 shows the details of the Existing State Highways that fall within the boundary of proposed GPCPSIR.

Table 3.12: Details of existing State Highway (SH-6) stretches within GPCPSIR

Sr. No.	Road Name	Length (Km)	Carriageway (m)	ROW (m)
1	Vagra – Pakhajan – Jolwa (Ch. 0/0 – 26/8)	26.80	5.50	24.00
2	Amod – Dahej Coastal Highway	5.54	7.00	45.00
3	Bharuch – Bhadhut	2.80	5.50	24.00
4	Bharuch – Dahej	45.80	7.00 + 7.00	45.00
5	Nadida Approach	1.80	6.35	18.00
6	Dahej – Lakhigam – Port	6.80	7.00 + 7.00	30.00, 40.00 & 50.00

Source: Bharuch R&B Panchayat Division & R&B State Highway Division

3.6.1.2 Other Roads

The proposed GPCPSIR consists of 44 villages and are interconnected with various Major District Roads (MDRs), Other District Roads (ODRs) and Village Roads (VRs). These roads are deigned, constructed and maintained by the Bharuch Roads & Buildings (R&B) Panchayat Division and State R&B Division.

The following Table 3.13 shows the details of the Existing MDRs, ODRs & VRs that fall within the boundary of proposed GPCPSIR.

Table 3.13: Details of Existing MDRs, ODRs & VRs type within GPCPSIR

Sr. No.	Taluka	Road Name	Road Type	Length (Km)	Damaged Length (Km)	Estimated Cost (Rs. Million) as per B&B Statement	Remarks
1	Vagra	Vagra Samni	MDR	2.91	0.00	N/A	Carpeting done in Year 2009
2	Vagra	Vagra – Saran – Sayakha – Vilayat – Karmad	MDR	17.90	8.00	280.00	45% Road Length Damaged
3	Vagra	Pakhajan – Nadarkha – Janiadra – Kadodara	MDR	16.05	16.05	400.00	100% Road Length Damaged
4	Vagra	Vadadala – Vav – Kadodara	MDR	8.00	8.00	200.00	100% Road Length Damaged
5	Bharuch	Amleshwar – Navetha – Bhadbhut – Kasva – Manar – Methgam	MDR	18.00	8.00	280.00	44% Road Length Damaged
6	Vagra	Nandida – Khojbal – Bhensali – Koliyad	ODR	11.00	11.00	385.00	100% Road Length Damaged
7	Vagra	Rahiyad – Suva	ODR	4.30	4.30	180.00	100% Road Length Damaged
8	Vagra	Vagra – Bhersam – Sadathal – Nandida – Khojbal	ODR	20.40	13.40	N/A	65% Road Length Damaged Sanctioned under PMGSY
9	Vagra	Narnavi – Kadodara – Vav – Jolwa	ODR	9.30	9.30	N/A	100% Road Length Damaged
10	Vagra	Bhersam – Aragam	VR	3.60	0.00	N/A	Bituminous Road OK
11	Vagra	Atali – Koliyad	VR	3.60	0.00	N/A	Bituminous Road OK
12	Vagra	Dahej – Ambheta – Jageshwar	VR	3.50	3.50	100.00	100% Road Length Damaged
Total				118.56	81.55	1825.00	68.78% Road Length Damaged of Existing MDR, ODR, VR

Note: MDR & ODR ROW generally taken as 18m & Carriageway taken as 3.75m to 5.50m

VR ROW generally taken as 12m & Carriageway taken as 3m

From the above table, it is clear that 68.78% of the total 118.56 Km. road length is damaged and/or in deteriorated conditions and requires immediate repairs. Specifically, the road sections in Khojbal – Kothia – Sadathala stretch, Jolwa – Vav – Kadodara – Narnavi stretch, Rahiyad – Suva stretch, Nandida – Khojbal – Bhensali – Koliyad stretch were found damaged and other stretches found flooded during the site visit. In the year 2009, all these damaged/deteriorated road sections have been proposed for strengthening & widening by the Bharuch R&B Panchayat Division.

3.6.2 Existing Rail Infrastructure

The proposed GPCPSIR is located in the close proximity to the Dedicated Freight Corridor (DFC) running along the Delhi – Mumbai Railway line which is one of the busiest routes of the Western Railways (WR). At

present, the proposed GPCPSIR is connected with Bharuch, a major station on the Delhi – Mumbai line, from Dahej, an upcoming major industrial region. Connectivity Map showing existing Railway network in the proposed GPCPSIR with other regions is shown in Drawing No. 245268/EI/001 in Appendix E.1

3.6.2.1 Bharuch – Dahej Narrow Gauge (NG) Railway Line

The proposed GPCPSIR is connected with the Western Railways network through Bharuch – Dahej Narrow Gauge (NG) railway line. The existing railway line is a 62.36 Km. long single line connecting Dahej, Vagra and Bharuch and forms a semi-triangular boundary in the northern side of the proposed investment region.

3.6.2.2 Railway Projects

Bharuch – Dahej NG Rail Line to BG Conversion & Extension of Bharuch – Samni Railway link line till the Ports/Jetties

Bharuch – Dahej Railway Company Limited (BDRCL) is an SPV formed for the purpose of converting the Bharuch – Samni – Dahej Narrow Gauge (NG) railway line to Broad Gauge (BG).

The project has been identified as an important Port Connectivity and Gauge Conversion Project under the National Rail Vikas Yojana (NRVY) launched in December 2002.

Figure 3.12: NG to BG conversion work in progress



MM-Site Visit

The project involves conversion of 62.36 Km long Bharuch – Samni – Dahej Narrow Gauge Railway line to Broad gauge, so as to provide Broad Gauge Rail Connectivity for Passenger and Freight Traffic movement between Bharuch and Dahej. An additional 5.2 Km link line shall be built to connect with the WR Mainline at Chavaj (north of Bharuch) owing to space constraints at Bharuch. Dahej, the terminal station, of the line shall be linked by sidings to the proposed new jetty being constructed by the Adani Petronet (Dahej) Port Private Limited is expected that there will be demand for additional sidings, including one to a Logistics Park. The project line at its eastern end shall join the existing Western Railway mainline from Virar to Vadodara at Bharuch and Chavaj. Provision shall also be made for junction arrangements with the Western Dedicated Freight Corridor as and when it comes up. As the line is categorized as a feeder route to the Dedicated Freight Corridor (DFC), the line is designed to take a heavier axle load of 25 tonnes involving use of heavier rails. The line shall be electrified to 25 KV AC traction standards to facilitate interchange of traffic with Western Railway. The Bharuch – Dahej Broad gauge Railway line is targeted to be ready by end of 2010 (Refer Table 3.14 and Figure 3.12 & Figure 3.13)

Table 3.14: Expected Traffic in Bharuch – Dahej New BG line

Commodity	2011-12	2015-16	2019-20	Lead
Coal	3.25	4.50	4.75	257.00
Fertilizer & Farm	1.10	1.40	1.60	772.00
D-Oil Cake	0.50	1.00	1.50	550.00

Commodity	2011-12	2015-16	2019-20	Lead
Steel	0.12	0.30	0.30	1678.00
Total	5.17*	7.55*	8.55*	

Source: Bharuch Dahej Railway Company Limited (BDRCL)

*Does not include containerized traffic

Freight Corridor

In the Railway Budget 2006-2007, a proposal for constructing a 1,469 km-long dedicated Multimodal High Axle Load Freight Corridor with computerised control on the golden quadrilateral has been put forward by the Ministry of Railways, GoI. The Western corridor will start from Jawaharlal Nehru Port Trust (JNPT) and will be routed via Vadodara, Ahmedabad, Palanpur, Jaipur and Rewari to Tuglakabad and Dadri. The feeder Route of Dahej- Bharuch BG line will link to this freight corridor at the access points on the freight corridor.

A Logistics Park is being considered at the access points of the freight corridor within Bharuch, by the Gujarat Government. This project would be in line with the Freight Corridor Alignment, a feasibility study for which has been done and further work would be taken up once the alignment is finalised.

3.6.3 Existing Port Infrastructure

3.6.3.1 Existing Sea Port

Under the Port Policy of Government of Gujarat, all-weather ports are developed at Dahej for large ocean liners (panamax & post panamax vessels). Also, some of the ports are under phase wise development. 18m of draft is available at a distance of 2 Km. from the shore line in order to cater these ocean liners. These ports/jetties are developed and being developed under the Joint Sector Commercial Jetties and Private Sector Commercial Jetties medium. Gujarat Maritime Board (GMB), a government of Gujarat wing, owns and manages lighterage port and is a current stakeholder of one of the joint Sector Commercial Jetties. The Board has concrete plans and has identified developers for auxiliary port development at Dahej. The solid cargo handling capacity for the commercial usage is 1.00-2.00 MMTPA. The liquid cargo handling capacity for the commercial usage which currently is 1.80 MMTPA is proposed to be increased to 3.80 MMTPA. All the other jetties are for restricted/private usage. The details of the existing ports/jetties at the shoreline of the proposed GPCPSIR are shown in Table 3.15 and Figure 3.17.

Figure 3.13: ONGC jetty in Gulf of Khambat



Source: MM

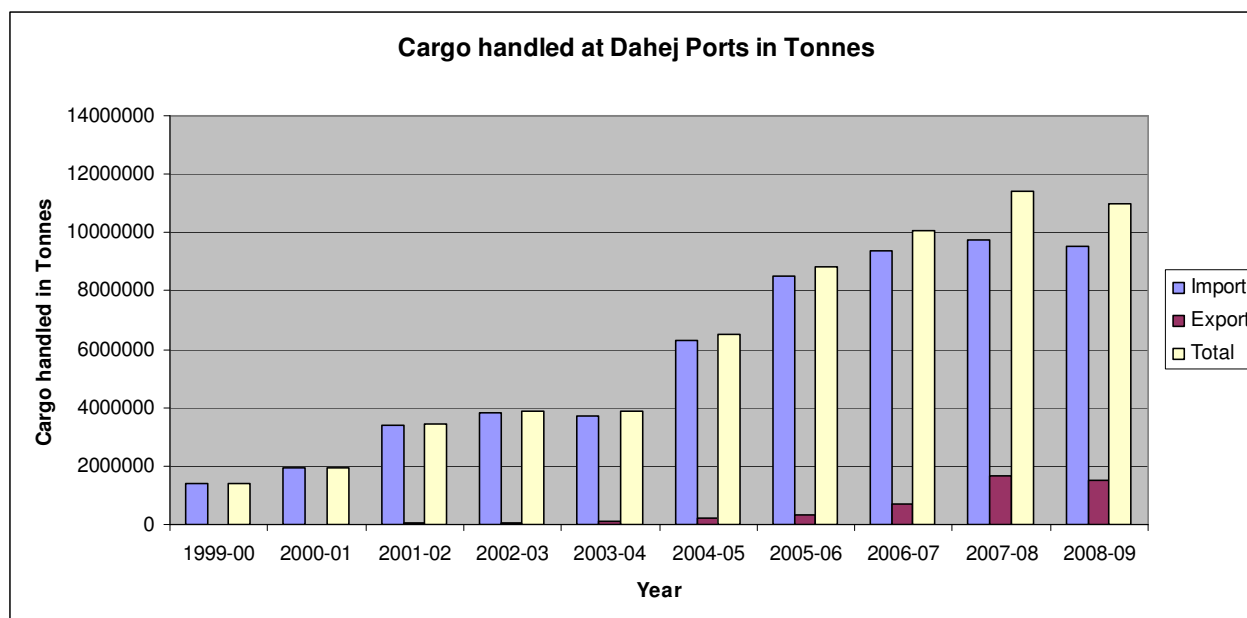
Table 3.15: Details of the Existing Ports/Jetties at shoreline of the proposed GPCPSIR

Sr. No.	Name of Company	No. of Berth(s), Jetty Details	Type of Ownership	Commercial Usage	Type of Materials Handled	Capacity (MMTPA)	Future Expansion (MMTPA)
1	BIRLA COPPER	1, Berthing Capacity of vessel up to 70,000 DWT in fair weather. Can Handle Gearless Vessel, Daft	Private Sector Captive Jetty	Allows 1-2 MMTPA Commercial Usage	Copper smelter and fertilizer as well as its raw materials	4.50	5.00 (1 berth)

Sr. No.	Name of Company	No. of Berth(s), Jetty Details	Type of Ownership	Commercial Usage	Type of Materials Handled	Capacity (MMTPA)	Future Expansion (MMTPA)
Available 15 m							
2	GCPTCL	1, Jetty with a Height of 20 MDRs above Chart Datum and a large service platform accommodating seven unloading / loading arms, etc., which can cater to ships of various sizes, makes & standards.	Joint Sector Port/ Terminals	Built for Commercial Usage	Hazardous liquid & gaseous chemicals	1.80	2.00 (1 berth)
3	PETRONET (LNG)	1, Length: 360M Approach trestle: 2400M	Joint Sector Port/ Terminals	Only for stakeholders	Liquefied Natural Gas	5.00	5.00 (2 berths)
4	IPCL	1, Length: 49 m Draft: 5m	Private Sector Captive Jetty	Only for stakeholders	Liquid fuel	3.50	-
5	OLD PORT DAHEJ	1, Jetty length is 104.00 meter, The jetty is designed to cater the vessel of 3.00-meter draft. The anchorage draft is 16.00 m.	Government Owned -GMB	Built for Commercial Usage	General Cargo	0.30 (Negligible)	DPRs being made Restoration of approach road, Shore protection, Green belt, Drinking water line, Fire fighting line, Port security wall, Electric illumination
Sub Total		5 Berths				15.10	12.00 (4 Berths)

Source: GMB, Bharuch & Gandhinagar

Figure 3.14: Cargo handled in Dahej ports



Source: GMB

3.6.3.2 Sea Port Projects

Table 3.16 gives the description of the ongoing ports/jetties development projects which are proposed by Gujarat Maritime Board (GMB) looking at the large scale development in the region. Also, there are further plans of developing solid cargo and liquid cargo handling ports/jetties in order to boost the cargo handling capacity to 50 MMTPA.

Table 3.16: Ongoing Port/Jetties Projects in Dahej

Sr. No.	Type of Cargo	Location	No. of Berth(s)	Type of Ownership	Type of Materials Handled	Proposed Capacity (Phase I) (MMTPA)	Future(Phase-II) Expansion (MMTPA)
1.	General Cargo Port (Petronet Adani)	North of Petronet Jetty- Under Construction	2	Government- GMB	General Cargo	3.5	4.5 (1 Berth)
2.	Port Facilities plus Container Berth	North of Birla Copper Jetty	Yet to be assessed	Sandesara Group having technical collaboration with Virginia Port Authority, USA.	Liquid and Solid cargo	Being Assessed	Being Assessed

Source: GMB , Gandhinagar

3.6.3.3 Other Projects by Gujarat Maritime Board (GMB)

- GMB along with GIDC has plans to develop the long stretch of the riverside into port based activities which may require capital for dredging for maintaining a draft of 3-4m. A single point mooring may also be established.

- A Roll-On Roll-Off (Ro-Ro) ferry service connecting Dahej and Ghogha Bunder (Saurashtra) is being planned from the GMB area near Jageshwar by the Gujarat Government at a cost of Rs 650 million. For this purpose, about 13 hectares of land has been acquired from GIDC in the year 2007-08.
- M/s. ABG Shipyard Limited is setting up a modern shipyard at Dahej to set up a modern ship building/repair yard for big size vessels on upstream of IPCL Jetty near Jageshwar. All infrastructures are on the verge of completion and would be fully functional within 6 months period. Size of ships to be built ranges up to 120,000 DWT. ABG Shipyard has already started building various size vessels and bunker barges at this yard.
- Presently, there is no container terminal in GPCPSIR area and GMB is conducting a feasibility study for the same. At Hazira, Shell Group has signed a MoU with Singapore Port Authority for the container Terminal at Hazira which is at a distance of 60 nautical miles from Dahej. GMB and GIDC plans to develop a feeder container terminal at Dahej, if a Container Port is not found feasible. This will facilitate the use of the container terminal at Hazira.

3.6.4 Existing Airport Infrastructure

The nearest airports to the proposed GPCPSIR are at a distance of about 90 Km. located in Vadodara and Surat. The nearest International Airports are located in Ahmedabad and Mumbai.

3.6.4.1 Airport Projects

1. **Modernisation of Ahmedabad Airport:** Modernisation of Ahmedabad International Airport has been initiated by the Airport Authority of India (AAI) at a total cost of Rs 1750 Million.
2. **Expansion of Surat Airport:** Airport Authority of India has commenced the expansion of Surat Airport at a cost of 350 million.
3. **Airstrip at Ankleshwar:** The Government of Gujarat (GoG) has acquired 44 hectares of land for an airstrip at Ankleshwar which is 6 kms from Bharuch, close to NH-8 and to be built at an estimated cost of Rs 20 Crores. A private developer has committed to develop this airstrip.

3.7 Existing Utilities and Physical Infrastructure

3.7.1 Existing Water Supply Infrastructure

The primary source of raw water for the proposed region is Narmada River and its tapping point is based at Nand Village located at a distance of 50 Km. from the estuary. The river water is found to be highly saline due to the tidal effect up to 30-40 km upstream from the estuary. The Nand Village has raw water intake points for the government as well private agencies such as GWSSB, GIDC, ONGC and Reliance (IPCL) to cater the industrial and domestic water demand of the existing industries as well as villages present in the proposed region. Refer Figure 3.15 for intake wells location.

Figure 3.15: Intake Wells of GIDC, IPCL & ONGC



Source: MM-Site Visit

3.7.1.1 Gujarat Water Supply and Sewerage Board (GWSSB)

Gujarat Water Supply and Sewerage Board (GWSSB), is primarily responsible for water supply and sanitation facilities in the rural areas (primarily villages) of the state. The Central Zone Bara Track (CZBT) Water Supply Scheme covers total 105 villages of Bharuch, Vagra and Amod Taluka of which 44 villages (coming under the administrative boundary of Bharuch and Vagra Taluka) fall in the proposed GPCPSIR.

Under this scheme, tube wells were the source of raw water which was in action by the year 1972-73. During the course of time, the ground water got depleted and in order to meet the water demand, surface water tapping source were planned. In the year 1993, an intake well with capacity of 32 MLD was constructed on Narmada river bank near Nand Village along with water treatment plant at Palej considering the suitability of the location. The network consisted of 14 intermediate Headworks and supplied 7.5 MLD water to all the 105 villages. During the course of time, this network has reached its lifecycle and is heavily damaged at certain locations. GWSSB has planned to revive the existing network and replace the damaged sections. The details of the Headworks under the CZBT Scheme are shown in Table 3.17.

Table 3.17: Head Works Details in CZBT Scheme

Sr. No.	Name of Head Work	Villages (Nos.) in Taluka			Total Villages (Nos.)	Storage Details			Pump House Area
		Vagra	Bharuch	Amod		Capacity (lakh-litres)	ESR Height (m)	Sump Capacity (lakh-litres)	
1	Sudi – Aura	18	4	1	23	4.50	12.00	20.00	(4.50 x 5.00)m
						4.50	10.00	-	-
						2.00	5.00	-	-
2	Tanchha	0	0	1	1	-	-	32.00	(8.00 x 4.00)m
3	Pakhajan	25	0	0	25	4.50	16.00	4.50	(6.00 x 4.00)m
						-	-	-	-
						2.00	15.00	3.00	(5.00 x 4.00)m
4	Rahiyad	7	0	0	7	2.25	17.00	3.00	(6.00 x 4.00)m
5	Nava Vadila	5	0	0	5	2.00	15.00	3.00	(3.00 x 3.00)m
6	Bhensali	2	0	0	2	-	-	0.30	(3.00 x 3.00)m
Total		59	4	2	65				

3.7.1.2 Gujarat Industrial Development Corporation (GIDC)

Gujarat Industrial Development Corporation Limited (GIDC) acts as a catalyst cum backbone for industrial development. GIDC identifies suitable areas for industrial development as well as creates tailor-made land parcels for entrepreneurs' needs. It provides all the necessary infrastructure facilities necessary for the development of these areas. In the proposed GPCPSIR, GIDC is supplies water to existing industrial establishments in Dahej and Vilayat estates of Bharuch district.

GIDC has tapped raw water from Narmada river at two locations, i.e. at Nand Village (near GWSSB intake well) and at Angareshwar Village. The average distance between tapping point and Dahej estate ranges between 50-60 Km. The current water drawing capacity is 33 MGD (8 MGD at Nand Village and 25 MGD at Angareshwar Village).

3.7.1.3 Indian Petrochemical Corporation Limited (IPCL)

Indian Petrochemical Corporation Limited (IPCL) is one of the pioneering petrochemical organizations in India, which is now a part of the Reliance Industries Limited (RIL). Like GWSSB and GIDC, IPCL has its raw water intake wells at Nand Village along with water treatment plant having total capacity of 20 MGD.

At present, only 8 MGD of water is drawn from the 20 MGD capacity unit. The 20 MGD unit would draw water at full capacity to cater the future water demand.

3.7.1.4 Oil and Natural Gas Company (ONGC)

Oil & Natural Gas Company Limited (ONGC) holds the largest share of hydrocarbon acreages in India and contributes to over 80% of Indian oil and gas production. ONGC has its own water supply network with raw water intake well along with water treatment plant at Nand Village.

The overall existing water supply intake wells tapping raw water from the Narmada River for the proposed GPCPSIR is shown in Table 3.18. Also, the existing water supply network map is shown in drawing No. 245268/EI/002 and is attached in Appendix E.2.

Table 3.18: Existing water supply

Sr. No.	Water Supply Authority	Intake Well Capacity in MGD	Location of Intake Well	Area Covered
1	GWSSB	32.00	Nand Village	Domestic Use
2	GIDC	8.00	Nand Village	Industrial Use
		25.00	Angareshwar Village	Industrial Use
3	IPCL	20.00	Nand Village	Captive Source
4	ONGC	N/A	Nand Village	Captive Source

3.7.1.5 Narmada Canal

Narmada Main Canal is the biggest concrete – lined contoured irrigation canal in the world with length of about 458 Km. The branch canal network is spread across the district of which the Denva branch canal irrigates 8 villages of Vagra Taluka while the Luvara branch canal irrigates to major regions of the proposed GPCPSIR. The Luvara branch canal is further distributed into five tributary canals namely, Luvara, Kaladara, Rahiad, Koliad and Dahej. At present, the Miyagam branch canal and the Vadodara branch canal supply water to the Bharuch district. The existing condition of the Luvara Branch Canal is very dilapidated and needs immediate repairs and strengthening works. The existing Narmada branch canal network is shown in drawing No. 245268/EI/005 in Appendix E.5

The proposed GPCPSIR covers area between Dahej and Vilayat estates along with 44 villages coming under the Vagra and Bharuch Taluka. The region is sparsely populated and provides negligible job opportunities in the primary sector due to limited agricultural potential. As a result, a very limited level of basic infrastructural facilities such as sanitation infrastructure is provided in these villages. Most of these

villages lack sanitation facilities where the waste water is allowed to flow in the open areas. Some of the villages' residents have septic tanks and soak pits as the only available sanitation infrastructure. The existing industrial establishments have developed the sanitation infrastructure which is limited to their usage and discharge the domestic sewerage in the effluent treatment facility developed for industrial usage.

3.7.2 Existing Effluent Management Infrastructure

Bharuch district's western area has limited agricultural potential due to its proximity to the sea. Also, the population in this region is sparse and provides negligible job opportunities in the primary sector. Presence of India's first LNG terminal in addition to a modern chemical handling terminal at Dahej gives this region very high potential for the development of Petrochemical, Chemical, and Pharmaceutical Dyes and Intermediate Manufacturing units. Also, Dahej and Vilayat industrial estates have been developed in this region which provides an ideal platform for the development of these industrial units. Gujarat Industrial Development Corporation (GIDC) is the nodal agency responsible for the rapid and organized growth of the industrial units by providing supporting infrastructure facilities including effluent management of the industrial units in this region. At present, the existing industrial units have their own effluent treatment plant as there is no common effluent treatment facility in the proposed region.

In order to serve this purpose, GIDC has laid 55 Km. long marine disposal line with a carrying capacity of 90MLD initiating from Vilayat of which 65 MLD is dedicated to Dahej industrial estate whereas 25 MLD is dedicated to Vilayat industrial estate. The details of the pumping stations at Vilayat and Dahej industrial estates are shown in Table 3.19.

Table 3.19: Existing Effluent Pumping Stations Details

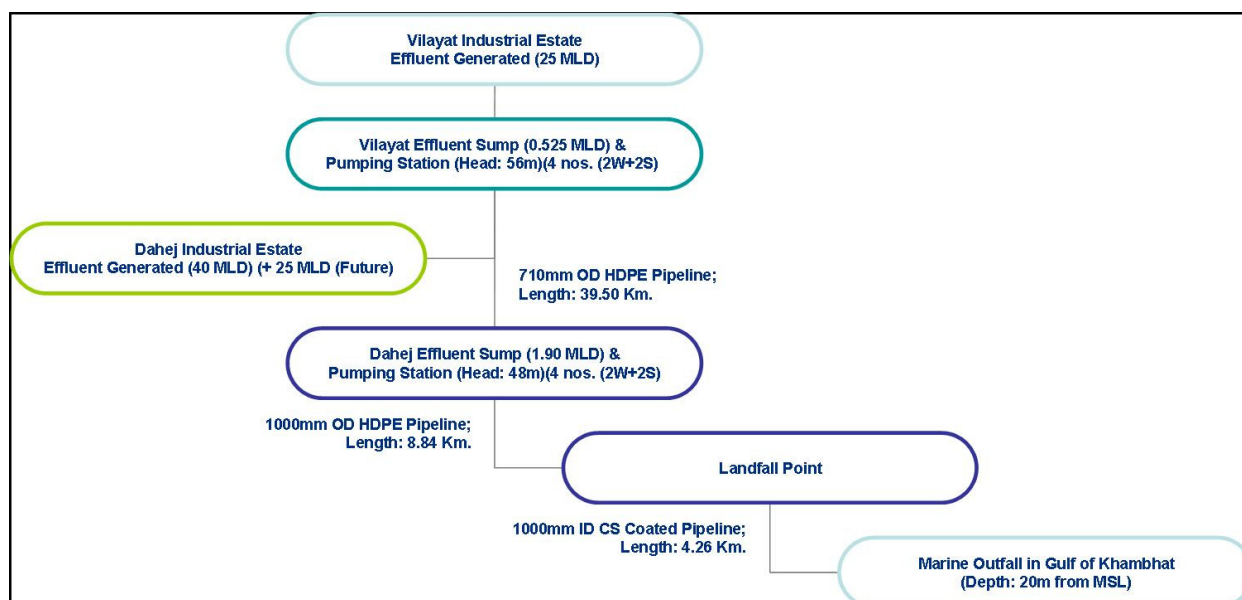
Sr. No.	Pump Details	Vilayat Pumping Station	Dahej Pumping Station
1	Capacity (MLD)	25.00	65.00 (40+25(future))
2	Pump (Nos.)	4 (2W+2S)	4 (2W+2S)
3	Head (m)	56.00	48.00
4	Pipe Dia. (OD) (mm)	710	1000
5	Pipe Type	HDPE	HDPE
6	Pipe Length (Km.)	39.50	8.84

The total capacity of the marine outfall is proposed to be 180 MLD (90 MLD each in Phase-1 & in Phase-2). The marine outfall's diffuser (21039'26" N, 72029'50"E) is located at the depth of approximately 20m from the mean sea level and at a distance of 4.262 Km. from the landfall point. The total effluent capacity distribution for Dahej and Vilayat industrial estates including the future demand is shown in Table 3.20

Table 3.20: Total Effluent Demand in Dahej & Vilayat Estates

Sr. No.	Industrial Estate	Phase 1 (MLD)	Phase 2 (MLD)
1	Dahej	40.00+25.00	65.00
2	Vilayat	25.00	25.00
Total Effluent Disposal (Phase wise)		90.00	90.00
Total Effluent Catered (MLD)		180.00	

The methodology of the existing effluent management and disposal system is shown as under.



The existing effluent disposal line layout was collected from GIDC and superimposed on the proposed GPCPSIR base map and is shown in the Drawing No. 245268/EI/003 in Appendix E.3

3.7.3 Existing Solid Waste Management Infrastructure

The proposed GPCPSIR is spread over an area of around 453 Sq.Km. The region is very sparsely populated and does not have significant domestic waste generation and disposal facilities in the proposed GPCPSIR. The proposed region does not have any solid waste management facilities for domestic waste collection, treatment and disposal into landfill sites. The generated waste is also disposed in the open which creates serious hazard to health and environment along with unpleasant surroundings.

The industrial and domestic waste generated during the production is managed by the respective existing industrial establishments. Majority of these industrial establishments dispose non-recyclable solid waste to BEIL (Ankleshwar) and GEPIL (Surat). The hazardous non-recyclable solid wastes are incinerated while the industrial non-hazardous non-recyclable solid wastes are disposed in landfill sites under public-private participation (PPP) with private operator.

Other recyclable solid/liquid wastes such as drums, spent oil, polymer liners, etc. are sent to GPCB approved re-processors for recycling whereas fly ash from the captive power plants is sold to cement manufacturing plants. The industrial waste generation and disposal pattern of Bharuch District is given in Table 3.21

Table 3.21: Existing Solid Waste generation

Process	Landfill	Recyclable	Incinerables
Waste MMTPA	0.304	0.114	0.048
% of Total	65.24	24.46	10.30
No. of Industries			747

3.7.4 Existing Storm Water Management Infrastructure

Storm water can immensely disturb normal business in absence of proper disposal system. There is no systematic storm water drainage facility available in the GPCPSIR area except inside the individual industries. However, most of the industries in the area have their own storm water drain system, which collects the storm water and dispose off into either ETP or captive drenches.

The rainwater drains out through the natural drain system to the low lying areas or the ponds available within the village area. For an infrastructure facility in GPCPSIR Region, which experiences an average annual rainfall of between 250 mm. to 1300 mm, scientific collection and disposal of storm water, shall form an important feature. The average rainfall intensity for the project area for the return period of 10 year and 100 year is found to be around 10 mm/hr and 20 mm /hr respectively.

3.7.5 Existing Power Supply Infrastructure

Power supply plays a very important role in the industrial growth and development. In the proposed GPCPSIR, Dakshin Gujarat Vij Company Limited (DGVCL) and Torrent Power are the responsible authorities for supplying electricity to most of the industries. However, industries like Meghmani and Gujarat Alkalies & Chemicals Limited (GACL) have their own captive power plants. The details of the existing power supply network are shown in the Drawing No. 245268/EI/004 in Appendix E.4.

3.7.5.1 220 kV Dahej Substation

There is a single unit of 220/66 kV substation at Dahej with two incoming lines from Vagra – Dahej 220 kV and Haldarwa – Dahej 220 kV. The installed capacity of transformer is a single unit of 100 MVA. Dahej 200 kV Substation supplies electricity its surrounding industries. Its major consumers are the Gujarat Alkalies and Chemicals Ltd. (GACL), Hindalco Industries Ltd. (previously known as Indogulf), Gujarat Fluorochemicals Ltd. It also supplies power to industries like LNG Petronet Ltd., Torrent Power and other rural feeders.

3.7.5.2 66 kV Dahej Substation

There is a single unit of 66/11 kV substation at Dahej with incoming line from 66 kV Bhensali substation. There are total three units of 10 MVA transformers of which two transformers are in operation while one transformer would be commissioned shortly. The 66 kV substation supplied electricity to industries like BASF and GCPTCL. All the other feeders act as rural feeders supplying electricity to nearby villages.

3.7.5.3 220 kV Vilayat Substation

There is a single unit of 220/66 kV substation near GIDC, Vilayat with incoming line from Haldarwa – Dahej 220 kV. The installed capacity of transformer is of 50 MVA. This substation has been commissioned to meet power demand by industries within GIDC, Vilayat.

3.7.5.4 66 kV Vilayat Substation

There is a single unit of 66/11 kV substation at Vilayat with incoming lines from Palej – Vagra 66 kV and Bharuch-B – Vagra 66 kV substations. The installed transformers are single units of 10 MVA and 5 MVA capacities. Electricity is imported from Gandhar CPF to 66 kV Vilayat substation through ONGC Line1 &

Line 2. This electricity is further exported to 11 kV substations, to supply electricity to GAIL and to all other rural feeders serving villages.

Also, GETCO would setup a single unit of 220/66 kV substation near Suva village specifically to meet the power demand. The electricity would be tapped from Gavasad – Kosamba 220 kV line with installed capacity of two units of 100 MVA transformers. As per the stakeholders' consultation, it would take approximately 36 months for setting up and commissioning of single 220 kV substations. There would be two units of 66 kV substations placed at different locations and would be fed from the 220/66 kV Suva substation. The stated substations might not be adequate to meet the power demand of the industries coming in the proposed GPCPSIR. Although, electricity could be used from these substations provided surplus power is discovered.

3.7.6 Existing Oil and Gas Supply Infrastructure

ONGC has the license to undertake oil & gas exploration in this region. Its work is in ongoing in this region and the extracted natural gas is supplied to the industrial units established in the district.

The gas extracted from the ONGC wells located in the Gandhar region provides feedstock to petrochemical complex which was initially developed by Indian Petrochemical Corporation Limited (IPCL), and later taken over by Reliance Industries Limited (RIL).

By 2003, the availability of natural gas was strengthened with the establishment of LNG Re-Gasification Terminal at Dahej by Petronet LNG Limited. The study region is also connected with national as well as state gas grid, thereby opening up all the major sourcing options for the usage of natural gas in the region. The national level natural gas trunk lines passing through the study region are listed in the Table 3.22 as under:

Table 3.22: Major Natural Gas Trunk Lines passing through GPCPSIR

Pipeline	Operator	Capacity (MMSCMD)	Supply Options
Dahej-Vijaipur Pipeline	GAIL	NA	Dahej LNG Terminal
Dahej-Uran Pipeline	GAIL	NA	Dahej LNG Terminal Hazira LNG Terminal
East-West Pipeline	RGTIL	120.00	KG Basin

Source: IMM Analysis

GSPL's proposed gas grid runs across the state and is interconnected with other national level gas grid at various locations i.e., Dahej LNG Complex – GACL section and GACL – Amboli Section. These grid sections run across the proposed GPCPSIR to supply natural gas to its existing industries and further interconnect various transmission lines to transport R-LNG from Dahej LNG terminal to other industries established across the state.

Figure 3.16: GAIL Pumping station



Source: MM photographs

Figure 3.17: DVPL-1 Gas pipeline under construction



Source: MM Photographs

Apart from the existing Oil and Gas infrastructure, certain part of the GPCPSIR area is included in the New Exploration License Policy (NELP) blocks. The global tendering process is ongoing for the same. The existing gas pipeline network and the NELP blocks area in the GPCPSIR area is shown in the Drawing No. 245268/EI/007(A&B) in Appendix E.7.

3.7.7 Truck Parking Bay / Container Yard

Presently there is no common Truck Parking Bay / Container Yard in the site. Only RIL has well managed Truck Plaza outside their plant premises to manage overall material movement through road. Almost 64% industries have truck parking bay outside their premises.

3.7.8 Existing Information & Telecommunication (ITC) Infrastructure

Telecommunication network is available mainly from Bharat Sanchar Nigam Limited (BSNL) and also from private distributors like Airtel, Vodafone and Idea. BSNL has provided an Optical Fibre Cable (OFC) network with ring connectivity. Within the proposed GPCPSIR, BSNL has exchanges at Dahej (1,500 lines), at Vagra (1,088 lines) and at Vorasamni (496 lines). At Vilayat, land has already been made available to BSNL for developing a telecom exchange. There are sufficient spare connections available in the region. ISDN facility is available at Dahej Exchange and internet (dial-up) facility is available from all telecom exchanges. BSNL provided existing and planned network map of Bharuch Telecom District which was super imposed on the base map of the proposed GPCPSIR. Map Analysis clearly reflects that Broadband (Tier II) has been planned at Dahej in the region and Broadband (DSLAM) has been planned for Dahej, Janiadara, Ambheta, Bhensali, Lakhigam, Rahiad and Birla Copper. WLL-BTS is available at Dahej and Vagra in the region. GSM-BTS is available at Bhensali, Dahej, Lakhigam and Vagra and is planned at Ambheta and Vadadla in the proposed GPCPSIR.

Tata Teleservices has laid down optical fibre network in the Dahej region. The telecommunication services provided by private telecom players are more satisfactory as compared to those provided by the PSUs. Few industries like Petronet LNG and RIL have also invested in strengthening overall ICT infrastructure to support their operations. Industrial Survey reveals that 86% industries have proper ICT infrastructure. The details of the existing telecommunication network is shown in the Drawing no 245268/EI/006 in Appendix E.6.

3.8 Social Infrastructure

This sector encompasses few basic services like education and health, drinking water facilities, housing, communication and transport facilities which improve quality of life of the villagers. The details included in Appendix F indicate the status of available amenities and facilities in the study villages of GPCPSIR. The following are few of the drawn inferences.

3.8.1 Education

Free and compulsory primary education for all children up to 14 of age is the objective of the Tenth Five Year Plan. This covers universal access to primary school within walkable distance. The referred table shows the following:

- 88% villages within the study area have primary schools and 13% villages have the facility of secondary school. Hence the non-school villages are using these village schools and thus student are travelling a distance to avail a basic facility.
- Few villages in Bharuch Taluka (Only 9% amongst 44 villages) villages have the facility of adult literacy Centre. This is also absent in Vagra Taluka.
- There is no senior secondary school, no college, no industrial school, and no training school within the site. To reach college a student has to travel more than 10km distance.
- Industrial Training Institutes are present at Bharuch town.

3.8.2 Health

- In Vagra Taluka, only Pipalia, Akhod, Jolva, Dahej, Lakhigam, Jageswar and Ambheta have allopathy hospital facility. Only 4.5% villages (Vorasamni and Sayakha) get the facility between 5km to 10km distance. 70% villages within the site get the facility of Allopathy Hospital after travelling more than 10km distance.
- No village within study area has Ayurvedic Hospital, Unani Hospital and Homeo Hospital.
- Residents of 9% villages within site (Pakhajan and Dahej at Vagra Taluka and Amleswar and Bhadbhut at Bharuch Taluka) have the facility of Allopathy Dispensary.
- Only 3 villages i.e. 6.8% (Vadadla, Dahej at Vagra and Navetha at Bharuch Taluka) have Maternity and Child Welfare (MCW) centre. Amongst the rest inhabitants of 25 villages (56%) need to travel more than 10km for MCW centre, 12 villages (27%) need to travel 5km to 10km and 4 villages (9%) got the facility within 5km distance.
- No village has maternity home.
- At Vagra Taluka in Lakhigam and Navetha at Bharuch has only the Child Welfare Centre for health facility
- Only Dahej (Vagra) and Navetha (Bharuch) has primary health centre. Residents of 54% (24 no.) villages have the facility more than 10km distance, 27% (12no.) Villages get it between 5km to 10km distance, and rest 13.6% (6no) get it within 5km distance.
- 27% villages (12no.) villages have the facility of Primary Health Sub Centre.
- Only 10 villages (22%) have the facility of Family Welfare centre.
- No village within Study Area has nursing home facility.
- Only 8 villages have registered medical practitioners.
- Beside this both Vagra and Bharuch Talukas have government owned hospitals at Taluka Headquarters of Vagra & Bharuch.
- Birla Copper has its own 10 bedded hospital in their township at Dahej

3.8.3 Communication Facilities

- Almost all the villages have the minimum communication facilities (i.e. landline phone), except Nadarkha, Sadathala, Vav, Luvara, Suva, Koliad at Vagra and Sankhwad at Bharuch. The above mentioned village do not have the communication facilities. These villages (16%) use the facility of Post Office within 5km distance.
- The inhabitants of Samatpor village have to travel more than 10km for post office.
- Vadva, Jolva and Bhensali have the post office facility between 5km to 10km distance.
- Only Pakhajan and Dahej have a telegraph office facility.
- Kaladara, Koliad, Suva, Vav used the phone facility travelling more than 10km distance, where as Nadarkha, Nandida, Galenda, Rahiad, Vengani have it within 5km reach.

3.8.4 Banks

- 9 villages (20%) have the commercial bank facility within 5km distance. 23 villages (52%) have the commercial bank facility between 5km to 10km distance. 8 villages (18%) have the commercial bank facility more than 10km distance.
- 8 villages (18%) have the Cooperative Bank facility within 5km distance. 12 villages (27%) have the Cooperative Bank facility between 5km to 10km distance. 22 villages (50%) have the Cooperative Bank facility more than 10km distance.

3.8.5 Public/Semi Public

Other social infrastructure such as healthcare, hotels, restaurant, schools, banks, public infrastructure is highly under-developed in the region.

3.8.6 Housing

The details of housing facilities as provided by industries for their employees are detailed in Table 3.23.

Table 3.23 : Details of Companies providing housing facility for employees

Name of the Company	Location of Housing Facility
Welspun Stahl Rohren Gujarat Limited	Bharuch
HINDALCO Limited – Unit: Birla Copper	Dahej
Reliance Industries Limited – DMD	Bharuch / Dahej
Gujarat Alkalies & Chemicals Limited	Bharuch
Pavit Ceramics Private Limited	Jolwa

Source: IMM Analysis

The housing facilities provided by the companies are mainly for employees and not for the workers. Workers generally live in nearby villages or towns of Ankleshwar and Bharuch.

3.9 Industrial Profile

3.9.1 Existing Industrial Estates

GIDC is pro-actively involved in developing industrial estates. Dahej 1 including Dahej SEZ and Vilayet are the already developed and allotted to industries in GPCPSIR. Few of the industries have already started working these estates as indicated in Table 3.24.

3.9.1.1 Dahej 1 including Dahej SEZ

Dahej1 has been developed by GIDC and it is a fully functional industrial estate within the site. The estate stretches over an area of 4000 hectare and houses some large industrial units. The internal infrastructure such as concrete roads, drainage network, telecommunication network, water supply network, etc has been developed in the estate to a large extent.

Dahej SEZ, India's fourth largest notified multi product SEZ is a part of Dahej 1 industrial estate and is being promoted through a special purpose vehicle under joint venture of GIDC and ONGC is also located within Dahej Estate. The SEZ which is primarily multi-product in nature spans an area of 1718.93 hectares. Few industries have started production in SEZ also and there are numerous industries which are under construction.

Figure 3.18: Dahej SEZ



Source: MM Industrial Survey 2009

3.9.1.2 Vilayet Estate

GIDC is developing an industrial estate at Vilayet. Major corporate houses such as Jubilant, Grasim, Assam Company and Biotor have acquired land for setting up industries or SEZs in the estate.

3.9.1.3 Expansion of estates

GIDC is in the process of acquiring land as illustrated in the following table to further facilitate industrial growth in the region. These areas are Dahej III, Dahej IV, Vilayet Expansion I and Vilayet Expansion II.

Table 3.24: List of Industrial Estates at GPCPSIR

Estate	Industrial (Ha)	Land acquisition status	Villages notified for the estate
Dahej including Dahej SEZ	4000	Acquired, developed and allotted	Dahej, Ambheta, Luvara, Suva, Lakhigam and Jageswar
Dahej 2	4220	90% private land (3798ha) has been acquired, developed and allotted	Rahiyad, Dahej, Suva, Jolva, Galenda, Vadadla
Dahej 3	1943	Only primary notification has been done (land use frozen)	Vav, Sambheti, Samatpor, Kadodara (amongst these Kadodara is out of our site area)
Dahej 4	5869	Only submitted land acquisition proposals	Akhod, Nandida, Atali, Bhensali, Koliad, Vengani, and Kaladara
Vilayet	1100	Acquired, developed and allotted	Bhersam, Aragama and Vilayet
Vilayet Expansion 1	1161	Section 4 of Land Acquisition Act 1984 has been issued	Aragama, Juned, Vorasamni and Ankot - Amongst these, Juniad and Ankot are beyond our site area
Vilayet Expansion 2	2334	Only submitted land acquisition proposals	Sayakha and Bhersam
Total	20627		

Source : GIDC

The detailed list of allotted industries provided Appendix G.

Beside these, three SEZs are being developed within GPCPSIR by the private developers. These are **Gujarat Hydrocarbon and Energy SEZ, Jayant Oil and Derivatives SEZ and Jubilant Organosys SEZ**

3.9.1.4 Anchor Tenant - ONGC Petro Additions Limited (OPaL)

The Gujarat Government has identified ONGC Petro additions Limited (OPaL) as anchor tenant for GPCPSIR. OPaL is a Joint Venture Company promoted by Oil and Natural Gas Corporation Ltd. (ONGC), Gas Authority of India Limited (GAIL) and Gujarat State Petroleum Corporation (GSPC). ONGC holds 26% equity, GAIL 19% and GSPC 5%. The remaining equity is shared between strategic investors, financial institutions and public. OPaL is setting up a dual-feed cracker at an investment of INR 12,440 Crores. The construction of this project commenced in December 2007. They are also setting up C₂-C₃-C₄ Extraction Plant at Dahej at an investment of INR 3,400 Crores. A petrochemical SEZ has also been planned in GPCPSIR called Dahej SEZ Limited, a joint venture company of ONGC and GIDC. Infrastructure for the Petrochemical Complex of OPaL will be provided by Dahej SEZ.

The cracker plant with a capacity of 1100 KTPA produces maximum polymer grade Ethylene and Propylene as petrochemical feedstock to downstream basic polymer units of Linear Low Density Polyethylene (LLDPE) High Density Polyethylene (HDPE), Polypropylene (PP) and Styrene Butadiene Rubber (SBR). LNG will be shipped to the terminal

Project Status – Key features:

- 507 hectare land acquired from Dahej SEZ.
- Environment and statutory clearances obtained.
- Site Infrastructure development tender awarded to M/s IVRCL, India.
- Dual Feed Cracker Job awarded to M/s Linde and M/s Samsung.
- Product selection technology under progress. Imported technology will be used for the plant and process.
- Site work under progress, infrastructure work 70% completed.

Source: Meeting with OPaL officials

Figure 3.19: OPaL construction site at Dahej



from Qatar. The product range of OPaL has been presented in Table 3.25

Discussions with OPaL officials reveal their enthusiasm for the project but at the same time concerns about the progress of infrastructure works by GIDC emerges as an issue for them.

Table 3.25: Product range of OPaL

Type of Product (name of the products)	Major Feedstock / Raw material used	Source Internally / Externally (specify the state or country)
Upstream products	a) Aromatic Rich Naphtha (ARN)	a) ONGC Hazira Gas processing Complex (HGPC) and Uran plant
Ethylene – 1100 KTPA	b) Light Aromatic Naphtha (LAN)	
Downstream products	c) C ₂ -C ₃ -C ₄	b) C ₂ -C ₃ -C ₄ recovery plant
a) HDPE, } 2 x 360	d) C ₅ from HGPC	
b) LLDPE, } KTPA		
c) LDPE,		
d) PP – 340 KTPA		
e) Benzene – 135 KTPA		
f) Butadiene – 95KTPA		
g) Carbon Black Feedstock – 70KTPA		

Source: OPaL Brochures, Discussions with OPaL officials

The Anchor Unit, OPaL, has plans to operate a dual feed cracker, obtaining Naphtha from its own operating plants at Hazira (pipeline transportation) and Uran (to be transported by sea to Dahej Port). Opal will source 9, 73,000 MTPA feedstock (C₂, C₃, and C₄) from the Petronet LNG (via its extraction unit) and 1.5 MMTPA naphtha from its Hazira and Uran units. Feed LNG will be supplied by PLL (Petronet LNG Ltd., JV of ONGC) and after extracting of C₂, C₃ & C₄, lean LNG will be sent back to PLL. OPaL through its C₂-C₃-C₄ recovery plant is providing the opportunities to invite the downstream units (plastic converters) to come to GPCPSIR and set up their manufacturing units. Opal will supply feedstock for these industries assuring long term supplies with global quality standards at competitive prices. Further the table 3.26 indicates the proposed small and medium industrial units along with investment in sub districts of Vagra and Bharuch.

Table 3.26: Proposed Industrial Units

Taluka	No. of units	Investment INR in Crore	Employment
Vagra	48	27737	29118
Bharuch	47	22399	15424

Source: DIC, Bharuch

3.9.1.5 Proposed Industries

The state marketed GPCPSIR during Vibrant Gujarat Investor Summit – 2009, 273 MOU has been signed with the investment of INR 74,003 crore and proposed employment of 1,00,002. 69 no. of MoUs was signed only for GPCPSIR. Table below gives the details on the proposed investment and employment based on the vibrant Gujarat summit 2009 MoUs data.

Table 3.27: Proposed Industries- Vibrant Gujarat Summit 2009

Parameters	Units (no.)	Proposed investment (INR.)	Employment (No.)
MSME DIC	27	73.47	1578
MSME GIDC	114	250.53	2072
Medium and Large Industries	132	73678.62	96352
Total	273	74002.62	100002

Source: indexB

4. Base Map

The Base Map is the foundation of any Draft Development Plan. The precision level of the Base Map is critical and has been achieved through several steps. This chapter elaborates the methodology adopted for preparation of the Base Map for GPCPSIR.

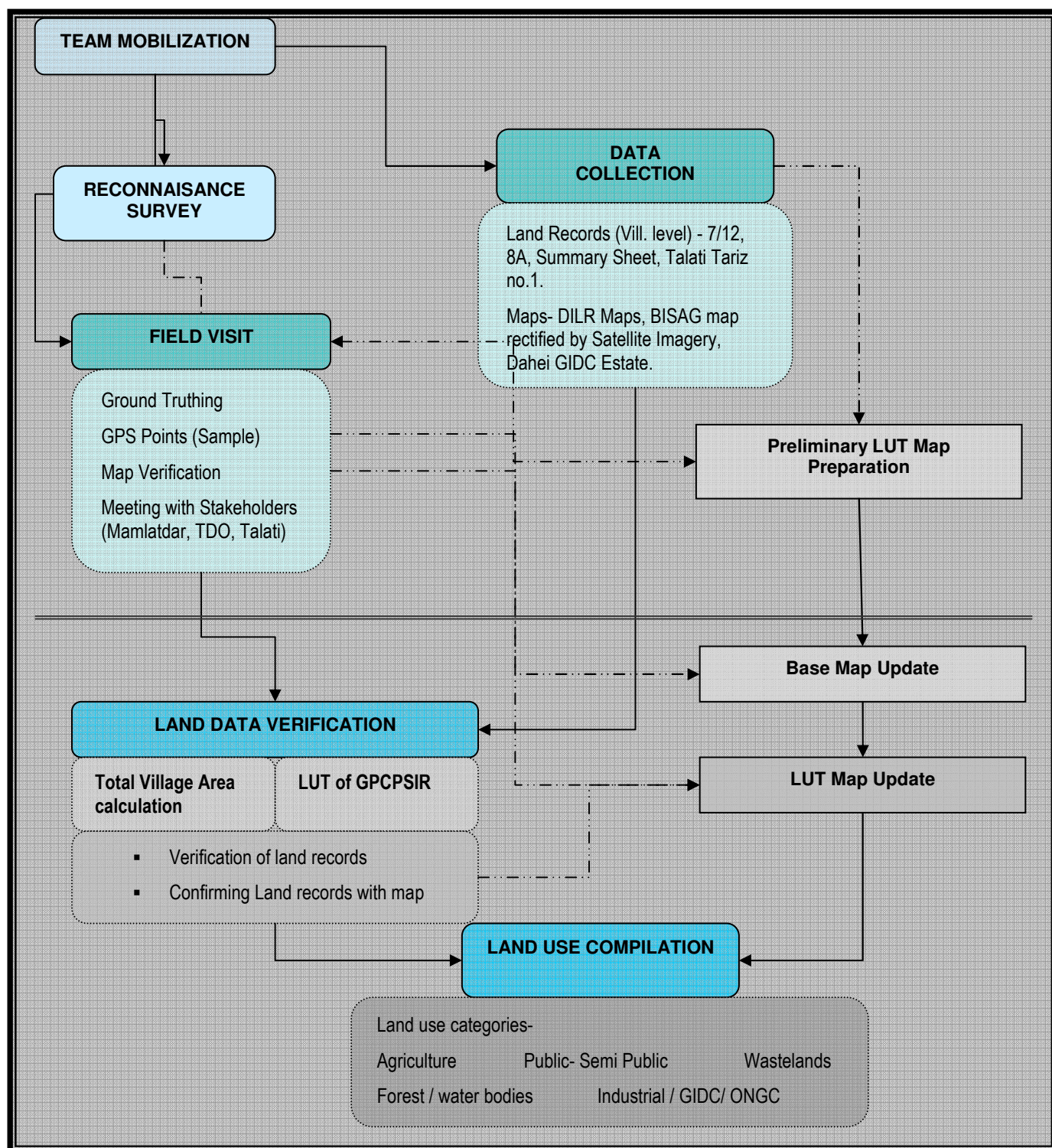
4.1 Notified area and Base Map

The notification issued by the Industries and Mines Department Gandhinagar on 9th June 2009 and published in the Government of Gujarat Gazette states that the GPCPSIR is proposed to be spread over an area of 45,298.59 Ha.

The draft base map of the existing site for GPCPSIR was provided by Bhaskaracharya Institute for Space Application and Geo-Informatics (BISAG) which has been interpreted from IRS data, 2005-06 and 2007. This map also indicated the high tide line, low tide line and location of reserved forest within the site.

The methodology of further preparation of the Final Base Map or Land use Map is given in the following section. Also the methodology of preparation of the Land use Map has been presented graphically in Figure 4.1.

Figure 4.1: Base map verification Methodology



4.2 Preparation of Base Map/ELU Map

4.2.1 Data collection

Mott MacDonald team visited offices at State, District, *Taluka* and village level to collect the land records and secondary information related to GPCPSIR area. The details of the same are elaborated in sections below.

4.2.1.1 Land records

Land records were collected from various sources as listed in Table 4.1. The purpose of this exercise was to obtain the survey number wise area details.

Table 4.1: Sources of Land Records

Land Records	Sources
7/12	Mamlatdar Office
8A	Mamlatdar Office
Summary Sheet (SS)	Mamlatdar Office
Tariz no.1	Talati, Village level
Tariz	DILR

Source: Secondary Data Collection exercise

4.2.1.2 Maps

Maps for each village were collected for verification of area, boundary and survey numbers from the DILR. Dahej GIDC estate map, provided by GIDC provided details of the estate layout and infrastructure network.

4.2.2 Preparation of Preliminary Land use Map

The preliminary Existing Landuse Map (ELU) was prepared by Mott MacDonald on the draft base map received from BISAG using information collected from the various Government departments indicated above.

4.2.3 Ground Truthing Exercise

The village wise preliminary ELU maps were taken to the site for verification. Our team of urban planners and researchers have done a rigorous and diligent village-wise land use verification exercise for the GPCPSIR area. Following were the main purposes of the primary survey conducted:

- Village area verification with *Talathi*
- Survey number verification with *Talathi*
- Ground truthing of various land uses including NA conversions
- Issues of water logging and other concerns

The correction process and the land records are attached in the Appendix B. Detailed discussions were also held during this stage with the *Mamlatdar* and *Taluka* Development Officer. 100 Global Positioning System (GPS) points were also observed for verification purpose. The objective of GPS survey was:

- To verify the Geo-referred map from BISAG

- To assist locate new developments which were absent earlier

The above exercise enabled the updating of the preliminary ELU. Several critical information missing in the draft base map as provided by BISAG were updated through secondary data collection and primary survey, some of which have been listed below;

- Jetties from the Google image
- Survey number wise location of Forest as per the data received from Forest Department
- The southern boundary of GPCPSIR along Narmada River was corrected on the basis of ground truthing exercise and village maps from DILR.

4.2.4 Cross References

Extensive data collection was carried out to find out the extent of the existing infrastructure from various Government agencies as well as individual industries. The details collected have been superimposed on the ELU map to the extent possible.

To assess the existing road network in the site, the district road network map was collected from Road & Building (R&B) Department and *Taluka* road network maps were collected from Vagra and Bharuch *Taluka* Panchayat office. Along with road network map, information like total road length of State Highways (SH), Major District Roads (MDR), Other District Roads (ODR) and village roads were collected from R & B Department and *Zila* Panchayat Office Bharuch.

The map showing detail of the water supply distribution network was collected from GWSSB, which shows the details of water supply from GWSSB, GIDC, ONGC and IPCL. The detail of the existing effluent line route was collected from GIDC and superimposed on the base map. Map showing details of the existing and proposed irrigation network were collected from Sardar Sarovar Narmada Nigam Ltd. GETCO had provided power network map of the Bharuch District which was again super imposed on the base map.

These maps were overlaid with minor adjustments to create the EUT Map/Base Map which has been attached at Appendix D for reference.

4.2.5 Corrective Measures

It was also observed that there are discrepancies in the village areas as published in the Government Gazette and the data mentioned in District Inspector of Land Records (DILR) office records. The details of the same are tabulated below in Table 4.2

Table 4.2: Verified GPCPSIR area

S. No	Village Name	Extent	Jurisdiction	Area (In Ha) as published in Gazette	Verified Area (in Ha) as per DILR/DILR Map	Source
1.	Aragama	Partly	GIDC	230.74	179.21	DILR Map
2.	Vorasamni	Partly	GIDC	233.45	190.49	DILR Map
3.	Vilayat	Completely	Vilayat Gram Panchayat & GIDC	1674.56	1674.56	DILR
4.	Bhersam	Completely	Bhersam Gram Panchayat & GIDC	1435.1	1435.06	DILR

S. No	Village Name	Extent	Jurisdiction	Area (In Ha) as published in Gazette	Verified Area (in Ha) as per DILR/DILR Map	Source
5.	Sayakha	Completely	Sayakha Gram Panchayat	1567.71	1567.71	DILR
6.	Kothia	Completely	Kothia Gram Panchayat	606.26	606.26	DILR
7.	Vahiyal	Partly	Vahiyal Gram Panchayat	1778.26	1804.90	DILR Map
8.	Pipalia	Partly	Pipalia Gram Panchayat	424.61	448.10	DILR Map
9.	Pakhajan	Partly	Pakhajan Gram Panchayat	1038.66	1282.54	DILR Map
10.	Nadarkha	Partly	Nadarkha Gram Panchayat	306.42	333.80	DILR Map
11.	Sambheti	Partly	Sambheti Gram Panchayat	226.58	323.92	DILR Map
12.	Janiadara	Partly	Janiadara Gram Panchayat	311.79	444.95	DILR Map
13.	Akhod	Completely	Akhod Gram Panchayat	562.27	862.55	DILR
14.	Nandida	Completely	Nandida Gram Panchayat	1222.8	1222.80	DILR
15.	Sadathala	Completely	Sadathala Gram Panchayat	449.76	449.72	DILR
16.	Khojbal	Completely	Khojbal Gram Panchayat	1222.53	1222.53	DILR
17.	Bhensali	Completely	Bhensali Gram Panchayat	563.47	563.47	DILR
18.	Atali	Completely	GIDC and Atali Gram Panchayat	1082.73	1082.73	DILR
19.	Galenda	Completely	Galenda Gram Panchayat	579.18	579.18	DILR
20.	Samatpor	Completely	Samatpor Gram Panchayat	293.05	293.06	DILR
21.	Vav	Partly	Vav Gram Panchayat	321.34	480.39	DILR Map
22.	Jolva	Completely	Jolva Gram Panchayat	874.81	874.81	DILR
23.	Vadadla	Completely	GIDC and Vadadla Gram Panchayat	685.87	685.87	DILR
24.	Dahej	Completely	GIDC and Dahej Gram Panchayat	3670.1	1801.31	DILR Map
25.	Lakhigam	Completely	GIDC and Lakhigam Gram Panchayat	1061.73	1061.73	DILR
26.	Luvara	Completely	GIDC and Luvara Gram Panchayat	895.81	895.15	DILR
27.	Jageshwar	Completely	GIDC and Jageshwar Gram Panchayat	1272.32	515.04	DILR
28.	Ambheta	Completely	GIDC and Ambheta Gram Panchayat	3745.21	1516.08	DILR
29.	Suva	Completely	GIDC and Suva Gram Panchayat	1431.58	1431.58	DILR
30.	Rahiad	Completely	Rahiad Gram Panchayat	1441.92	1441.92	DILR
31.	Koliad	Completely	Koliad Gram Panchayat	3727.68	974.15	DILR
32.	Vengani	Completely	Vengani Gram Panchayat	441.87	607.94	DILR
33.	Kaladara	Completely	Kaladara Gram Panchayat	1739.03	1755.92	DILR
34.	Amleshwar	Partly	Amleshwar Gram Panchayat	1971.14	1957.43	DILR Map
35.	Bhuva	Completely	Bhuva Gram Panchayat	348.42	348.47	DILR
36.	Eksal	Completely	Eksal Gram Panchayat	793.04	793.05	DILR

S. No	Village Name	Extent	Jurisdiction	Area (In Ha) as published in Gazette	Verified Area (in Ha) as per DILR/DILR Map	Source
37.	Kesrol	Completely	Kesrol Gram Panchayat	581.11	789.06	DILR
38.	Navetha	Completely	Navetha Gram Panchayat	457.97	457.99	DILR
39.	Manad	Completely	Manad Gram Panchayat	1061.87	1061.89	DILR
40.	Mahegam	Completely	Mahegam Gram Panchayat	560.82	560.85	DILR
41.	Bhadbhut	Completely	Bhadbhut Gram Panchayat	909.37	909.57	DILR
42.	Kasva-Samni	Completely	Kasva- Samni Gram Panchayat	613.74	842.72	DILR
43.	Vadva	Completely	Vadva Gram Panchayat	380.9	380.92	DILR
44.	Sankhwad	Completely	Sankhwad Gram Panchayat	501.01	501.06	DILR
Total				45298.59	39212.44	

GPCPSIR area verification exercise and the revision in the area were recorded in Interim Report 1 submitted to the Client in April 2010. Further to that our team had discussion with the Client in order to finalise the area to be considered for GPCPSIR. Table 4.3 presents the final description of the site area.

The Client has further sent the land details to GIDC District Collector, Bharuch office for confirmation. The same has also been discussed in details in a meeting between Collector Bharuch, consultant team, representatives from DILR and GIDC. The confirmed area is awaited to be received from the Collector office.

Table 4.3: Proposed GPCPSIR Village wise Land area

S.No.	Taluka Name	Village Name	Extent within GPCPSIR	Area in Ha	Source for Total Area
1.	Vagra	Aragama	Partly	351.49	DILR Map
2.	Vagra	Vorasamni	Completely	550.59	DILR
3.	Vagra	Vilayat	Completely	1674.56	DILR
4.	Vagra	Bhersam	Completely	1435.06	DILR
5.	Vagra	Sayakha	Completely	1567.71	DILR
6.	Vagra	Kothia	Completely	606.26	DILR
7.	Vagra	Vahiyal	Partly	1804.89	DILR Map
8.	Vagra	Pipalia	Partly	448.09	DILR Map
9.	Vagra	Pakhajan	Partly	1282.53	DILR Map
10.	Vagra	Nadarkha	Partly	333.80	DILR Map
11.	Vagra	Sambheti	Partly	323.91	DILR Map
12.	Vagra	Janiadara	Partly	444.95	DILR Map
13.	Vagra	Akhod	Completely	862.56	DILR
14.	Vagra	Nandida	Completely	1222.8	DILR
15.	Vagra	Sadathala	Completely	449.72	DILR
16.	Vagra	Khojbal	Completely	1222.53	DILR
17.	Vagra	Bhensali	Completely	563.47	DILR
18.	Vagra	Atali	Completely	1082.73	DILR
19.	Vagra	Galenda	Completely	579.18	DILR

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S.No.	Taluka Name	Village Name	Extent within GPCPSIR	Area in Ha	Source for Total Area
20.	Vagra	Samatpor	Completely	293.06	DILR
21.	Vagra	Vav	Partly	480.38	DILR Map
22.	Vagra	Jolva	Completely	874.81	DILR
23.	Vagra	Vadadla	Completely	685.87	DILR
24.	Vagra	Dahej	Partly	7107.00	DILR Map
25.	Vagra	Lakhigam	Completely	1061.73	DILR
26.	Vagra	Luvara	Completely	895.15	DILR
27.	Vagra	Jageshwar	Completely	515.03	DILR
28.	Vagra	Ambheta	Completely	1516.08	DILR
29.	Vagra	Suva	Completely	1431.58	DILR
30.	Vagra	Rahiad	Completely	1441.92	DILR
31.	Vagra	Koliad	Completely	974.154	DILR
32.	Vagra	Vengani	Completely	607.95	DILR
33.	Vagra	Kaladara	Completely	1755.92	DILR
34.	Bharuch	Amlleshwar	Completely	2205.51	DILR
35.	Bharuch	Bhuva	Completely	348.47	DILR
36.	Bharuch	Eksal	Completely	793.05	DILR
37.	Bharuch	Kesrol	Completely	789.07	DILR
38.	Bharuch	Navetha	Completely	457.99	DILR
39.	Bharuch	Manad	Completely	1061.89	DILR
40.	Bharuch	Mahegam	Completely	560.85	DILR
41.	Bharuch	Bhadbhut	Completely	909.57	DILR
42.	Bharuch	Kasva- Samni	Completely	842.72	DILR
43.	Bharuch	Vadva	Completely	380.92	DILR
44.	Bharuch	Sankhwad	Completely	501.06	DILR
Total				45298.59	

5. Situation Analysis

The situation analysis exercise has been carried out as part of the preparation of the DDP. This has formed a basis for the preparation of the land use and infrastructure proposals for the GPCPSIR area. As part of the situation analysis, various stakeholder consultations, certain technical studies and land suitability analysis have been conducted which are elaborated in the sections below.

5.1 Technical Analysis

Two technical studies have been done for the DDP preparation exercise including the Flood Risk Assessment study and analysis, industrial sizing exercise. Both these studies have been elaborated below.

5.1.1 Flood Risk Assessment

As part of preparation of Draft Development plan for GPCPSIR, Flood Risk assessment (FRA) study has been carried out. Apart from the Pluvial flooding possibilities, water logging issues in the area bounded by Narmada River in the south and Gulf of Khambhat in west have been analyzed in particular. All types of flood risks have been estimated and suitable recommendations have been made for flood mitigation strategies.

Four types of natural flood have been estimated in the study:

- **Fluvial Flooding:** from rivers and streams, including that resulting from the restricted capacity and blockage of culverts conveying watercourses;
- **Coastal Flooding:** from high tides and/or storm surges;
- **Pluvial Flooding:** (known as 'urban' or surface water flooding) resulting from the sensitivity and limiting capacity of the existing or proposed surface water drainage network and combined drainage systems. (Pluvial flooding constitutes around 25% of flooding events.);
- **Groundwater Flooding:** Less likely, but more extreme, man-made situations can result in unexpected and catastrophic flooding. Indicative areas of concern include reservoirs and dams, flood defence failure and the inadequate capacity of culverts, particularly below embankments.

Representation of flooding is accomplished using two types of models: hydrologic and hydraulic.

5.1.1.1 Flow in Narmada River

Garudeshwar is located at about 40 Km u/s of project area and 10km d/s of Sardar Sarovar dam. There is a huge catchment area between Garudeshwar and the project area. The Karjan, a south bank tributary, joins the river in this reach. In absence of data, detailed analysis of the contribution of the intermediate catchment to the peak flood discharge can not be made at this stage. There is a hydrological observation station at Bharuch located right in the project area. Sardar Sarovar dam is operational for part storage and it is likely to be operational shortly to its full capacity. It will also impact flood discharge in the project area. These data can be collected and detailed studies can be carried out during preparation on Detailed Engineering for GPCPSIR area.

To incorporate the impact of Sardar Sarovar Dam and contribution of intermediate catchment between Garudeshwar and the project area, the peak flood discharge for different return periods has been enhanced by 10 percent. The flood discharge and corresponding water levels are given in Table 5.1 below.

Table 5.1: Estimate of Flood Discharge and water levels in Narmada River at GPCPSIR area

Return Period (Years)	Flood discharge (cumecs)	Approximate water level (m) estimated from rating curve developed
Minimum observed (1948)	26334	11.1
2	29404	11.3
10	53761	12.8
25	65972	13.4
50	74709	13.6
100	83087	13.8

5.1.1.2 Water tanks/ pond

About 56 major Ponds have been identified from satellite map with about 1 million sqm with a total storage capacity of about 3 mcm in these Ponds. There are much more tanks in the area, than identified from satellite map. These tanks would act as stabilizing areas for flood protection and these should be preserved as far as possible even after development, which shall normally reduce the impact of pluvial flooding.

5.1.1.3 Tidal Impacts

Based on data on observed tidal levels at Dahej for a period of three years (2007-2009), maximum monthly tidal levels along with day and time of occurrence are mentioned in the Table 5.2.

Table 5.2: Maximum Monthly Tidal levels (m)

Month	2007			2008			2009		
	Date	Time	W.L (m)	Date	Time	W.L (m)	Date	Time	W.L (m)
Jan	20	18:05	8.17	24	17:38	8.27	13	18:09	13.26
Feb	19	17:51	9.02	9	18:07	8.46	11	0:12	-0.21
Mar	21	18:19	9.95	11	19:14	9.5	11	4:34	9.42
Apr	19	17:58	10.29	8	18:10	10.03	25	16:43	9.55
May	17	16:54	10:32	7	17:52	10.29	25	17:51	10.13
June	15	16:40	10.09	4	16:05	10.32	25	18:26	10.19
July	31	17:23	9.7	4	17:28	10.18	24	17:24	10.31
Aug	29	16:55	9.76	1	16:30	9.09	21	17:03	10.09
Sep	30	6:27	10.05	19	6:37	9.55	21	5:48	9.81
Oct	27	4:41	10.2	17	5:35	10.03	19.	4:47	9.85
Nov	26	5:10	10.35	15	5:20	10.26	5.	17:37	7.88
Dec	25	5:02	10.08	14	5:11	10.25	4	5:22	9.99

It is observed that maximum tidal level of 13.26m is in January. During this part of the year, discharge in Narmada, Bhuki Khadi and other drains are low. The rivers are in spate in August/September. Highest tidal level during this period is 10.09m and water level for 100 year flood is 13.8m. In case both of these

synchronize, rough estimate of likely water level in the river is 14.1m. Detailed estimate has to be done during DPR stage after detailed survey with more additional data.

5.1.1.4 Flood Risk Assessment

The Preliminary FRA exercise has shown sequential extent of flood in 2yr, 10 yr and 100yr floods.

1. Fluvial flooding

Fluvial Floods in river Narmada indicated that about 57 to 74 sq.km of the area North of Narmada river would likely to be flooded for average flood of 9.6 lakh cusecs to about 30 lakh cusecs for 100 year to 200 year return period. The flood front may advance to about 1km north of the present flood area if no protection works are provided in the area.

2. Tidal Flooding

The effects of tidal waves have been included in the boundary conditions in the above flood analysis. For average flow conditions, the average high flood of 4.5 m included while, the highest of 9.8 m tidal level for the month of September is considered for the 100 yr and 200 year floods. High tide line is the extent of the tidal flood along the river in the south and sea from the west.

3. Pluvial Flooding

Overflow of bhukhi khadi and its local streams into the low lying areas is likely to bring pluvial flood. The flood effect is maximised from 2 yr to 10 yr daily rainfall flood. The highest 10 yr flood can be 24.36 MCM. The 100 yr peak daily rainfall is estimated to much severe, of more than 200mm depth. Refer table 5.3 below for details.

Table 5.3: Pluvial Flood discharge

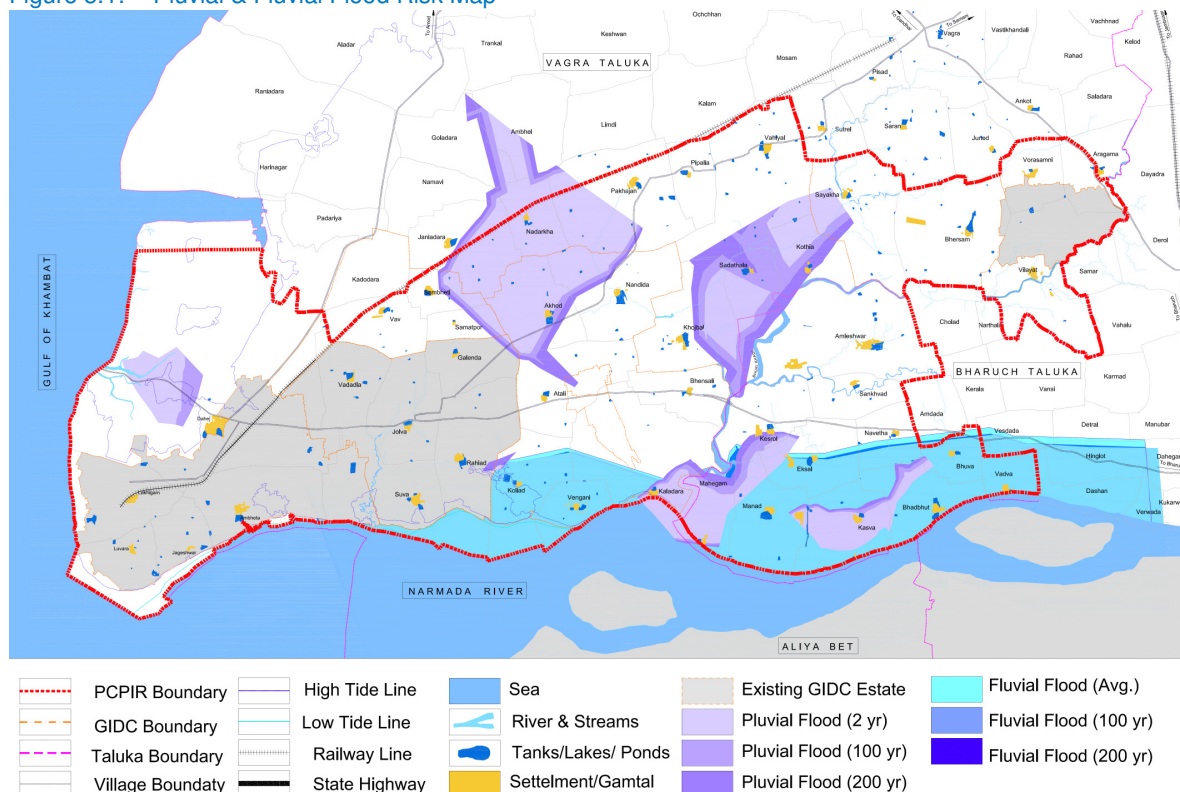
Pluvial Floods in the Study Area								
Sub Basin	A		B		C		D	
Return Period	2 -yr	10- yr	2 -yr	10- yr	2 -yr	10- yr	2 -yr	10- yr
Area (sq.Km)	35	35	217	217	119	119	82	82
Daily Rain Fall (mm)	51.2	119.38	51.2	119.38	51.2	119.38	51.2	119.38
Max Discharge (Cumec)	1307	7165	9287	60177	4039	36166	2591	16787

Source: Flood Risk Assessment study attached with the report

About 56 small and large ponds were identified with an area of about 1 million sqm area with approximately about 3 million cubic meters of storage capacity. Yet these waterholes are not sufficient to accumulate the access rainfall water.

Spatial variation and distribution of pluvial and fluvial flood has been shown in the Figure 5.1 below:

Figure 5.1: Pluvial & Fluvial Flood Risk Map

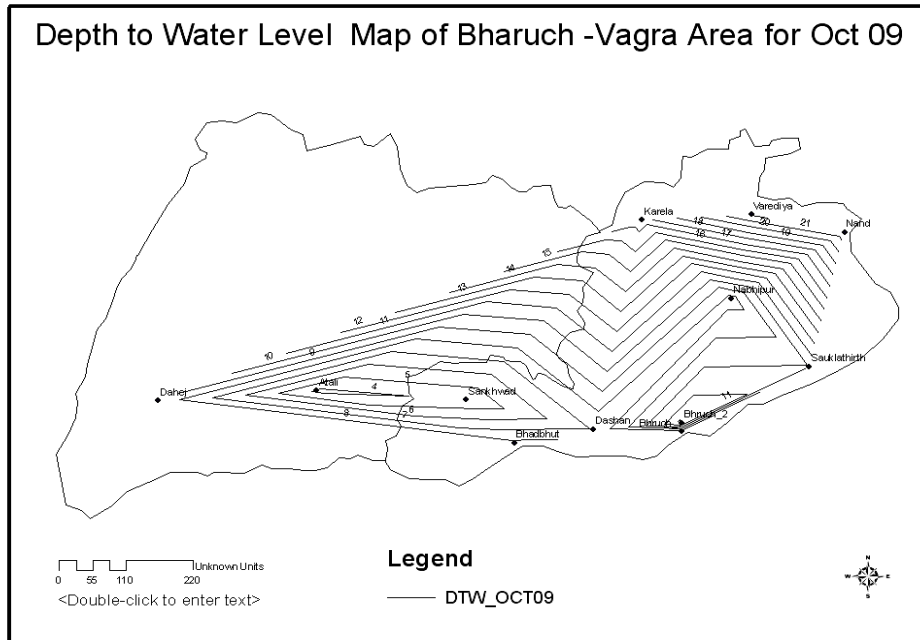


Source: Flood Risk Analysis

4. Ground water flooding

Depth to ground water level analysis has indicated that there is no danger of groundwater flooding as well as water logging conditions in the area. However, there is a threat of seawater intrusion and subsequent salinity intrusion in the area if groundwater pumping is allowed in the area. It is also observed that the “Zero” water table contour shifts towards the sea in monsoon period indicating that the artificial recharge methods would work in these area. The depth to ground water level map is given in Figure 5.2

Figure 5.2: Ground water depth



Source: Flood Risk Analysis

5.1.1.5 Ground truthing

Flood risk assessment study has been verified on the site by crosschecking the extent, frequency and causes of flood with the locals. Refer figures below for reference. The field observations brought forth the flaws of drainage pattern resulting into backwash of bhukhi khadi and quick flooding of low lying areas in a single shower. Ground truthing exercise provided insights on the adverse impact on rural life and agricultural economy.

Figure 5.3: Ground truthing for flood history



Source: MM

Figure 5.4: Water logging condition in farms at the site



Source: MM

5.1.2 Industrial Sizing

The industrial sizing for GPCPSIR area has been done with the help of various studies, stakeholder consultation, primary survey and analysis of parallel examples. This has provided a broad, contemporary as well as practical base for the industrial sizing that has been used as a basis for the projections and proposal for the GPCPSIR DDP. The sizing activity has been detailed below and includes four aspects viz. Existing industrial survey and infrastructure assessment, Brief studies of other Indian and International PCP estates and study of chemical sub-sectors including the sectors in the MoUs signed with the Government of Gujarat by various Industries during Vibrant Gujarat Summit.

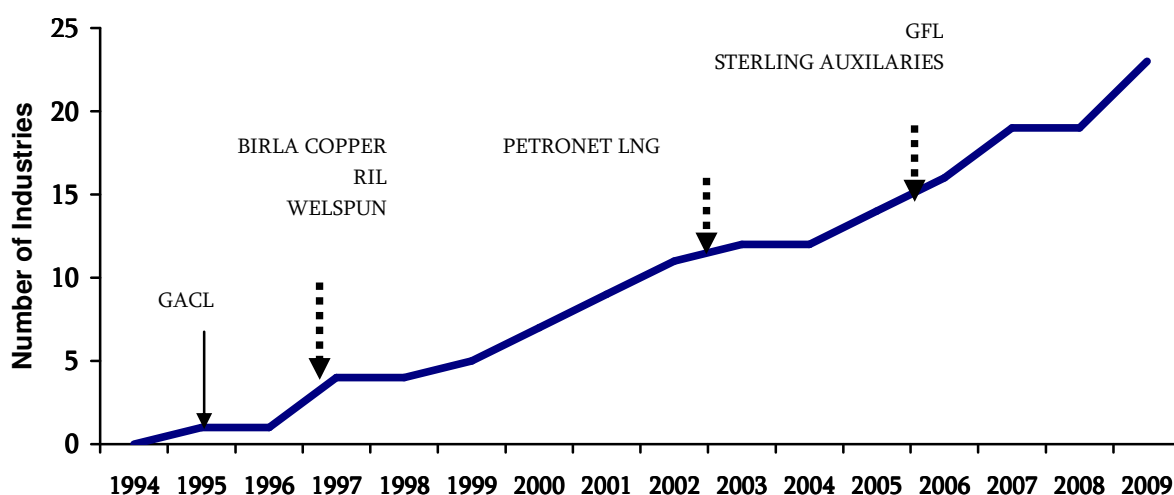
5.1.2.1 Existing Industrial Survey and infrastructure assessment

Mott MacDonald study team conducted a primary survey of the Industries existing in GPCPSIR area in the month of November & December, 2009. It was observed that there were 29 operational industrial units in GPCPSIR. Industrial activity took the first step in the year 1995 with the establishment of a chlor-alkali complex by Gujarat Alkalies & Chemicals Limited (GACL) and thereafter the region has never looked back in terms of industrial development. The historic perspective in the overall development of industries within the site is illustrated in Figure 5.5.

The industrialization was slow in the initial years but after 2000 it gained strong momentum. The industrial establishment is likely to accelerate at much higher rate in the years to come with large number of projects in pipeline. Apart from industrial activities, ONGC is carrying out full fledged exploration and production activities in the region as well as supply of natural gas to industries in the district.

The distribution of present industries in the region shows the dominance of Chemical and Petrochemical sector with a share of 48% in terms of units and 74% in terms of area covered. Ceramics and Engineering are the other important industrial segments in the region.

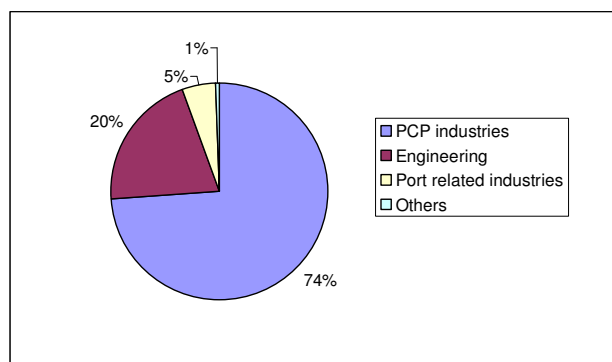
Figure 5.5: Historic Trend in Industrial developments – GPCPSIR



Source: IMM Analysis

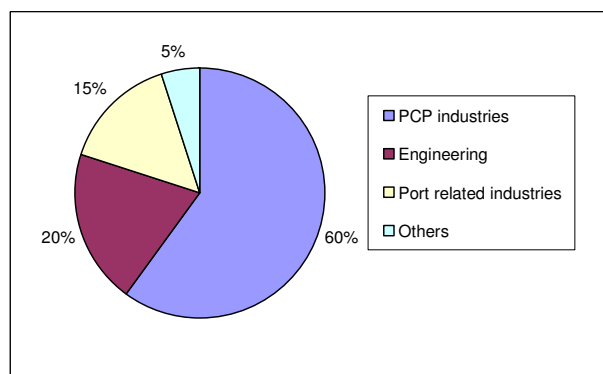
The overall structure of present industrial activities in the region is captured in the Figure 5.6 and Figure 5.7. Mott MacDonald study team has carried out a primary survey of 29 operational units within the site to gather information on production and employment.

Figure 5.6: Areawise sectoral distribution among industries



Source: Primary Industrial Survey 2009

Figure 5.7: Number wise sectoral distribution among industries



Source: Primary Industrial Survey 2009

Table 5.4: List of Surveyed Industries

S. No.	Name of Industry	Types of Products	Employment	Area (Ha)	Fixed Investment
1	BASF Styrenics Private Limited	Polystyrene – HIPS/GPPS	95	0.24	Last 3 capital investment was very low, totalling to maximum of 2 Crores INR
2	Gujarat Alkalies & Chemicals Limited	Chlor-alkali products	700	140.95	

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S. No.	Name of Industry	Types of Products	Employment	Area (Ha)	Fixed Investment
3	Meghmani Finechem Ltd.	Chlorine, Hydrogen, Dilute sulphuric acid, HCL, Sodium Hydrochloride	300	65	NA
4	Chlorides India	Calcium Chloride, Ammonium Chloride concentrate	16	0.223	NA
5	Sitaram Energy & Logistics Ltd.	packaging of DAP/NPK	25	1.523	NA
6	Standard Enterprise	Motor windings	18	0.239	NA
7	Hindalco Industries Limited	Copper anode, cathode, sulphuric acid, Phosphoric acid, DAP, NPK,	2500	356.35	NA
8	Organic Industries Limited	KMnO ₄ , Boric Acid powder	135	17.15	200 Crores
9	Petronet LNG Limited	Natural Gas	180	50001, 82.5	NA
10	Indofil Chemicals Company	Mangozeb	98	9.87	78 Crores
11	Luna Chemical Inds. P. Ltd.	Nitro Aromatics, Aniline Oil, Nitro Benzene	50	6.894	NA
12	ONGC – Gas Gathering Station	Others (Oil & gas gathering st.)	10	NA	NA
13	Shoft Shipyard Private Limited	Ship building	250	NA	5 crores
14	Pavit Ceramics Pvt. Ltd.	Ceramics tiles	60	NA	NA
15	Welspun Gujarat Stahl Rohren Ltd.	Longitudinal Saw Pipe, Spiral Saw Pipe, Fabricated Pipe	500	NA	NA
16	GCPTCL	Storage farm	90	NA	6crores
17	Grow More Enterprise / Narmada Enterprise / Jayson Enterprise (A Group of Kaneria Group of Industries)	Sodium Silicate, Ceramics Frit	25	NA	NA
18	Gujarat Fluoro Chemicals Limited	PTFE- PT-PTFE & TFE, Chloro Methane, Caustic Soda		NA	NA
19	ISGEC	High pressure vessels, Boiler, Heat Exchanger	300	NA	NA
20	Nahar Colours & Coating Ltd.	Ceramic Tiles	60	NA	NA
21	Sterling Auxiliaries Pvt. Ltd.	D/s Petrochemical product	98	11.19	NA
22	Kaneria Granito Limited	Vitrified tiles	350	NA	NA
23	Universal Chemicals & Industries Pvt. Ltd.	KMnO ₄ , KOH	150	9.35	100 crores
24	Jolly Abrasives	Process Copper Slag	15	2.191	12440 crores
25	Eurostar Crystal Marble	Artificial marble	30	NA	NA
26	Reliance Industries limited	Petrochemical	>500	681.61	400 crores approx

S. No.	Name of Industry	Types of Products	Employment	Area (Ha)	Fixed Investment
27	ABG Shipyard Ltd.	Shipbuilding	>500	17.99	NA
28	Daya Glass Industries Pvt. Ltd.	Glass Bottles	93	NA	NA
29	ONGC Petro additions Ltd. (OPaL)	Petrochemical	>500	507	NA

Source: Industrial Survey

The key observations from the primary survey conducted by Mott MacDonald Team has been elaborated below;

1. Raw materials and products

- Availability of Natural gas and setting up plants by OPaL has led proliferation of petrochemical products in the GPCPSIR (even though OPaL is not operational yet). This has also led to development chlor-alkali, soda ash and other ancillary plants.
- Wide-scale availability of salt in the region has resulted in the development of 5 Chlor-alkali manufacturing facilities opening huge avenues for integration of petrochemicals and chemicals segment. Chlor-alkali products like caustic soda, chlorine, hydrochloric acid, hydrogen and others cannot be hauled long distances hence manufacturing units of these products have been developed within close distances.
- GACL has entered into strategic joint venture with Dow chemicals to setup chloromethane production facility at Dahej
- Organic Industry would expand their capacity in the future with strategic technological partner.
- All the chemical and petrochemical units in the region rely primarily on imported technologies for manufacturing products. Any technological change in the plants would involve setting up of new imported technology.
- Availability of depth of water and surrounding port led development has also proliferated in development of Shipbuilding Industries.

Figure 5.8: Reliance Industries



Source: MM Industrial Survey 2009

2. Raw Material Transportation

It was found that the inputs and outputs of production of the industrial units in the site are moved through waterways, roads, rails, overhead transmission lines (power) and under ground pipelines. The following table shows that majority of the industries are dependent on road for its material movement, and then comes port and pipelines.

Table 5.5: Material Movement

Mode of transportation	Raw material Movement (%)	Material despatch (%)
Road	68.97	75.86

Mode of transportation	Raw material Movement (%)	Material despatch (%)
Port	31.03	34.48
Rail	6.90	6.90
Pipeline	24.14	24.14

Source: Primary Industrial Survey 2009

3. Employment

With the varying size of Industries, the employment is also varying amongst the existing operational industries. Single largest employer within the site is Hindalco (Birla Copper) having employment of 2500.

4. Fuel Consumption Details

The industries use all the major types of fuel for heating and power generation, the details of which are given in the Table 5.6. Natural gas and coal dominates overall energy profile of industries followed by diesel and furnace oil.

Table 5.6: Fuel Consumption of Industries

Type of Fuel	Quantity
Natural Gas	1.1 MMSCMD
Furnace Oil	25 KLPD
Coal	2400 MTPD
High Speed Diesel, Light Diesel Oil	50 KLPD

Source: Primary Industrial Survey 2009

The major fuel intensive industries are GACL, Gujarat Fluorochemicals Limited, Meghmani Finechem Limited, Birla Copper and Welspun Stahl Rohren Gujarat Limited.

5. Infrastructure Assessment

It is observed from the survey exercise that most of the industrial units are dependent on outside intervention in the matters of transportation of materials, power, water, parking space for vehicles and commutation of employees.

To carry out the exercise, first the operations of an individual unit have been divided into three phases, viz. Pre-production & production, Post production and Common services, so as to study the flow of production input & output materials and the requirement of physical infrastructure at each and every stages of operation. Based upon the data collected through the above Field Survey, a matrix was drawn to show the items of infrastructures, for which the units are dependent on outside intervention (Refer Appendix H Infrastructure Matrix of Industrial Survey)

The overall perception of industries with respect to infrastructure – industrial as well as social is “**Below Average**”. The major problems and issues raised by industries with respect to infrastructure are provided below:

- **Public Transportation facility** connecting Dahej with Bharuch & Ankleshwar is very poor. The employees and workers have to pre-dominantly depend on facilities provided by the company. Flexibility of public movement within the estate as well as outside estate during odd hours is very difficult not only for the employees but their family members as well.
- **Overall social infrastructure** in the region is highly under-developed. There are no proper education, healthcare, hotel & restaurant and recreational facility options for the people of the region and have to depend on facilities of Bharuch to a large extent.
- **Industries face power problems** with respect to unscheduled cuts which affects the productivity, especially in the continuous process plants. In order, to make up for the production loss, industries have to operate DG sets which eventually increases the overall production cost.
- **Industries face shortage of technical skilled manpower** primarily because of establishment of large number of competing industries in the region. The nearest industrial technical institute (ITI) is located at Ankleshwar & Bharuch and is anticipated that it would fail to meet the growing need of skilled manpower in the years to come
- **GIDC has not laid down complete water distribution system** even in the Dahej Estate and some industries procure water through tanker or via other industries. This increases delivered price of water by significant amount.
- The world-class **healthcare facility** in the region has not been developed and nearest such facility is located at Bharuch. Few industries such as RIL and Birla Copper have fully functional healthcare facility and other industries have developed occupational health share
- Although **overall road infrastructure** in the region is excellent, approach roads to some of the industries has not been developed. This problem is primarily faced by the industries which are not the part of GIDC developed estates/SEZs and are scattered across the region.

Figure 5.9: GACL



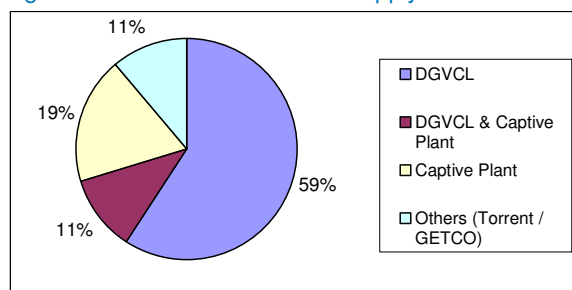
Source: Primary Industrial Survey 2009

Figure 5.10: LNG Petronet Jetty



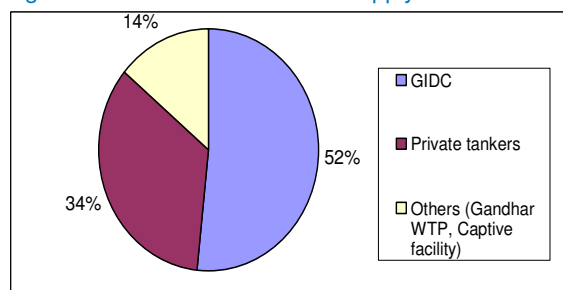
Source: Primary Industrial Survey 2009

Figure 5.11: Situation of Power supply situation



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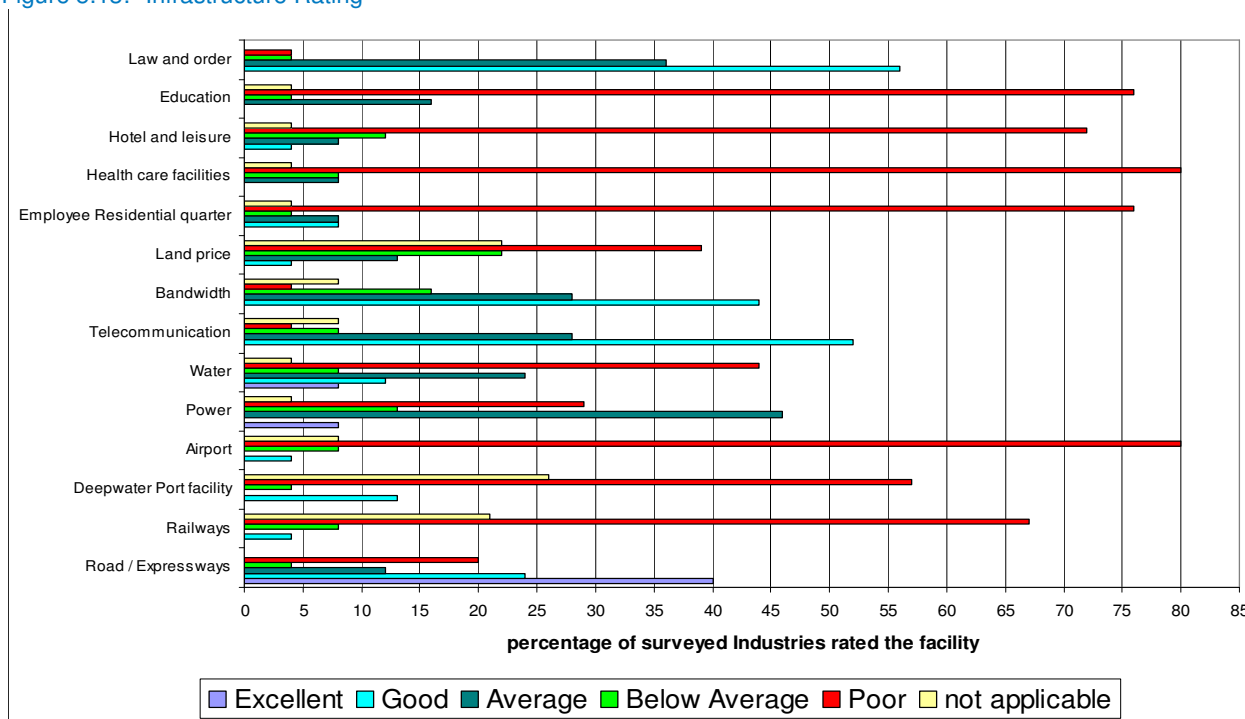
Figure 5.12: Situation of Water supply



Source: <Insert Source here>

- The nearest public fire station in the region is located at Bharuch which is nearly 60 KM from the Dahej estate. Although few industries have fire-fighting facility and fire-handling system, it is mainly restricted for the captive purpose. With the development of chemical and petrochemical industries, need for public fire fighting in the vicinity to clusters arises on the priority basis.
- The other issues which industries have to deal with are – illicit liquor problem, soil erosion on the banks and shores of the river bed, land encroachment and harassment from the local villagers.
- The deepwater port facility for handling solid cargo is presently not available and industries importing or exporting materials depends on either Mumbai port or Kandla port. However Adani & Petronet are jointly developing jetty for handling solid cargoes thereby giving providing momentum to overall industrialization in the region.
- The land prices have increased steeply over the near past in anticipation of growing need of land for the development of industries. Such sustainable rise in the prices could dampen overall rate of industrialization in the years to come. The infrastructure rating has been presented in Figure 5.13.

Figure 5.13: Infrastructure Rating



Source: IMM analysis

6. Expansion Plans of Industries

The expansion plans based on the feedback received from the existing players is provided in Table 5.7:

Table 5.7: Proposed Expansion details of existing industries

Name of the Unit	Expansion Product	Investment (INR. Lakh)
ISGEC	High pressure vessels / Boilers / Heat exchangers	10,000
Gujarat Fluoro Chemicals Limited	PTFE- PT-PTFE & TFE / Chloro Methane / Caustic Soda	30,000
GCPTCL	Two Storage Tanks	1, 200
Petronet LNG	Power Plant of 1200 MW	-
Organic Industries Limited	Potassium Permanganate / Boric Acid	20,000
Chlorides India	Phosphorous	-
GACL	Chloromethane	60,000

Source: Primary Industrial Survey 2009

Only few players have shown interest in expanding their production capacity, primarily because majority of the units in the region are newly established. Also in the light of global financial crisis and sluggish market conditions, many players have put their plans on hold and would wait for overall economic and market to recover before committing further investments.

7. Other Infrastructure

- Truck Parking Bay / Container Yard:** Presently there is no common Truck Parking Bay / Container Yard in the site. Only RIL has well managed Truck Plaza outside their plant premise to manage overall material movement through road. Almost 64% industries have truck parking bay outside their premises.
- ICT Infrastructure:** BSNL and all major private telecom players provide telecommunication services to the industries in the region. Tata Teleservices has laid down optical fibre network in the Dahej region. The telecommunication services provided by private telecom players are more satisfactory as compared to those provided by the PSUs. Few industries like Petronet LNG and RIL have also invested in strengthening overall ICT infrastructure to support their operations. Industrial Survey reveals that 86% industries have proper ICT infrastructure
- R&D Centre:** All the major industrial units have R&D centre with the intention to improve the quality of the products and develop new applications for their existing product. These R&D centre could be either within plant premise or located at other centralized locations in India. GPCPSIR existing Industrial Survey also reveals that almost 62% industries have the facility of R&D centre.
- Housing:** The details of housing facilities as provided by industries for their employees are detailed in Table 3.23 in Chapter 3.

Table 5.8 : Details of Companies providing housing facility for employees

Name of the Company	Location of Housing Facility
Welspun Stahl Rohren Gujarat Limited	Bharuch
HINDALCO Limited – Unit: Birla Copper	Dahej

Name of the Company	Location of Housing Facility
Reliance Industries Limited – DMD	Bharuch / Dahej
Gujarat Alkalies & Chemicals Limited	Bharuch
Pavit Ceramics Private Limited	Jolwa

Source: IMM Analysis

The housing facilities provided by the companies are mainly for employees and not for the workers. Workers generally live in nearby villages or towns of Ankleshwar and Bharuch.

5.1.2.2 Brief studies of other Indian and International PCP estates

1. Product and facilities selection

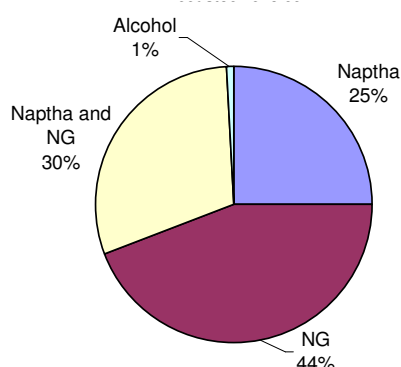
Indian and International PCP estates have been studied as listed in Table 5.9 for benchmarking various parameters like product mix, employment and facilities available.

Table 5.9: Benchmark Estates

International PCP Estates	National PCP Estates
Port of Rotterdam, Netherlands	RIL, Dahej / Gandhar, Gujarat
Port of Antwerp, Belgium	RIL Jamnagar, Gujarat
Jurong Islands, Singapore	RIL Hazira, Gujarat
Shanghai Chemical Industrial Park, China	RIL Vadodara, Gujarat
Nanjing Chemical Industrial Park, China	RIL Naroda, Gujarat
Bayport Chemical Estate, Houston, USA	RIL, Nagothane, Maharashtra

Brief information is summarized and presented in Volume I, Section 2- Surveys & Studies on the above mentioned components.

Figure 5.14: Feedstock choice



Source: Secondary research by MM

2. Feed stock selection

A wide range of alternative feed stocks such as naphtha, ethane/propane, alcohol, LPG, NGL and gas oil can be used for production of Petrochemicals. In India, naphtha and C2/C3 fractions from natural gas are the main feedstock used. LPG is normally used as domestic fuel, while gas oil is not used because it is heavier fraction and needs complex processing. In India, some refineries crack LPG in their fluidised catalytic cracking units to produce propylene. A summary of various feedstock used by Indian petrochemical majors is presented in Table 5.10.

Table 5.10: Feedstock used by Indian Petrochemical Majors

Complex	Ethylene Capacity (TPA)	Feed stocks
RIL, Vadodara	1,30,000	Naphtha
IPCL-MGCC, Nagothane	4,00,000	Gas (C2/C3 7:3), ethane-propane fraction
RIL, Gandhar	3,00,000	Gas (C2/C3 7:3), ethane-propane fraction
RIL, Hazira	7,50,000	Naphtha / Natural Gas Liquid
NOCIL, Thane	75,000	Naphtha
HPL, Haldia	4,20,000	Naphtha
GAIL, Auriya	4,00,000	Gas (C2/C3 9:1)
Oswal Agro, Mumbai	22,000	Alcohol

Source: Secondary research by MM

From Table 5.10 and Figure 5.14, it is apparent that about 44% of India's cracking capacity is based on natural gas, 25% is based on Naphtha feedstock and 30% is using Naphtha and NG both. Industrial alcohol which was an attractive feedstock in the days of alcohol price control is no longer an important feedstock and accounts for only 1% of the total ethylene production in the country. The major factors which affect the choice of feedstock are the relative yields of olefins and aromatics, desired energy costs, investment levels, availability and relative pricing. Natural gas and NGL yield a much higher proportion of ethylene. Hence, they are preferred when the polyolefins output of a cracker is sought to be maximised. On the other hand, naphtha is preferred when a wider range of output products (including propylene and butadiene derivatives) is desired.

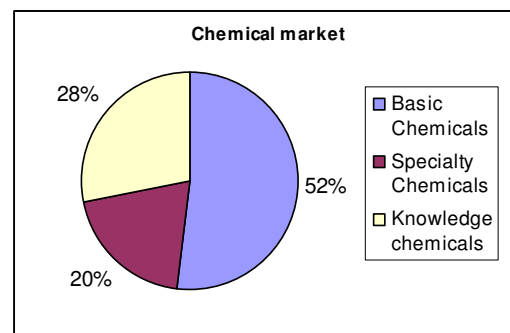
Study reveals that refineries in Gujarat produce a good quantity of Naphtha for meeting feedstock requirement of the petrochemical industry, which is expected to increase significantly with the commissioning of the proposed refinery of Essar (18MMTPA). The growing demand of petroleum and petrochemical products in the region would also influence the existing players to increase their refining capacity in the plant over the years. Availability of gas for use as petrochemical feedstock is limited as meeting demand from the fertilizer and power sectors are given priority.

Hence in GPCPSIR, for steady feedstock supply regional feedstock can be considered or it can also be obtained from outside which can be obtained through chemical terminal of GCTCPL.

5.1.2.3 Study of chemical sub-sectors

- The chemical industry is a key contributor to the world economy. The industry supplies to virtually all sectors of the economy and produces more than 80,000 products. The growth in revenues within the chemical industry depends largely on the overall growth of the economy and industrial production and is often measured as a multiple of GDP growth.
- Global chemical industry is classified into Basic Chemicals, Specialty Chemicals and Knowledge Chemicals.
- Considering three major factors i.e. global demand supply balance, presence of the chemical sub-sectors in the other Petrochemical Estates in India and abroad and industry opinion, it is clear that petrochemical building blocks and its derivatives has the best potential to anchor in the GPCPSIR.
- Further, the other factors such as investment potential, employment potential, export intensity etc also favours the petrochemical industry to be present in the PCP estates. The Table 5.11 clarifies on the product selection for GPCPSIR.

Figure 5.15: Chemical Market



Source: In-house database from Mott MacDonald

Regionally emphasized Industries

Key growth areas as identified by the Government of Gujarat (GoG) are as follows:

- Petrochemicals
- Refinery Downstream Projects
- Mineral Resource-based Projects
- Nanotechnology-based Projects
- Basic Chemicals
- Specialty Chemicals
- Knowledge chemicals
- High Performance chemicals
- Agrochemicals
- Engineering thermoplastics compound
- Large plastic crates / pallets
- PVC profiles for door and windows
- Plasticisers
- Pigments and coating products
- Bio Refineries

GoG has even identified the following Chemical and petrochemical projects where investors are invited:

- Methanol
- Propylene oxide and propylene glycol
- Cumene
- Phenol / Acetone
- Nitrobenzene and Aniline
- Diphenylmethane diisocyanate (MDI and toluene di-isocyanate (TDI)
- Polyvinyl Chloride

- ABS Resin
- Polycarbonate resin
- Polyethylene terephthalate (PET) chips
- Styrene butadiene Rubber (SBR)
- Bi-axially oriented polypropylene (BOPP) Films
- Polyethylene (PE) Multi layer film project
- Polyolefins compounding and masterbatches
- Polypropylene (PP) ropes
- Fibre and filament
- Plastic crates
- Bisphenol A
- Mono chloro Acetic Acid (MCA)
- Bromine
- Titanium Tetrachloride / Titanium Dioxide
- Chlorosilanes
- Synthetic Zeolite – Zeolite A
- Contract research and manufacturing services (CRAMS)

Considering the regional sectoral emphasis it is projected that a large number of chemical and petrochemical industries, plastic and elastomer processing industries, ancillary and service industries have a very good potential for being set up. Thus, the value chain has been derived keeping the above sectors in mind.

Table 5.11: Benchmarking of PCP Estates

Name of estates	Area (ha)	Employment		Refinery	Cracker plant	Product mix)								Commodities	Intermediates	Final products	Port	Pipeline	Airport	Facilities available			Third-party logistics park*
		Direct	Indirect			Ethylene	Propylene	Butadiene	Benzene	Toluene	Xylene	Storage / Warehouse	Container terminal										
Port of Rotterdam	5,000	12,000	60,000	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y		
Port of Antwerp	13,500	63,080	1,50,000	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	--	Y		--		
Bayport Chemical Estate Houston	3,000	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	--	--	--	Y	Y	--	2.2ha	18ha		--		
Jurong Island, Singapore	3,200	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	--	--	--	18million cubic metre			80ha		
Sanghai Chemical Industry Park (SCIP)	3,000	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-		--		
Nanjing Chemical Industry Park	5,000	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	--	Y	--	--	--	--	--	--		chemical exchange centre*		
RIL (IPCL), Dahej / Gandhar	700	1,600	NA	N	Y	Y	--	--	--	--	--	Y	--	--	Y	Y	N	Y	--		N		
RIL, Jamnagar	3,036	NA	NA	Y	Y	Y	--	--	--	--	--	Y			Y	Y	N	Y	--		N		
RIL, Hazira	405	NA	NA	N	Y	Y	--	--	--	--	--	Y	Y	Y	Y	Y	N	Y	--		N		
Source: In-house database from Mott MacDonald																							

Source: In-house database from Mott MacDonald

S no	Parameters	Basic Chemicals																								Specialty chemical s			Knowledge Agrochemica ls			chemicals Pharmaceutic als		
		Organic Chemicals									Inorganic Chemicals									Fertilizer s			Soaps and Toiletries											
		Petrochemicals			Methanol			Ethanol			Chlor-alkali			Carbon Black			Others																	
H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L		
1	Demand Supply Balance – International	✓			✓			✓			✓			✓			✓			✓			✓			✓			✓			✓		
2	Demand Supply Balance – Domestic	✓			✓			✓			✓			✓			✓			✓			✓			✓			✓			✓		
3	Investment Potential	✓			✓			✓			✓			✓			✓	✓		✓			✓	✓		✓			✓			✓		
4	Employment potential	✓			✓			✓			✓			✓			✓			✓			✓			✓			✓			✓		
5	Interest of Anchor Developer/indus try	✓			✓			✓			✓			✓			✓			✓			✓			✓			✓			✓		
6	Forward & Backward linkages	✓			✓			✓			✓			✓			✓			✓			✓			✓			✓			✓		
7	Infrastructure requirement	✓			✓			✓			✓			✓			✓	✓		✓			✓			✓			✓			✓		
8	Export Intensity	✓			✓			✓			✓			✓			✓			✓			✓			✓			✓			✓		
9	Presence in other PCP estates	✓			✓			✓			✓			✓			✓			✓			✓	✓		✓			✓			✓		
10	Industry Opinion	✓			✓			✓			✓			✓			✓			✓			✓	✓		✓			✓			✓		

H - High, M - Medium, L – Low

5.1.2.4 Inferences

Following are few key inferences one can draw from the Industrial sizing analysis.

- The above analysis reveals that the proposed GPCPSIR will ideally house oil refinery/s, petrochemicals, and chemicals and down stream units based on subsequent feasibility studies for the projects.
- However, refinery-petrochemical integration is amenable to the local situation. It is revealed from reference studies done abroad and in India, that product mix in all major chemical estates is based on refinery output and/or major building blocks.
- It would also house dual cracker units, as dual feed crackers are flexible to handle 100% gaseous or 100% liquid feedstock or a mixture of the two. Accordingly the downstream plants can be designed.
- The estate would require a substantial investment which would necessitate FDI i.e. existence of MNCs.
- The proposed area should have one or more than one SEZs with the necessary environment & infrastructure to attract investment.
- This industry requires the presence and linkages of infrastructure facilities like solid cargo port, chemical port, roads, container terminals, power plants, tank terminals, gas pipelines, effluent disposal pipeline. The presence of utilities and logistic service providers also adds to the investment potential.
- Keeping the above things in mind the following industry mix has been selected, which can be developed in phases

a. Refinery / Cracker based projects: The following table presents the probable value chain which has been developed taking care of the above mentioned explanations.

b. Alternative feedstock based projects:

- i. Petrochemical Working Group Study of Department of Chemical and Petrochemicals states that as per their Industry projections and trends in petrochemicals products along with the proven reserves of crude oil and natural gas, the Crude oil and Natural gas is likely to remain the main sources of feedstock for the petrochemicals for the next 10 to 15 years however, the pricing of the natural gas is going to be a crucial issue in attracting investment in gas cracker complexes.
- ii. The development will focus on maximizing the value addition by way of increased hydrocarbon utilization.
- iii. The increasing availability of Natural Gas with major percentage of methane content have already generated research activity on Gas to Liquid Technology (Natural gas to Methanol) which could be easily transported and used as chemical feedstock.
- iv. Various Research and Developments are also on Coal Bed Methane as a feedstock for chemicals.
- v. There is renewed interest due to high crude oil prices on the coal based monomers for the manufacture of chemicals like acetylene based chemicals through calcium carbide route and others.
- vi. Nowadays there are emphasis on 'Sustainability, industrial ecology, and green chemistry' that are guiding the development of the next generation of materials, products and processes. The alternative bio-based feed-stocks, like Agricultural and plant origin, Animal Origin, Microbial origin hold promise for achieving the goals of sustainable development and implementing the principles of industrial ecology.
- vii. Hence the following categories of industry can be developed and integrated with the hydrocarbon based industry mix for long term sustainability of the GPCPSIR:

c. Projects identified from stakeholder interaction:

From stakeholder interaction it is identified that a petrochemical complex of the size and type of GPCPSIR shall require several inputs in addition to the basic feedstock and energy. There is a potential of producing some of the following products for supplying to various industries in the region:

- Specialty catalysts
- Additives (for polymers and elastomers)
- Specialty chemicals
- Solvents
- Industrial gases
- Packaging material

d. Shipbuilding Activity

Being a coastal zone, shipbuilding activity can be encouraged here as a substantial area of GPCPSIR is coming under CRZ.

e. Other supportive Engineering Industry

Engineering industry which supports chemical and petrochemical base by way of fabricating/ supplying equipments, piping, process control and instrumentation, etc, and maintenance related services, dock and terminal activities becomes an integral part of the region for the self sustainability. In turn, engineering industry shall require support from metallurgical industry.

f. Oil terminal / warehousing / Area for Third-party Logistics:

This segment is very essential for a PCP estate. Oil terminal / Warehousing area typically has tankage, either above ground or underground, and gantries for the discharge of products into road tankers or other vehicles (such as barges) or pipelines. Ownership-wise it can be of individual, or of a consortium or of a third party service provider.

Considering above, a comprehensive list according to the size of industry is tabulated with respective estimated area requirement and employment generation. Hence in the following table, GPCPSIR industry sizing has been tabulated and the same range has been considered for the proposal for the DDP activity.

5.2 Stakeholder Consultation Process

5.2.1 Government Stakeholders

Involvement of the stakeholders in decision making process for the development plan has played an important role. The consultation exercise has revealed the requirements, issues and relevant projects in pipeline. Following are the details of the stakeholder consultations carried out for the project; key stakeholder consultation record and GPCPSIR contact list is attached in the Appendix I. The Stakeholders include Government offices at local, district, State and Central level, Industries and various other agencies active in the GPCPSIR area including the key infrastructure development agencies is elaborated in below

Table 5.12: Stakeholder Consultation with Government Offices

Stakeholder	Inputs from Consultation
Gujarat Industrial Development Corporation (GIDC)	<ul style="list-style-type: none"> • GIDC estates expansion plans have been discussed and incorporated appropriately in the land use proposal • Appropriate expansion areas for the existing and potential industries within the existing estates have been provided for in the proposed land use proposal in consultation with GIDC • The Gamtal expansion area in Dahej phase 3 & 4 has been incorporated one to one in the land use proposal as per the recommendation of GIDC officers

Stakeholder	Inputs from Consultation
	<ul style="list-style-type: none"> The infrastructure proposals for the GPCPSIR area have also been discussed with GIDC engineers and incorporated in the infrastructure plan including: <ul style="list-style-type: none"> Existing system of water supply and future planning discussed and incorporated both for Dahej and Vilayat Industrial estates. The planning of water supply system proposed for Atali Housing together with sewerage system and STP. Existing Effluent system has been discussed and incorporated. GIDC informed that water supply planning for the proposed Dahej Industrial area Phase II is being done by GPCPSIR Services Ltd. (GPSL). The agency may also be involved in the planning for Dahej III & IV Industrial areas. Discussion with GPSL is elaborated further below in this table.
Kalpasar Department, Gandhinagar,	<ul style="list-style-type: none"> The tentative alignment of Kalpasar diversion canal was provided by the Department The tentative alignment of Kalpasar diversion canal been considered in the DDP proposal with slightly modified (than that provided by Kalpasar Department) as it was cutting the GPCPSIR area across important land uses- thus an appropriate realignment has been suggested for the same
Ankleshwar Industrial Association, Ankleshwar	<p>Various aspects related to SSI were discussed and appropriately have been included in the industrial area planning for GPCPSIR area. The aspects discussed included the following</p> <ul style="list-style-type: none"> Discussion on Industrial Sizing and Worker density with regard to small scale industries in Ankaleshwar Industrial area Sharing of data related to the effluent generation and other utility requirement of Ankleshwar Industrial area especially related to the small scale chemical industries Information about the activities of the association related to environmental aspects in industrial areas.
Gujarat Maritime Board	<ul style="list-style-type: none"> The Shipbuilding Policy was discussed including the application of spatial extent of the policy from Dahej SEZ till Bhukhi khadi and river front requirements for the industry. Ro-Ro service under proposal between Dahej and Ghogha (small port in Bhavnagar) was discussed It was indicated that the southern end of the notified GPCPSIR, the northern bank of River Narmada does not have enough draft for jetty. Hence dredging would be necessary for any such shipment. GMB also confirmed that clearance for the various activities inclusive of the industrial development for handling hazardous substances and storage is required from MoEF.
Department of Civil Aviation, Ahmedabad	<ul style="list-style-type: none"> A requirement of 200 hectare was expressed comprising of medium scale Airport with cargo based facilities, hangers and a runway of 2-3 kms long. Two sites identified by the District Collector were discussed for airstrip proposal. However, they were not found best for the Airstrip proposal The Department also discussed about the long term proposal to integrate an Aviation multi product SEZ of about 1000 hectare with the Airstrip. In this light, it was discussed that the airstrip could be located near to GPCPSIR and not necessarily within the extent of GPCPSIR.
Bharuch Collector office	<ul style="list-style-type: none"> Discussion in general about the overall aspects of the projects. Detailed discussion and stakeholder meeting was convened on the confirmation of area of GPCPSIR area as well as on the Gamtal buffer area.

Stakeholder	Inputs from Consultation
Chitnis Department, Bharuch	<ul style="list-style-type: none"> The Jantry rate was provided. However, it is under proposal of revision
DILR, Bharuch	<ul style="list-style-type: none"> Land Records and Village Maps were purchased from the DILR office Detailed discussion on the confirmation of village wise area of GPCPSIR area as also done
GIDC, Regional Office, Ankaleshwar	<ul style="list-style-type: none"> Details regarding the Land acquisition status, allotment to industries & rates were collected & confirmed from the office Details on the mandate, status and work plans of GPCPSIR Welfare Society were discussed with the concerned officers. The same has been elaborated below
GPCPSIR Welfare Society, GIDC regional office, Ankaleshwar	<p>It is a Society registered under Societies Act. Its mandate is to resolve the issues and work for the development aspects of the people who have been affected by the GPCPSIR development activities. Their current activities are concentrated around the socio-economic issues of the project affected people from the Gamtals within Dahej 1 and 2</p> <p>The Society has conducted a Socio Economic study for the villages existing in GPCPSIR area. TERI organisation has prepared the report for the same. Currently the Society has immediate plans to implement few programs for the villages in Dahej 1 including training of villagers, collection of funds from the Industries who are also members of the Welfare Society.</p>
State Ministry of Forest & Environment, Gandhinagar	<ul style="list-style-type: none"> Discussion regarding Coastal Regulation Zone (CRZ) applicable for the GPCPSIR area was done. Accordingly CRZ has been proposed for the GPCPSIR as per the MoEF notification MoEF informed that for any construction activity in CRZ area necessary approvals need to be taken and the CRZ notification should be followed
Directorate of Petroleum, Gandhinagar	<ul style="list-style-type: none"> Informed that the oil extracted from the Ankeleshwar group of ML blocks is high quality crude which gets premium of 5-6%. Clearance for surface rights for oil well exploration is required from District collector, RDA, after the lease from the owner of the land. It was also discussed that for development in the PEL and future MLs, an alternative to the pipeline network can be Tanker transportation.
ONGC, GAIL, Gujarat State Petroleum Limited (GSPL), Reliance India Ltd.	<ul style="list-style-type: none"> Discussion and sharing of data including the cadastral maps of the respective pipelines network and the Right of Ways (Row) within the GPCPSIR site.
Petroleum and Natural Gas Regulatory Board (PNGRB), Directorate General of Hydrocarbons (DGH), Oil Industry Safety Directorate (OISD)	<ul style="list-style-type: none"> DGH discussed the status of the PEL, ML and NEPL blocks in the Cambay Basin and informed that substantial area of GPCPSIR area is falling under the NELP blocks for which the global rendering process is ongoing All agencies informed on and suggested to refer relevant guidelines and rules

Source: Stakeholder meetings, MM

5.2.2 Industrial and Infrastructure Agencies

Table 5.13: Stakeholder consultations with Industrial & infrastructure agencies

Stakeholder	Inputs from Consultation
GCPTCL	<p>GCPTCL is a commercial port and liquid storage terminal. Following are the key aspects discussed:</p> <ul style="list-style-type: none"> Site area and expansion: <ul style="list-style-type: none"> It was a green field project.

Stakeholder	Inputs from Consultation
	<ul style="list-style-type: none"> – 147ha acquired in 2000. – EIL has done the site plan – 70ha is used and 35ha is kept as green belt, rest 42 ha is available for expansion – GCTCPL can expand within their present site area. As adequate space is available. – Environmental Clearances has been obtained from CRZ, GPCB and especially for hazardous substance or explosives handling, clearance were obtained from MoEF and ONGB. • Jetty Capacity: 1.8 m. • Employee and Accommodation: <ul style="list-style-type: none"> – 10 Senior managers, 40 Officers, 40 lower grade employees from Lakhigam, Within this 40 lower grade employee, 10-15 people come from nearby villages while rest comes from Bharuch, – 3-4 employees stay in guest house. Most of the persons stay in Bharuch – Regular Bus Services to & from Bharuch for the employees • Clientele: Major customers is Reliance and IOCL • Product Spectrum: • Import Butane, and propane from Gulf. <ul style="list-style-type: none"> – IOCL exports naphtha to Singapore and other Asian countries. – Cost includes storage charges, port charges, volume wise charge is considered. • Present product handling: Naptha, Propane, Butadiene, Caustic SodaLye, 2 Ethyl Hexanol, Cyclo Hexane, Octane, Vegetable Oil (Godrej imports), Styrene, Methanol, N-Paraffin • Compatibility in handling few other products: Acetone, Alcohol, Aniline, Fatty Alcohols, Glycols, Toluene, Xylene, High Speed Diesel, Acetic Acid • It was their opinion that an airstrip may not be very useful for them.
Gujarat Natural Fertiliser Corporation (GNFC)	<ul style="list-style-type: none"> • GNFC has already bought land in Dahej phase 2 for their expansion plans • GNFC also discussed briefly on their product range. • The power supply to their units in GPCPSIR will be through the grid used for their plant at Bharuch
Adani Petronet (Dahej) Port Pvt. Ltd.	<ul style="list-style-type: none"> • The jetty construction work is in progress and slated for operation in another 1-2 years. The jetty would cater to solid cargo transportation. • The informed that their expansion possibilities will be primarily seaward side of the land • Adani Power Dahej Ltd project is also likely to be functional in next 2 months
Japanese Consortium formed for development of eco-city and smart communities in Dahej area	<ul style="list-style-type: none"> • As part of the DMIC development in the State, a Tripartite MoU has been signed among Delhi Mumbai Industrial Development Corridor, Gujarat infrastructure Development Board & Consortium of Japanese Companies on 30th April, 2010, to develop Eco-city and smart communities project in the state in line with such cities in Japan and China. The consortium of Itochu, Hitachi, Kyocera, and Hyflux Corporations of Japan are doing a feasibility study for the Dahej area. The DDP team has discussed the proposed development plan proposals tentatively with the Consortium team and incorporated an area of around 600 hectares in the GPCPSIR site where such eco-city concepts can be developed.
Industrial Survey conducted between October-December, 2009 for existing functional units in GPCPSIR area.	The major problems and issues raised by industries with respect to infrastructure are provided in the industrial sizing section discussed above.
Multimentech International Pvt. Ltd.	<ul style="list-style-type: none"> • Detailed discussion on the water supply related planning for GPCPSIR area

Stakeholder	Inputs from Consultation
	especially in Dahej estate phase 1 & 2
GEPIL, Gujarat Enviro Protection & Infrastructure Ltd., Luthra group company, Surat	<ul style="list-style-type: none"> They have large scale State level waste management plans under proposal. Land purchased in 2 villages near GPCPSIR area for the same(village Kadodara & Goladara) GEPIL has signed 2 MoU in 2009 250 acre for Waste recycling facilities under GRAMZ (GEPIL, Recycling & Management Zone)near Kadodara which is in north side of GPCPSIR. Identified 50 types of odd waste for treatment at GRAMZ GEPIL has signed MoU with Gol & GPCB and planned to develop 9 eco-centres, out of that one is at/near Dahej.
GWSSB	<ul style="list-style-type: none"> Existing water supply network is very old and requires augmentation. GWSSB has prepare augmentation plan and submitted to Chief Engineer – GWSSB. The rate of supply is 70 LPCD to the population of villages and will also same in their new proposal. Industries of Dahej are not being supplied by GWSSB; they have their own treatment system for their domestic use.
R&B Department	<ul style="list-style-type: none"> Re pavements of MDR, ODR and VR within GPCPSIR are under proposal. Widening and WBM with road surfacing is proposed for Vagra-Pakhajan-Jolva SH, submitted to Secretariat R&B. Other 9 to 10 road proposals are prepared and submitted to Commissioner Industries - GIDC. Few road widening and surfacing are under proposal.
NHAI - Bharuch	<ul style="list-style-type: none"> Proposed Baroda-Mumbai Express highway alignment was collected.
SSNNL office of CE - Baroda	<ul style="list-style-type: none"> 35 MGD water is already allocated to GIDC Dahej. Carrying capacity of the Luvara Branch Canal is about 100 MGD; the same will cater to the irrigation water to both side of the canal. It was also indicated by SSNL office that Northern region above the GPCPSIR would require irrigation water from the canal.
GPCPSIR Services Ltd. (GPSL)	<ul style="list-style-type: none"> Planning of 35 MGD additional water, which is approved by SSNNL, is proposed to cater Dahej II water requirement A pond/tank is proposed near Pipaliya village to receive water from Luvara branch canal of SSNNL. Another pond/tank is also proposed in Dahej II area. The water will be pumped in two stages to supply it to the existing ponds in Dahej I.
National Environmental Engineering and Research Institute (NEERI), Nagpur	<ul style="list-style-type: none"> NEERI is doing the EIA study for the GPCPSIR area. They have submitted the draft Terms of References (ToR) for the approval of the same form MoEF and the EIA study is ongoing for the GPCPSIR area. The baseline information collected by the DDP team has been shared with the NEERI team to be incorporated if required in the framing of the ToR for the DDP area.
Primary survey of various commercial set-ups in Dahej GIDC estate and in Ankeleshwar GIDC estate	<ul style="list-style-type: none"> Interaction with these units gave information on the employment ratio, investment details, prevailing development controls in the area. Informal sector interactions were on the socio-economic stratification for the projected population.

Source: Stakeholder meetings, MM

5.3 Land Suitability Analysis

Land suitability analysis for GPCPSIR area has been carried out in order to use the same along with other aspects as a base to finalise the land use and infrastructure proposal for GPCPSIR area. The key

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edited\DDP Final Vol I, Section 1.doc

parameters considered include: natural features of the site, existing land use, existing infrastructure, cropping intensity, nature of flooding in the area and the requirements of various key stakeholders. The parameter wise details of land suitability analysis is included below.

5.3.1 Natural features

5.3.1.1 Water bodies

Bhukhi khadi is the only source of inland water supply and discharge in the site. The stream and its drainage pattern are vulnerable to moderation of land levelling altering the water flow. Hence keeping in mind the main drain and its network, the area has been planned carefully.

Ponds, tanks and lakes are sensitive features of the local drainage and have been considered during development proposal. The purpose of land suitability is to avoid any development causing filling up of these water holes.

5.3.1.2 Salt pans

Salt pans along the coast form a sensitive ecosystem between marine and land environment. In addition to its environmental values, it caters as a source of income for the locals. Saltpan area needs to be retained as a buffer for tidal flood risk.

5.3.2 Flood prone areas

Fluvial Flood analysis in river Narmada indicated that about 57 to 74 sq.km of the area North of Narmada river is likely to be flooded for average flood of 9.6 lakh cusecs to about 30 lakh cusecs for 100 year to 200 year return period. The flood front was projected to advance to about 1 km north of River Narmada bank. To address the flood mitigation process completely a margin of around 15-20 years period is suggested for non-development of flood prone areas. The development in the flood mitigation zones are proposed in the last phase.

Pluvial flood prone areas have been considered for softer land use management. Appropriate lake enhancement, linking drainage channels to bhukhi khadi and green buffer area along bhukhi khadi has been proposed.

5.3.3 Existing landuse

g. Gamtal

Existing villages' settlements are called '*Gamtals*'. These *Gamtals* and its buffer which is around 300 meters from its periphery should be included for in-situ development. Hence land in the gamtal and its buffer is not suitable for proposing any processing activities.

h. NA conversion

Existing land use and land use conversions are primary factors of land suitability. Industrial, commercial land use and other land use conversions will need to be considered and included to maximum possible while planning the area further.

i. Existing estates

GIDC estates: Dahej1, 2 and Vilayet are already industrialised. Hence areas along the existing GIDC estates have been considered most suitable for industrial use. The proposal has also considered linking these estates by a sprawl of planned industrial growth across the site.

5.3.4 Projects under Proposal

5.3.4.1 Expansion plans of GMB

j. Ship building

Considering the MOU's signed by various ship building agencies and Shipbuilding policy by GMB, the southern coastal stretch has been found suitable for Shipbuilding use.

k. Port expansion

Suitable land area of the GMB proposed Sterling port and its expansion along coast has been incorporated in the proposed port planning.

5.3.4.2 Land Acquisition plans of GIDC

The expansion plans for Dahej and Vilayat estates are integrated with the proposed land use plan. Atali residential township and Atali expansion area have also been integrated with the non processing areas in the proposed land use plan.

5.3.5 Cropping Intensity

Double cropped area along River Narmada and along Sardar Sarovar Narmada Canal is proposed for agricultural use. Other high intensity cropping area along Sardar Sarovar Narmada Canal is proposed to be included for industrial estate only in the last phase of development.

5.3.6 Coastal Regulation Zone (CRZ)

As per the CRZ notification by Ministry of Environment, Forests and Wildlife, the coastal area within 500 m of the High tide line towards the landward side is under the development regulation of CRZ. The coastal stretch along the GPCPSIR boundary is classified into CRZ Category-III⁵ and the permissible land use as per CRZ notification has been proposed for this area. A list of petroleum products permitted for storage in port area⁶ is also included in **Appendix J**.

As per the CRZ notification, the coastal stretch in GPCPSIR is classified as CRZ category-III.

5.3.7 Oil & Gas infrastructure

ONGC mining lease block ANM-15 & 16 around the Dahej GIDC estate has oil wells with interconnecting mesh of oil and gas pipelines to gas gathering and pumping stations. Hence apart from the already developing Dahej GIDC estate, appropriate developable land uses for these areas from the point of view of safety include warehousing, ICD Transport Nagar and other logistics related activities.

A network of Gas pipelines of GAIL, GSPL and Reliance India Limited runs across GPCPSIR site. As per the Petroleum and Minerals Pipelines Act, 1962, restriction of use of land for construction and plantation is maintained by a buffer along the pipelines in the Development plan proposal.

⁵ As defined in the CRZ Notification – 'CRZ Category III: areas that are relatively undisturbed and those which do not belong to either Category- I or II. These will include coastal zone in the rural areas (developed and undeveloped) and also areas within Municipal limits or in other legally designated urban areas which are not substantially built up.'

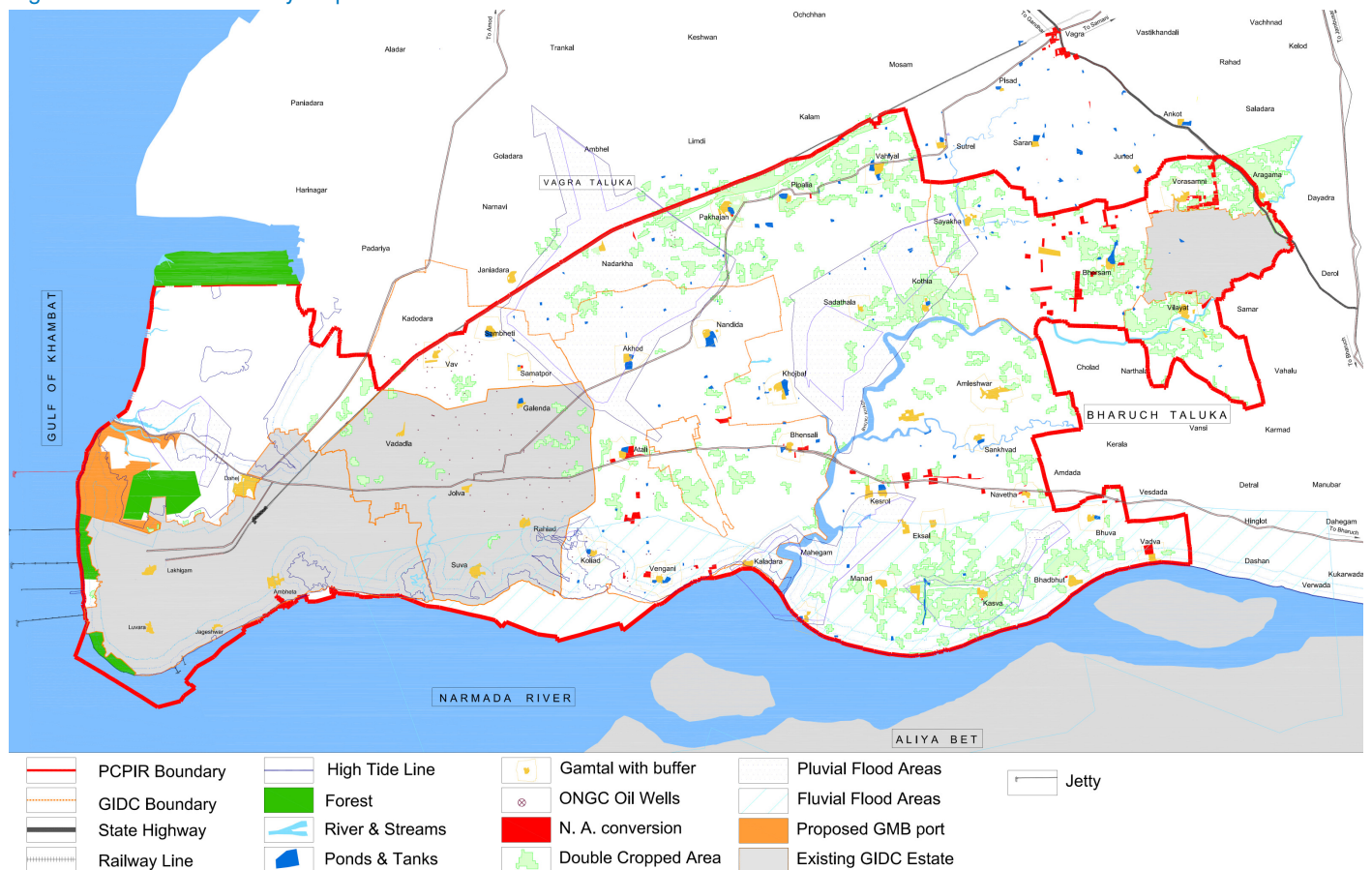
⁶ The list of petroleum products is permitted for storage is attached in the CRZ notification.

5.3.8 Existing Roads & Proposed expressway

The link road or the expressway proposed through the GPCPSIR site has been a governing factor for processing and non processing land use distribution.

5.3.9 Land Suitability Analysis Map

Figure 5.16: Land Suitability Map



Source: MM, Mapping of data from various sources

5.4 Overall brief Inference and Recommendations

The current report (Volume I, section1) includes details and information on various aspects of the DDP preparation process for GPCPSIR including the background of this project, regional context of the area, baseline information for the area, the process and conclusions of the base map preparation exercise, and the analysis of certain aspects of the site and project on the basis of which the proposal can be concluded for the GPCPSIR area.

In terms of the regional context elaborated in chapter 2 Gujarat has an increasing presence of upstream, downstream and midstream companies in the sector, therefore the state is also called the chemical and petrochemical hub of India. The Government of Gujarat has proposed to locate the GPCPSIR in Dahej. Dahej is an industrialised location and has the presence of chemical & petrochemical units. It is also close to the other industrial pockets of Ankleshwar, Jhagadia and Panoli wherein chemical manufacturing units are present. The location has abundant availability of natural gas. GPCPSIR is a strategically located Industrial area dedicated for Petrochemical Chemical & Petrochemical (PCP) industries. Apart from other excellent linkages to the region; it has the advantage of being a part of the DMIC influence zone and being close to the DFC.

Details on the baseline information about the GPCPSIR area including the existing status of various infrastructure and utilities, social infrastructure, Physiography, demography and socio-economic profile etc has been included in Chapter 3 of this Volume. The land area notified for the GPCPSIR development is around 453 sq.Km and the same has been checked and verified with the help of cross checking on the basis of different records, ground truthing and stakeholder consultations during the preparation of the DDP. The details of the same are elaborated in Chapter 4. Some variation been found in the village wise area and the same has been revised, corrected and finalised in consultation with the client. The Base Map chapter and the Baseline information include the details of the land area and land use also. The base map and baseline information of GPCPSIR area has been used as a base as required in the proposals which are elaborated in Volume II of the DDP report

The situation analysis elaborated in chapter 5 has been the basis for the preparation of the land use and infrastructure proposals for the GPCPSIR area. Analysis has included two studies viz. Flood Risk Assessment and Industrial sizing. The FRA study has provided the mapped information on the areas prone to flooding and various flood mitigation measures that could be adopted for the situation. The industrial sizing related study and survey has indicated the range of PCP sectors and products that would be a focus for the GPCPSIR area. The related PCP industrial chain has provided a basis for the co-siting aspects to be considered for the proposed land use zoning in the processing area to be proposed. More details of both the studies: FRA and Industrial sizing have been included as a separate detailed report named **Volume I – Section 2** for reference

The key aspects discussed with the Government, Industries, Implementing agencies and other key stakeholders have provided a basis for incorporating the same as appropriate in the development plan proposals. Similarly the land suitability analysis has provided a basis for the land use zoning for the GPCPSIR area. The land use and infrastructure projection and proposals have been detailed out in a separate report named **Volume II** of the DDP report. It is recommended that the Volume II is read in conjunction with this volume to comprehend it in best way.

sd/	sd/	sd/
Chairman, GPCPSIRDA	Member Secretary, GPCPSIRDA	Chief Town Planner, GPCPSIRDA

Appendices

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Appendix A. GPCPSIR Location Map

Appendix B. GPCPSIR Gazette Notification



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The Gujarat Government Gazette

PUBLISHED BY AUTHORITY

Vol. L]

THURSDAY, JUNE 18, 2009/JYAISTHA 28, 1931

Separate paging is given to this Part in order that it may be filed as a Separate Compilation.

PART IV-B

Rules and Orders (Other than those published in Part I, I-A and I-L) made by the Government of Gujarat under the Gujarat Acts.

INDUSTRIES AND MINES DEPARTMENT

Notification

Sachivalaya, Gandhinagar, 9th June, 2009

Gujarat Special Investment Region Act, 2009.

No. GHU-17/SIR/112009/101492/1:—In exercise of the powers conferred by section 3 read with section 4 of the Gujarat Special Investment Region Act, 2009 (Guj. 2 of 2009), the Government of Gujarat hereby,—

- Declares the areas specified in column 4 of the villages and the talukas, as specified in column 3 and 2 of the Schedule appended to this notification, of the Bharuch district, as Special Investment Region which shall be known as “the Gujarat Petroleum, Chemicals and Petrochemicals Special Investment Region”; and
- Determines the areas within the boundaries of revenue villages specified in column 4 of the said Schedule to be the geographical area of the said Special Investment Region, measuring 45298.59 Hectares in total.

SCHEDULE

Details of the areas, villages and talukas of

the Bharuch district to be known as

“The Gujarat Petroleum Chemical & Petrochemical Special Investment Region”

Sr. No.	Taluka	Village	Name of the Revenue Village			
			4			
			Extent within PCPIR	Survey No.	Land Mark	Total Area of lands (in Ha.)
1	Vagra	Aragama	Partly	420-423 454-494 496-556 560	Boundary of Vilayat Estate	230.74
2	Vagra	Vorasamni	Partly	373-377 379-382 388-392	Boundary of Vilayat Estate	233.45

Sr. No.	Taluka	Village	Name of the Revenue Village			
			4			
1	2	3	Extent within PCPIR	Survey No.	Land Mark	Total Area of lands (in Ha.)
				403-404 408-499 500-599 600-661 820-833		
3	Vagra	Vilayat	Completely	All Survey Nos. 1-1239		1674.56
4	Vagra	Bhersam	Completely	All Survey Nos. 1-1014		1435.10
5	Vagra	Sayakha	Completely	All Survey Nos. 1-410		1567.71
6	Vagra	Kothia	Completely	All Survey Nos. 1-233		606.26
7	Vagra	Vahiyal	Partly	1-43 48 50-717 721-747	Survey numbers below Railway Line	1778.26
8	Vagra	Pipalia	Partly	1-69 83-320	Survey numbers below Railway Line	424.61
9	Vagra	Pakhajan	Partly	1-3 39-528	Survey numbers below Railway Line	1038.66
10	Vagra	Nadarkha	Partly	1-119 213-248	Survey numbers below Railway Line	306.42
11	Vagra	Sambheti	Partly	1-5 10 25-166	Survey numbers below Railway Line	226.58
12	Vagra	Janiadara	Partly	18-55 300-399 400-427 248-256 262-299	Survey numbers below Railway Line	311.79
13	Vagra	Akhod	Completely	All Survey Nos. 1-233		562.27
14	Vagra	Nandida	Completely	All Survey Nos. 1-604		1222.80
15	Vagra	Sadathala	Completely	All Survey Nos. 1-149		449.76
16	Vagra	Khojbal	Completely	All Survey Nos. 1-427		1222.53
17	Vagra	Bhensali	Completely	All Survey Nos. 1-265		563.47
18	Vagra	Atali	Completely	All Survey Nos. 1-384		1082.73
19	Vagra	Galenda	Completely	All Survey Nos. 1-259		579.18
20	Vagra	Samatpor	Completely	All Survey Nos. 1-138		293.05
21	Vagra	Vav	Partly	All Survey Nos. 1-247	Survey numbers below Railway line	321.34
22	Vagra	Jolva	Completely	All Survey Nos. 1-256		874.81
23	Vagra	Vadadla	Completely	All Survey Nos. 1-297		685.87
24	Vagra	Dahej	Completely	All Survey Nos. 1-994		3670.10
25	Vagra	Lakhigam	Completely	All Survey Nos. 1-775		1061.73
26	Vagra	Luvara	Completely	All Survey Nos. 1-290		895.81

Sr. No.	Taluka	Village	Name of the Revenue Village			
1	2	3	4			
			Extent within PCPIR	Survey No.	Land Mark	Total Area of lands (in Ha.)
27	Vagra	Jageshwar	Completely	All Survey Nos. 1-51		1272.32
28	Vagra	Ambheta	Completely	All Survey Nos. 1-544		3745.21
29	Vagra	Suva	Completely	All Survey Nos. 1-779		1431.58
30	Vagra	Rahiad	Completely	All Survey Nos. 1-951		1441.92
31	Vagra	Koliad	Completely	All Survey Nos. 1-235		3727.68
32	Vagra	Vengani	Completely	All Survey Nos. 1-160		441.87
33	Vagra	Kaladara	Completely	All Survey Nos. 1-443		1739.03
34	Bharuch	Amleshwar	Partly	1-797 850-894 934-966 968 984-987 1002-1006 1009-1062		1971.14
35	Bharuch	Bhuva	Completely	All Survey Nos. 1-315		348.42
36	Bharuch	Eksal	Completely	All Survey Nos.		793.04
37	Bharuch	Kesrol	Completely	All Survey Nos. 1-262		581.11
38	Bharuch	Navetha	Completely	All Survey Nos. 1-180		457.97
39	Bharuch	Manad	Completely	All Survey Nos. 1-239		1061.87
40	Bharuch	Mahegam	Completely	All Survey Nos. 1-157		560.82
41	Bharuch	Bhadbhut	Completely	All Survey Nos. 1-208		909.37
42	Bharuch	Kasva-Samni	Completely	All Survey Nos. 1-256		613.74
43	Bharuch	Vadva	Completely	All Survey Nos. 1-95		380.90
44	Bharuch	Sankhwad	Completely	All Survey Nos. 1-199		501.01
						45298.59

By order and in the name of the Governor of Gujarat,


MAHESHWAR SAHU,
Principal Secretary to Government.

Appendix C. Existing Land Use

C.1. Land records for village area verification

C.1.1. DILR: Village Koliad

નંબર		પ્રકાર	કુલ એકર ગુંઠા			નંબર ગોમથી હેટ માહિત	જરાયત			એકર લુ.ઠા	કચારી				
સરવે	ચોત		એકર ગુંઠા	ખરાબો એકર ગુંઠા	બાકી એકર ગુંઠા		એકર ગુંઠા	જમીની પ્રતના આના	કાયમ દર		કાયમ દર પ્રમાણે આકાર રોપવા	જમીન બાબત		પાણી	
												પ્રતના આના	કાયમ દર	કાયમ દર પ્રમાણે આકાર રોપવા	પ્રતના આના
૧	૨	૩	૪	૫	૬	૭	૮	૯	૧૦	૧૧	૧૨	૧૩	૧૪	૧૫	૧૬
		૨૧/૨				૨૧/૨									
૧		કોંગ્રેસ - ૨૧/૨													
૦૧		૪૬૪-૫૦-૧૨	૨૪૨૭=૨૨	૪૩૬-૪૧-૨૦	૦.૮૩-૮૭							૫૧-૮૮-૪૬	૧૧૮=૦૦		
૧૩		૦-૪૩-૦૪	૦-૮=૦૭												
		૪૬૪-૦૭-૦૭	૨૪ ૨૪=૧૦	૪૩૬-૪૧-૨૦	૦.૮૩-૮૭							૫૧-૮૮-૪૮	૧૧૮=૦૦		
		૦-૨૧-૧૮	૧૧=૮૪												
		૪૬૨-૧૧-૮૮	૨૪૦૮=૨૮	૪૩૬-૪૧-૨૦	૦.૮૩-૮૭							૫૧-૮૮-૪૮	૧૧૮=૦૦		
		૪-૭૪-૧૩	૨૫=૪૮												
		૪૫૭-૪૧-૭૫	૨૩૮૧=૭૧	૪૩૬-૪૧-૨૦	૦.૮૩-૮૭							૫૧-૮૮-૪૮	૧૧૮=૦૦		
		૦-૧૨-૬૨	૦-૬૩												
		૪૫૭-૨૮-૧૪	૨૩૮૧=૦૮	૪૩૬-૪૧-૨૦	૦.૮૩-૮૭							૫૧-૦૬-૨૦	૧૧૮=૦૦		

બીજા કલાસ ઢેકડીથી પાણી પીએ છે તે										ભાડા જમીન		કુલ કોષ્ટક ૧૧-૧૫-૧૮- ૨૨-૨૫-૨૬ નો સરવાળો	ધરણીકથી કાયમ કરીએ તે રૂપીયા	બાગાએ કસરના રૂપીયા	
જમીન બાબત			પાણી બાબત			જમીનના પ્રતના આના	કાયમ કર	કાયમ કર પ્રમાણે આકાર રૂપિયા							
પ્રતના આના	કાયમ કર	કાયમ કર પ્રમાણે આકાર રૂપિયા	પ્રતના આના	કાયમ કર	કાયમ કર પ્રમાણે આકાર રૂપિયા										
૧૯	૨૦	૨૧	૨૨	૨૩	૨૪	૨૫	૨૬	૨૭	૨૮	૨૯	૩૦	૩૧	૩૨	૩૩	
<div>૬૧/૨ (૬૧) </div>															

C.1.2. Tariz no. 1: Village Koliad

કોલીયાદ . Kolwad.

(અ) ખેડવા લાયક	દોગફલ	શાકાર
અ.૧ જુની શરત	૩૩૦=૬૬=૮૧	૧૭૫૮=૪૫
નવા શરત	૫૫=૩૬=૫૮	૩૭૫=૭૫
નિ.સ.પ્ર.	૫૩=૪૪=૫૪ ૦=૫૭=૬૭	૫૬૦=૦૦ ૩=૦૧
અ.૨ બામડાકાનીપસાર	૬૭=૨૩=૫૪	૫૩=૮૭
જામ	૪૩૬=૫૧=૧૦	-
અગું ફલ	૪૫૭=૨૬=૧૪	૨૩૮૧=૦૮
બ.૧ ખેડવા ન અપાયતો	૮૬૬=૮૦=૨૪	-
(૧) શાખા નંદરનો ખાદો	-	-
(૨) પેટા ખરાદો	૦=૮૩=૮૭	-
(૩) નદી બાબા પવો	-	-
બ-૧૭ ફલ	૦=૮૩=૮૭	-
બ.૨ સાવજનકુ જામોમાટે અ. પૈકી ગામલ	૧=૦૪=૨૧	૧=૫૦
(૧) ગામલ	૪=૪૩=૧૩	
(૨) ગોચર	૨૮=૬૨=૮૦	૧૦૨=૮૦
(૩) તલાવા તલાવડી	૫=૭૬=૬૬	-
(૪) ખડી	૧=૧૬=૩૫	૭=૦૦
(૫) અસાહી	-	-
(૬) કુટ્ટાન	-	-
(૭) કાઠા (કોકરડા)	૦=૮૦=૮૪	-
(૮) મારગ	૧૬=૮૭=૦૮	-
બ-૨૭ ફલ	૪૨=૦૬=૨૦	૧૧૧=૩૦
બ.૩ સવ નંદર પૈકી ખેડવાની ખાદાના કામ માટે કોલ	૮=૧૮=૩૫ ૬=૩૧=૬૪	૫=૫૦ ૬=૭૦
બ-૩૭ ફલ	૧૪=૦૫=૮૪	૫૨=૨૦
બ-૧, ૨, ૩૭ ફલ	૭૮=૭૬=૫	૧૬૩=૫૫
ગામગું ફલ મોદર	૮૭૪=૨૫=૪૦	૨૫૪=૫૮

નડાકાની રતો ૨૦૦૮-૨૦૦૯ વર્ષ

તલાટી અમ મંત્રી
ગ્રામ પંચાયત - કોલીયાદ
તા. વાગરા, જ. ભરૂચ

C.2. Village ELU compilation

C.2.1. Form 8 A: Village Bhuva

Village: BHUVA ; Form: 8A; Source: Mamlatdar Office									
SRL	Village	Survey No.	Area	Landuse	SRL	Village	Survey No.	Area	Landuse
001	BHUVA	56	0.0607	Agriculture		BHUVA	156P1	0.9308	Agriculture
002	BHUVA	46	0.1417	Agriculture	035	BHUVA	186	0.344	Agriculture
	BHUVA	72	0.5261	Agriculture		BHUVA	196	0.7588	Agriculture
	BHUVA	81	1.032	Agriculture		BHUVA	202	0.1416	Agriculture
	BHUVA	86	0.0607	Agriculture		BHUVA	226	1.0117	Agriculture
003	BHUVA	242P1	5.6315	Agriculture	036	BHUVA	9	1.1432	Agriculture
004	BHUVA	64	4.1177	Agriculture	037	BHUVA	244P1	0.9092	Agriculture
	BHUVA	219	1.5783	Agriculture	038	BHUVA	20	0.6273	Agriculture
	BHUVA	220	3.0886	Agriculture		BHUVA	30	0.1113	Agriculture
005	BHUVA	246AP1	2.2636	Agriculture		BHUVA	36	0.8498	Agriculture
	BHUVA	246BP2	0.032	Agriculture		BHUVA	48	0.8296	Agriculture
006	BHUVA	121	0.4452	Agriculture		BHUVA	76	0.2328	Agriculture
	BHUVA	129	0.1416	Agriculture		BHUVA	79	0.7285	Agriculture
	BHUVA	172	1.3456	Agriculture		BHUVA	115	1.2545	Agriculture
007	BHUVA	118	0.4047	Agriculture	039	BHUVA	41	0.2529	Agriculture
008	BHUVA	245P1	6.0754	Agriculture		BHUVA	84	1.6299	Agriculture
009	BHUVA	14	0.172	Agriculture		BHUVA	236	2.2448	Agriculture
	BHUVA	49	0.8296	Agriculture	040	BHUVA	67	0.4856	Agriculture
	BHUVA	100	0.3946	Agriculture	041	BHUVA	3	0.0506	Agriculture
	BHUVA	114	1.1938	Agriculture	042	BHUVA	97	1.3152	Agriculture
	BHUVA	162	1.2849	Agriculture		BHUVA	163	1.2748	Agriculture
	BHUVA	211	0.0405	Agriculture	043	BHUVA	111	0.8094	Agriculture
010	BHUVA	241P1	3.0328	Agriculture		BHUVA	154	3.5412	Agriculture
011	BHUVA	90	2.4888	Agriculture	044	BHUVA	27	0.0405	Agriculture
012	BHUVA	17	0.5969	Agriculture		BHUVA	78	0.2327	Agriculture
	BHUVA	65	0.9611	Agriculture		BHUVA	112	1.3051	Agriculture
	BHUVA	80	1.2141	Agriculture		BHUVA	184	0.6677	Agriculture
	BHUVA	160	0.8494	Agriculture		BHUVA	214A	0.007	Agriculture
	BHUVA	161	0.8195	Agriculture		BHUVA	214BP2	0.0673	Agriculture
	BHUVA	250	1.4164	Agriculture	045	BHUVA	224	2.0538	Agriculture
013	BHUVA	7	0.4755	Agriculture		BHUVA	258	0.1416	Agriculture
014	BHUVA	21	2.1448	Agriculture		BHUVA	260	0.0101	Agriculture
015	BHUVA	128	0.344	Agriculture	046	BHUVA	237	0.3146	Agriculture
	BHUVA	166	0.8296	Agriculture	047	BHUVA	216	0.8499	Agriculture
	BHUVA	189	0.2428	Agriculture	048	BHUVA	8	0.1619	Agriculture
016	BHUVA	44	0.8903	Agriculture		BHUVA	142	0.5969	Agriculture
017	BHUVA	126	3.0227	Agriculture		BHUVA	167	1.8919	Agriculture
018	BHUVA	252P1	2.5948	Agriculture		BHUVA	183	0.3281	Agriculture
019	BHUVA	74	2.3674	Agriculture		BHUVA	193	0.4755	Agriculture
020	BHUVA	176	1.5146	Agriculture		BHUVA	227	1.032	Agriculture
021	BHUVA	31	0.5463	Agriculture		BHUVA	243P1	1.0282	Agriculture
	BHUVA	62	0.1113	Agriculture	049	BHUVA	174	0.7082	Agriculture
	BHUVA	164	0.951	Agriculture	050	BHUVA	92	0.0101	Pote Kharaba
022	BHUVA	25	0.2327	Agriculture	051	BHUVA	208	0.1518	Agriculture
	BHUVA	50	0.6378	Agriculture		BHUVA	212	0.1214	Agriculture
	BHUVA	61	0.0506	Agriculture	052	BHUVA	18	0.8903	Agriculture
	BHUVA	66	1.4063	Agriculture		BHUVA	229	0.7082	Agriculture
	BHUVA	82	0.0304	Agriculture	053	BHUVA	105	0.263	Agriculture
	BHUVA	195	0.4249	Agriculture	054	BHUVA	11	0.5767	Agriculture
	BHUVA	253	1.2039	Agriculture		BHUVA	106	0.4957	Agriculture
023	BHUVA	107	0.4148	Agriculture		BHUVA	127	0.3035	Agriculture
024	BHUVA	231	0.1315	Agriculture		BHUVA	132	0.9409	Agriculture
	BHUVA	232	0.779	Agriculture		BHUVA	140P1	1.1798	Agriculture
025	BHUVA	109	0.6475	Agriculture		BHUVA	143	1.6795	Agriculture
026	BHUVA	144P1	1.7038	Agriculture		BHUVA	178	0.9915	Agriculture
	BHUVA	151	0.2327	Agriculture	055	BHUVA	149P1	0.5473	Agriculture
	BHUVA	218	0.9815	Agriculture		BHUVA	249	2.2966	Agriculture
	BHUVA	230	0.7789	Agriculture	056	BHUVA	108	0.354	Agriculture
	BHUVA	239	0.4419	Agriculture	057	BHUVA	122	1.2545	Agriculture
027	BHUVA	42	0.4047	Agriculture		BHUVA	124	0.3541	Agriculture
	BHUVA	71	1.9627	Agriculture		BHUVA	125A	0.6913	Agriculture
	BHUVA	191	0.7183	Agriculture		BHUVA	125P2	0.18	Agriculture
028	BHUVA	136	1.9829	Agriculture		BHUVA	199	2.4484	Agriculture
029	BHUVA	22	0.8296	Agriculture	058	BHUVA	1	0.1618	Agriculture
030	BHUVA	147	0.2087	Agriculture		BHUVA	10	0.5969	Agriculture
031	BHUVA	123	1.467	Agriculture		BHUVA	40	0.2831	Agriculture
	BHUVA	155	0.7689	Agriculture		BHUVA	197	0.5463	Agriculture
	BHUVA	203	0.7587	Agriculture		BHUVA	223	1.6795	Agriculture
032	BHUVA	177	3.4903	Agriculture	059	BHUVA	103	1.2748	Agriculture
033	BHUVA	47	0.3237	Agriculture	060	BHUVA	190	2.1145	Agriculture
034	BHUVA	96	1.2242	Agriculture	061	BHUVA	157	0.86	Agriculture
	BHUVA	148	0.5766	Agriculture		BHUVA	180	2.1246	Agriculture
062	BHUVA	131	1.032	Agriculture		BHUVA	192	1.7098	Agriculture
	BHUVA	137	0.3224	Agriculture		BHUVA	251	1.6289	Agriculture
063	BHUVA	19	0.1012	Agriculture		BHUVA	206	1.3271	Agriculture
	BHUVA	32P1	0.4047	Agriculture	095	BHUVA	188	0.2529	Agriculture
	BHUVA	38P1	0.2732	Agriculture	096	BHUVA	130	0.0506	Agriculture
					097	BHUVA	29	0.4147	Agriculture

Village: BHUVA ; Form: 8A; Source: Mamlatdar Office										
SRL	Village	Survey No.	Area	Landuse		SRL	Village	Survey No.	Area	Landuse
098	BHUVA	262	2.4585	Agriculture			BHUVA	252P2	0.066	canal
099	BHUVA	32P2	0.4047	Agriculture			BHUVA	254P3	0.206	canal
	BHUVA	209P1	0.3237	Agriculture			BHUVA	257P3	0.5904	canal
	BHUVA	225P1	0.8144	Agriculture			BHUVA	261P3	0.26	canal
064	BHUVA	69	6.1917	Agriculture			BHUVA	38P2	0.2832	Agriculture
065	BHUVA	52	0.4957	Agriculture			BHUVA	156P2	0.9308	Agriculture
	BHUVA	104	0.7386	Agriculture			BHUVA	209P2	0.3237	Agriculture
066	BHUVA	204	0.5767	Agriculture			BHUVA	225P2	0.8145	Agriculture
067	BHUVA	33	0.5564	Agriculture		100	BHUVA	150P1	1.7867	Agriculture
068	BHUVA	153	0.1821	Agriculture		101	BHUVA	158AP1	1.8575	Agriculture
069	BHUVA	207	0.2327	Agriculture			BHUVA	158BP2	0.0065	Agriculture
070	BHUVA	55	0.0506	Agriculture		102	BHUVA	102	1.2343	Agriculture
071	BHUVA	133	0.7847	Agriculture		103	BHUVA	248P1	1.3709	Agriculture
072	BHUVA	198	1.3658	Agriculture		104	BHUVA	94	1.2849	Agriculture
073	BHUVA	182	0.9075	Agriculture		105	BHUVA	213A	0.02	Agriculture
074	BHUVA	28	0.3339	Agriculture			BHUVA	213BP2	0.1193	Agriculture
	BHUVA	39	1.1938	Agriculture		106	BHUVA	74	6.819	Agriculture
	BHUVA	51	0.6981	Agriculture		107	BHUVA	200	1.9425	Agriculture
	BHUVA	171	1.7402	Agriculture		108	BHUVA	222	2.0538	Agriculture
075	BHUVA	6	0.9915	Agriculture		109	BHUVA	85P1	0.2952	NA
	BHUVA	135A	0.9839	Agriculture		110	BHUVA	165	1.2343	Agriculture
	BHUVA	135P2	1.07	Agriculture		111	BHUVA	85P2	0.6559	NA
	BHUVA	141	0.5063	Agriculture		112	BHUVA	221P1	1.305	Agriculture
	BHUVA	194	0.4452	Agriculture		113	BHUVA	34	1.2039	Agriculture
	BHUVA	217	1.0421	Agriculture		114	BHUVA	120	0.344	Agriculture
076	BHUVA	15	0.1821	Agriculture			BHUVA	185	0.6981	Agriculture
	BHUVA	35	0.5463	Agriculture		115	BHUVA	89	2.5192	Agriculture
	BHUVA	68	0.6374	Agriculture		116	BHUVA	247A	1.5403	Agriculture
	BHUVA	152	0.1113	Agriculture			BHUVA	247AP2	2.904	Agriculture
	BHUVA	210	0.0405	Agriculture		117	BHUVA	45	0.5362	Agriculture
077	BHUVA	139P1	1.6952	Agriculture		118	BHUVA	37	0.9105	Agriculture
078	BHUVA	205	2.1651	Agriculture			BHUVA	228	0.8296	Agriculture
	BHUVA	255	1.0421	Agriculture		119	BHUVA	248P2	1.3709	Agriculture
079	BHUVA	173	0.7588	Agriculture		120	BHUVA	179	1.1534	Agriculture
080	BHUVA	59	0.1113	Graveyard		121	BHUVA	24	0.1619	Agriculture
081	BHUVA	181	1.0724	Agriculture		122	BHUVA	93	0.6981	Agriculture
082	BHUVA	117	0.5969	Agriculture		123	BHUVA	139B	0.7431	Agriculture
083	BHUVA	23	1.5075	Agriculture			BHUVA	138P1	0.036	Agriculture
084	BHUVA	70	4.6539	Agriculture		124	BHUVA	201	0.1619	Agriculture
085	BHUVA	113	1.1635	Agriculture		125	BHUVA	53	0.0708	Gauchar
086	BHUVA	4	0.0607	Agriculture			BHUVA	54	0.0708	Gauchar
	BHUVA	13	0.607	Agriculture		126	BHUVA	58	0.8296	Khadi
	BHUVA	57	0.0506	Agriculture		127	BHUVA	215	0.9105	Gamtal
	BHUVA	256	0.8094	Agriculture		128	BHUVA	235	2.3067	Pond
087	BHUVA	175	0.8097	Agriculture		129	BHUVA	125P3	0.1	canal
088	BHUVA	99	0.9409	Agriculture			BHUVA	126P2	0.235	canal
	BHUVA	119	0.1922	Agriculture			BHUVA	133P2	0.045	canal
	BHUVA	238	1.2343	Agriculture			BHUVA	134P2	0.063	canal
089	BHUVA	254AP1	11.3798	Agriculture			BHUVA	135P3	0.1921	canal
	BHUVA	254BP2	0.14	Agriculture			BHUVA	136P2	0.081	canal
090	BHUVA	257AP1	10.9956	Agriculture			BHUVA	137P2	0.0216	canal
	BHUVA	257AP2	0.15	Agriculture			BHUVA	138P2	0.1618	canal
091	BHUVA	134	0.4226	Agriculture			BHUVA	139P2	0.045	canal
092	BHUVA	83	0.435	Agriculture			BHUVA	140P2	0.014	canal
	BHUVA	91	0.1922	Agriculture			BHUVA	144P2	0.0016	canal
	BHUVA	146AP1	2.1927	Agriculture			BHUVA	145P3	0.145	canal
	BHUVA	146BP2	1.4496	Agriculture			BHUVA	146P3	0.1416	canal
	BHUVA	169	4.1683	Agriculture			BHUVA	147P2	0.024	canal
	BHUVA	240P1	0.7654	Agriculture			BHUVA	149P2	0.084	canal
093	BHUVA	233	0.0203	Agriculture			BHUVA	150P2	0.004	canal
	BHUVA	234A	0.55	Agriculture			BHUVA	158P3	0.038	canal
	BHUVA	234BP2	17.5538	Agriculture			BHUVA	182P2	0.084	canal
	BHUVA	259	0.0101	Agriculture			BHUVA	183P2	0.026	canal
	BHUVA	261A	0.4148	Agriculture			BHUVA	213P3	0.063	canal
	BHUVA	261BP2	4.0194	Agriculture			BHUVA	214P3	0.037	canal
094	BHUVA	5	0.8397	Agriculture			BHUVA	220P2	0.24	canal
	BHUVA	16	0.7883	Agriculture			BHUVA	221P2	1.376	canal
	BHUVA	60	0.3642	Agriculture			BHUVA	234P3	0.36	canal
	BHUVA	63	3.015	Agriculture			BHUVA	236P2	0.072	canal
	BHUVA	110	1.2647	Agriculture			BHUVA	239P2	0.064	canal
	BHUVA	242P2	0.712	canal			BHUVA	240P2	0.064	canal
	BHUVA	243P2	0.024	canal			BHUVA	241P2	0.144	canal
	BHUVA	244P2	0.0216	canal			BHUVA	159	2.5293	Agriculture
	BHUVA	245P2	0.1264	canal		130	BHUVA	43	1.2748	Agriculture
	BHUVA	246P3	0.952	canal		131	BHUVA	77	0.6374	Agriculture
	BHUVA	247P2	0.024	canal		132	BHUVA	85	1.0827	Agriculture
	BHUVA	247P3	0.226	canal			BHUVA	116	1.2141	Agriculture

Village: BHUVA ; Form: 8A; Source: Mamlatdar Office

SRL	Village	Survey No.	Area	Landuse
133	BHUVA	145AP3	1.9677	Agriculture
134	BHUVA	145AP2	0.81	Agriculture
	BHUVA	145BP2	0.02	Agriculture
135	BHUVA	26P80	0.0064	NA
136	BHUVA	26P95	0.0064	NA
137	BHUVA	26P66	0.0067	NA
	BHUVA	26P66	0.8855	NA
138	BHUVA	26P73	0.0064	NA
139	BHUVA	26P67	0.0087	NA
140	BHUVA	26P92	0.0087	NA
141	BHUVA	26P110	0.0064	NA
142	BHUVA	26P113	0.0064	NA
143	BHUVA	26P109	0.0064	NA
144	BHUVA	26P111	0.0064	NA
145	BHUVA	26P112	0.0064	NA
146	BHUVA	26P98	0.0064	NA
147	BHUVA	26P99	0.0064	NA
148	BHUVA	26P17	0.0073	NA
	BHUVA	26P18	0.0073	NA
	BHUVA	26P19	0.0073	NA
149	BHUVA	26P76	0.0064	NA
150	BHUVA	26P78	0.0087	NA
151	BHUVA	26P77	0.0064	NA
152	BHUVA	26P70	0.0064	NA
153	BHUVA	26P72	0.0064	NA
154	BHUVA	26P71	0.0064	NA
155	BHUVA	26P94	0.0105	NA
156	BHUVA	26P90	0.0064	NA
157	BHUVA	26P89	0.0064	NA
158	BHUVA	26P97	0.0087	NA
159	BHUVA	26P65	0.0064	NA
160	BHUVA	26P52	0.0064	NA
	BHUVA	26P53	0.0064	NA
161	BHUVA	26P54	0.0064	NA
	BHUVA	26P55	0.0064	NA
162	BHUVA	26P56	0.0087	NA
	BHUVA	26P57	0.0087	NA
163	BHUVA	26P1	0.0113	NA
164	BHUVA	26P94	0.0064	NA
165	BHUVA	26P100	0.0064	NA
166	BHUVA	26P83	0.8768	NA
	BHUVA	26P84	0.8768	NA
	BHUVA	26P84	0.6481	NA
	BHUVA	26P86	0.6481	NA
167	BHUVA	26P49	0.6481	NA
168	BHUVA	145AP1	1.6	Agriculture
169	BHUVA	88	0.465	NA
170	BHUVA	73P2	0.9506	Agriculture
171	BHUVA	187P1	0.951	Agriculture
	BHUVA	187P2	0.951	Agriculture
172	BHUVA	170	4.8563	Agriculture
173	BHUVA	101	1.8414	Agriculture
174	BHUVA	87	1.4468	Agriculture
175	BHUVA	98	0.8094	Agriculture
176	BHUVA	2	0.1214	Agriculture
177	BHUVA	26	1.2519	NA
178	BHUVA	73P1	0.9615	Agriculture
179	BHUVA	168	1.811	Agriculture
180	BHUVA	12	0.6171	Agriculture

C.2.2. Village Summary Sheet: Village Bhuva

Village: BHUVA; Form: Summary Sheet; Source: Mamlatdar				
Survey number	Land use	Layak area	Kharab area	Total
242p2	canal	0	0.712	0.712
243p2	canal	0	0.024	0.024
244p2	canal	0	0.0216	0.0216
245p2	canal	0	0.1264	0.1264
246p3	canal	0	0.952	0.952
247p2	canal	0	0.024	0.024
247p3	canal	0	0.226	0.226
252p2	canal	0	0.066	0.066
254p3	canal	0	0.206	0.206
257p3	canal	0	0.5904	0.5904
261p3	canal	0	0.26	0.26
		0	3.2084	3.2084
53	grazing land	0.0708	0	0.0708
54	grazing land	0.0708	0	0.0708
		0.1416	0	0.1416
215	habitated land	0.9105	0	0.9105
235	pond	0	2.3067	2.3067
59	graveyard	0.1113	0	0.1113
26	N.A	0	1.2519	1.2519
26p1	N.A	0	0.0113	0.0113
26p100	N.A	0	0.0064	0.0064
26p109	N.A	0	0.0064	0.0064
26p110	N.A	0	0.0064	0.0064
26p111	N.A	0	0.0064	0.0064
26p112	N.A	0	0.0064	0.0064
26p113	N.A	0	0.0064	0.0064
26p17	N.A	0	0.0073	0.0073
26p18	N.A	0	0.0073	0.0073
26p19	N.A	0	0.0073	0.0073
26p49	N.A	0	0.6481	0.6481
26p52	N.A	0	0.0064	0.0064
26p53	N.A	0	0.0064	0.0064
26p54	N.A	0	0.0064	0.0064
26p55	N.A	0	0.0064	0.0064
26p56	N.A	0	0.0087	0.0087
26p57	N.A	0	0.0087	0.0087
26p65	N.A	0	0.0064	0.0064
26p66	N.A	0	0.8855	0.8855
26p66	N.A	0	0.8855	0.8855
26p67	N.A	0	0.0087	0.0087
26p70	N.A	0	0.0064	0.0064
26p71	N.A	0	0.0064	0.0064
26p72	N.A	0	0.0064	0.0064
26p73	N.A	0	0.0064	0.0064
26p76	N.A	0	0.0064	0.0064
26p77	N.A	0	0.0064	0.0064
26p78	N.A	0	0.0087	0.0087
26p80	N.A	0	0.0064	0.0064
26p83	N.A	0	0.8768	0.8768
26p84	N.A	0	0.8768	0.8768
26p85	N.A	0	0.6481	0.6481
26p86	N.A	0	0.6481	0.6481
26p89	N.A	0	0.0064	0.0064
26p90	N.A	0	0.0064	0.0064
26p92	N.A	0	0.0087	0.0087
26p94	N.A	0	0.0105	0.0105
26p94	N.A	0	0.0105	0.0105
26p95	N.A	0	0.0064	0.0064
26p97	N.A	0	0.0087	0.0087
26p98	N.A	0	0.0064	0.0064
26p99	N.A	0	0.0064	0.0064
85p1	N.A	0	0.2952	0.2952
85p2	N.A	0	0.6559	0.6559
88	N.A	0	0.465	0.465
			8.3905	8.3905

C.2.3. Tariz No 1: Village Bhuva

Village: BHUVA; Form: Tariz No. 1; Source: Talati		
Category	Landuse	Area in Ha.
1	Agriculture	326.8838
2	Waste land	2.2064
	Water bodies & river	7.1355
3	Gamtal	5.1596
	Gouchar	0.1416
	Talav	2.3067
	Khadi	0.8286
	Mashan	0
	Graveyard	0.1113
	Krans	2.1685
	Road	1.5671
	Jajru	0
	Ukara	0
4	NA	0
1+2+3+4	Total Area	348.5091
Tariz	Total Area	348.4668
Gazette	Total Area	348.42

C.2.4. Compiled Sheet: Village Bhuva

Villages: Bhuva		
Landuse	Area (Ha)	Source
Agriculture	315.2849	SS and Form 8A
Gamtal	5.1596	Tariz
Gouchar	0.1416	SS & T
Talav	2.3067	SS & T
Graveyard/Mashan	0.1113	SS & T
Ukara	0	
Jajru	0	
Khadi	0.8286	Tariz
Kans	2.1685	Tariz
Nishaj Panchayat	0	
N.A.	8.3905	SS
Residence	6.9744	SS
Commercial	1.4161	SS
Canal	3.2084	SS
Road	1.5671	Tariz
Waste land	2.2064	Tariz
Water Bodies	7.1355	Tariz
Forest	0	
Total	348.5091	Calculated
Total Area (Given)	348.42	Gazette
Total Area (Given)	348.4668	Tariz
SS: Summary Sheet		

C.2.5. Village Land usemap: Village Bhuva

Appendix D. Existing GPCPSIR Land Use Map

S no.	Village Vs Ex Landuse	AGRICULTURE	WASTE LAND	WATER BODIES	ROAD	RAILWAY	PUBLIC SEMIPUBLIC					RESIDENTIAL	INDUSTRIAL		SARDAR SAROVAR REHAB.		NA CONVERSION	Commercial	UTILITIES		FOREST	TOTAL AREA
							Gamtal	Gouchar	Talav	Graveyard	Others		GIDC Estate	other Industries	Agri	Resi			Canal	ONGC wells		
1.	Aragama				2.90				0.90				179.21		168.47							351.48
2.	Akhod	762.78	0.00	12.92	15.62		27.91	22.04	5.06	0.15	3.10						0.06		12.92			862.55
3.	Ambheta												1516.08									1516.08
4.	Amleshwar	1601.37	5.96	135.86	72.38		21.24	52.57	15.27	0.30	4.21				270.12	19.61	1.77		4.84		0.00	2205.51
5.	Atali	941.15	0.82		33.17		6.92	30.23	6.49	3.37	11.28						22.57		25.03	1.70		1082.73
6.	Bhadbhut	471.42	7.29	174.91	1.21		219.23	4.35	10.31	3.95	3.63						13.28					909.57
7.	Bhensali	451.70	30.32	24.12	29.31		4.86	11.09	5.64	2.43	1.20						2.80					563.47
8.	Bhersam	1076.08	8.88	3.09	4.25		7.13	22.30	13.79	0.48	31.62		51.66		145.69	17.51	16.63		35.95			1435.09
9.	Bhuva	306.85	2.21	7.14	1.57		5.16	0.14	2.31	0.11	3.00	6.97					8.39	1.42	3.21			348.47
10.	Dahej	45.70	5143.99		12.33	20.12	23.02	32.50	30.49	2.29	26.13		1100.94						5.14	3.09	661.26	7107.00
11.	Eksal	667.23	0.03	10.14	9.57		5.51	19.43	5.72	0.00	2.53				55.51	7.19	2.98		7.24			793.08
12.	Galenda												564.60							14.58		579.18
13.	Jageshwar												515.04									515.04
14.	Janiadara	421.12			2.17		0.00	1.47	1.79		3.50								14.90			444.95
15.	Jolva												843.51							31.30		874.81
16.	Kaladara	1345.94	289.21	2.73	4.50		17.46	33.37	4.41	0.78	32.20						13.71		11.62			1755.92
17.	Kasva- Samni	710.28	0.03	7.42	23.60		7.27	55.69	5.36	0.05	1.42				31.33		0.26					842.72
18.	Kesrol	458.75	6.14	91.09	2.53		3.86	24.83	6.69	6.54	34.09				126.11	6.95	15.06		6.43			789.06
19.	Khojbal	950.45	153.54	9.89	16.31		10.20	48.06	11.49	1.53	7.57						7.62		5.87			1222.53
20.	Koliad	475.96	438.09		19.87		1.04	28.83	5.77		1.97						1.14			1.48		974.15
21.	Kothia	518.17	39.28	8.21	8.39		5.40	12.82	3.44	0.64	1.65								8.25			606.26
22.	Lakhigam												967.42								94.31	1061.73
23.	Luvara												844.06								51.09	895.15
24.	Mahegam	407.57	136.26		3.91		3.03	4.44	2.22	0.81	2.62											560.85
25.	Manad	465.13	10.04	113.50	14.65		9.28	79.51	19.23		3.07				336.97	10.50						1061.89
26.	Nadarkha	271.69	1.31		6.94		9.75	2.56	3.88		2.61						17.70		17.37			333.80
27.	Nandida	1034.16	0.00		60.72		6.06	37.68	17.78	1.50	35.95								27.40	1.55		1222.80
28.	Navetha	409.16		2.86	16.90		3.82	16.59	3.36	0.60	1.11						2.73		0.85			457.99
29.	Pakhajan	1197.38			10.08		10.35	15.59	11.84	1.87	1.87						0.61		30.18	2.77		1282.54
30.	Pipalia	418.02			9.91		3.14	8.68	4.11	1.47	2.68						0.09					448.10
31.	Rahiad												1418.75							23.17		1441.92
32.	Sadathala	378.78	20.53	4.27	18.02		0.41	8.35	6.58	0.75	7.00						0.06		4.97			449.72
33.	Samatpor	265.09	0.58		7.87		2.47	10.08	0.66		1.13						0.53		4.66			293.06
34.	Sambheti	271.81	0.01		25.09		3.36	5.44	5.24	0.58	4.02								8.37			323.92
35.	Sankhwad	428.82	13.93	29.53	0.13		3.82	14.33	4.04	0.49	0.90						5.08					501.06
36.	Sayakha	1144.20	19.00	283.69	20.42		7.17	32.38	7.82	0.40	51.43						1.21					1567.71
37.	Suva												1431.48							0.10		1431.58
38.	Vadadla												681.03							4.84		685.87
39.	Vadva	258.63	82.15		18.55		4.62	2.71	0.60	3.64	9.81						0.20					380.92
40.	Vahiyal	1698.16		21.96	38.43		11.84	8.43	19.31	0.54	4.74						1.49					1804.90
41.	Vav	403.22	0.54		19.77		6.90	10.97	5.36	0.16									19.49	13.98		480.34
42.	Vengani	268.23	112.06	164.50			5.59	30.75	6.49	4.30	10.55						1.46			4.01		607.94
43.	Vilayat	831.09	40.52	0.00	68.13		14.61	18.66	9.05	4.78	2.61		672.84						12.26			1674.56
44.	Vorasamni	312.98		1.19	16.68		9.29	0.00	4.13	1.55	4.86		190.49				9.43					550.60
	TOTAL	21669.09	6562.71	1109.02	615.87	20.12	481.74	706.86	266.61	46.05	316.05	6.97	10977.11	0.00	1134.20	61.75	146.85	1.42	266.94	102.58	806.66	45298.59

Appendix E. Existing Infrastructure Maps

E.1. Existing Road Infrastructure

E.2. Existing Water Supply Infrastructure

E.3. Existing Effluent Management Infrastructure

E.4. Existing Power Infrastructure

E.5. Existing Irrigation Infrastructure

E.6. Existing Telecommunication Infrastructure

E.7. Existing Gas Supply Infrastructure

Appendix F. Social infrastructure status of available amenities

Table F.1: Social Infrastructure in Villages of GPCPSIR

Taluka	VILLAGE NAME	Education Facilities	Medical facilities	Drinking Water Facilities	Communication (Post, telegraph and Telephone facilities)	Transportation	Bank	Approach to Village	NEAR_TOWN	DIST_TOWN	Power supply
Vagra	Aragama	P(1)	CHW(1)	T, W, HP	PO, Phone (20)	BS	2	PR	BHARUCH	15	EA
Vagra	Vorasam ni	P(2), SS(1)	PHS_CNT (1), CHW(1)	T, W, TK,	PO, Phone (25)	BS	2	PR	BHARUCH	18	EA
Vagra	Vilayat	P(1)	RMP (1), CHW(1)	T, W, TK,	PO, Phone (1)	BS	Comm. Bank	PR, MR, FP	BHARUCH	15	EA
Vagra	Bhersam	P(1)	PHS_CNT (1), FWC (1), RMP (1), CHW(1)	T, W, HP	PO, Phone (10)	BS	0	PR	BHARUCH	15	EA
Vagra	Sayakha	P(1)	PHS_CNT (1), FWC (1), CHW(1)	T, W, TK	PO, Phone (7)	BS	0	PR	BHARUCH	28	EA
Vagra	Kothia	P(1)	CHW(1)	T, W	PO, Phone (3)	BS	0	PR, MR, FP	BHARUCH	30	EA
Vagra	Vahiyat	P(1), SS(1)	PHS_CNT (1), CHW(1)	T, W, TK	PO, Phone (10)	BS, RS	0	PR	BHARUCH	33	EA
Vagra	Pipalia	P(1)	ALL_H (1), CHW(1)	T, W, TK	PO, Phone (8)	BS	0	PR	BHARUCH	35	EA
Vagra	Pakhajan	P(1)	ALL_Disp (1), PHS_CNT (1), FWC (1), CHW(1)	T, TK, HP	PO, TG, Phone (1)	BS, RS	0	PR, MR, FP	BHARUCH	35	EA
Vagra	Nadarkha	P(1)	CHW(1)	T, W, TK	Phone within 5km reach	BS, RS	2	PR	BHARUCH	40	EA
Vagra	Sambhet	P(1)	CHW(1)	T, W, TK	Phone (1)	BS, RS	2	PR	BHARUCH	37	EA

Taluka	VILLAGE NAME	Education Facilities	Medical facilities	Drinking Water Facilities	Communication (Post, telegraph and Telephone facilities)	Transportation	Bank	Approach to Village	NEAR_TOWN	DIST_TOWN	Power supply
i											
Vagra	Janiadara	P(1)	CHW(1)	T, W, TK, HP, CL	PO, Phone (2)	BS, RS	2	PR	BHARUCH	45	EA
Vagra	Akhod	P(1)	ALL_H (1), CHW(1)	T, W, TK,	PO, Phone (10)	BS	2	PR	BHARUCH	32	EA
Vagra	Nandida	P(1)	CHW(1)	T, W, TK, O	PO	BS	2	PR	BHARUCH	40	EA
Vagra	Sadathala	P(1)	CHW(1)	T, W, TK	Phone within 5km reach	BS	2	PR, MR, FP	BHARUCH	46	EA
Vagra	Khojbal	P(1), SS(1)	CHW(1)	T, W, TK	PO, Phone (30)	BS	2	PR	BHARUCH	30	EA
Vagra	Bhensali	P(1)	CHW(1)	T, W, TK	PO, Phone (25)	BS	2	PR	BHARUCH	27	EA
Vagra	Atali	P(1), SS(1)	PHS_CNT (1), FWC (1), RMP (1), CHW(1)	T, W, TK	PO, Phone (15)	BS	Comm. Bank, Coop. Bank	PR, MR	BHARUCH	30	EA
Vagra	Galenda	P(1)	CHW(1)	T, W, TK, HP	PO	BS	2	PR	BHARUCH	37	EA
Vagra	Samatpor	P(1)	CHW(1)	T, W, TK	Phone (1)	BS	2	PR	BHARUCH	39	EA
Vagra	Vav	P(1)	CHW(1)	T, W, TK	Phone >10km reach	BS, RS	2	PR	BHARUCH	45	EA
Vagra	Jolva	P(1)	ALL_H (1), PHS_CNT(1), FWC (1), RMP (1), CHW(1)	T, W, TK	Phoen (10)	BS	2	PR, MR	BHARUCH	42	EA
Vagra	Vadadla	P(1)	MCW (1), CWC (1), PH_CNTR (1), PHS_CNT (1), FWC (1), CHW(1)	T, TK, O	PO, Phone (2)	BS	2	PR	BHARUCH	40	EA
Vagra	Dahej	P(2), SS(1)	ALL_H (1), ALL_Dis (1), MCW (1),	T, TK, HP	PO, TG, Phone (200)	BS, RS, NW	Comm. Bank, Coop.	PR	BHARUCH	45	EA

Taluka	VILLAGE NAME	Education Facilities	Medical facilities	Drinking Water Facilities	Communication (Post, telegraph and Telephone facilities)	Transportation	Bank	Approach to Village	NEAR_TOWN	DIST_TOWN	Power supply
			PH_CNTR (1), PHS_CNT (1), FWC (1), TBC (1), RMP (1), CHW(1)				Bank				
			ALL_H (1), ALL_Disp (1), MCW (1), CWC (1), PHS_CNT(1), RMP (1), CHW(1)	T, W, TK, HP	PO, Phone (28)	BS, NW	2	PR	BHARUCH	39	EA
Vagra	Lakhigam	P(1)	CHW(1)	O	Phone (14)	BS	2	PR, MR, FP	BHARUCH	56	EA
Vagra	Jageswar	P(1), SS(1)	ALL_H (1), RMP(1), CHW(1)	W, TK, HP, R, O	PO, Phone (15)	BS, NW	2	PR	BHARUCH	45	EA
Vagra	Ambheta	P(1)	ALL_H (1), CHW(1)	T,W,TK, HP, R, O	PO, Phone (20)	BS, NW	2	PR	BHARUCH	43	EA
Vagra	Suva	P(1)	CHW(1)	T, W, TK	Phone >10km reach	BS, NW	2	PR, MR, FP	BHARUCH	35	EA
Vagra	Rahiad	P(1)	CHW(1)	W, TK, R	PO	BS, NW	2	PR	BHARUCH	33	EA
Vagra	Koliad	P(1)	CHW(1)	W, R,	Phone >10km reach	BS, NW	2	PR	BHARUCH	33	EA
Vagra	Vengani	P(1)	CHW(1)	W, TK, HP, R	PO	BS, NW	2	PR	BHARUCH	31	EA
Vagra	Kaladara	P(1)	CHW(1)	T, TK, R	Phone >10km reach	BS, NW	2	PR	BHARUCH	31	EA
Bharuch	Amleshwar	P(2), SS(1), AC (1)	ALL_Disp (1), PHS_CNT (1), FWC (1)	T, W, TK, TW, HP,	PO, Phone (3)	BS	2	PR	BHARUCH (INA)	22	EA
Bharuch	Bhuva	P(1), SS(1)	CHW(1)	T, W, TK, TW, HP,	PO, Phone (2)	BS	2	PR	BHARUCH	20	EA
Bharuch	Eksal	P(2), AC (1)	FWC (1), CHW(1)	T, W, TW, HP,	PO, Phone (2)	BS	2	PR	BHARUCH	22	EA
Bharuch	Kesrol	P(2), AC (1)	CHW(1)	W, TK, HP,	PO, Phone (1)	BS	2	PR	BHARUCH	24	EA
Bharuch	Navetha	P(1), AC (1)	MCW (1), CWC (1),	T, W, TK, TW, HP	PO, Phone (6)	BS	2	PR	BHARUCH	20	EA

Taluka	VILLAGE NAME	Education Facilities	Medical facilities	Drinking Water Facilities	Communication (Post, telegraph and Telephone facilities)	Transportation	Bank	Approach to Village	NEAR_TOWN	DIST_TOWN	Power supply
			PH_CNTR (1), PHS_CNT (1), FWC (1), CHW(1)								
Bharuch	Manad	P(2)	CHW(1)	T, W, TK, TW, HP	PO, phone (13)	BS	2	PR	BHARUCH	28	EA
Bharuch	Mahegam	P(1)	CHW(1)	T, W, TK, HP, R,	PO, Phone (5)	BS	2	PR	BHARUCH	32	EA
Bharuch	Bhadbhat	P(1)	ALL_Disp (1), PHS_CNT (1), RMP(1), CHW(1)	T, W, TK,TW, HP,	PO, Phone (25)	BS,	Comm. Bank	PR	BHARUCH	21	EA
Bharuch	Kasva	P(1)	PHS_CNT (1), FWC (1), CHW(1)	T, W, TK, TW, HP	PO, Phone (5)	BS	2	PR	BHARUCH	23	EA
Bharuch	Vadva	P(1)	CHW(1)	T, W, TW, HP,	Phone (5)	BS	2	PR	BHARUCH	17	EA
Bharuch	Sankhva d	P(1)	CHW(1)	T,W, TK, HP	Phone (1)	BS	2	PR	BHARUCH	22	EA

Source: Census Data collected from District Panchayet Office and Primary Census Abstract-2001(CD), Bharuch and Vagra Taluka, Gujarat

List of abbreviations

Educational Institutions	Medical Facilities	Drinking water facilities	Approach to village	Bank	Transportation	Communication
ALL_H – Allopathy Hospital				Comm. Bank – Commercial Bank	BS – Bus Services	PO – Post Office
P – Primary School	ALL_Disp– Allopathy Dispensary	T – Tank	PR – Pucca road	Coop. Bank – Cooperative Bank	RS – Railway Services	TG – Telegraph Office
SS – Secondary School	PHS_CNT – Primary Health Centre	TW – Tube Well	MR – Mud Road			
AC – Adult Literacy Centre	FWC – Family Welfare Centre	HP – Hand Pump	FP – Foot Path			Power Supply
	CHW – Community Health Worker	TK – Tank water				EA – Electric Power for all purpose

Appendix G. List of allotted industries

Table G.1: Allotment detail of Dahej I estate

Name of the Company	Plot No.	Area (in Ha.)	Sector	Products	Subsector	Scale of Industries
Reliance Industries Limited (earlier I.P.C.L.)	1	681.610	Chemical / Petrochemical	1) VCM, PVC, Chlor-Alkali Plant 2) Ethane, Propylene, Butadiene etc (petrochemical complex)	Petrochem	Large
Reliance Dahej Marine Terminal (RDMT) – Jageshwar Jetty	NA	NA	Chemical / Petrochemical	Container terminal and captive jetty of Reliance Industries Limited (IPCL)	Logistics	Large
Gujarat Alkalis and Chemicals Limited	3, CH-17	140.950	Chemical / Petrochemical	Caustic Soda (lye, flakes, prills), Sodium hypochloride, liquid chlorine, compressed hydrogen gas, HCL, caustic Potash (lyes, flakes), Potassium carbonate, Polyaluminum Chloride, Phosphoric Acid, Hydrogen peroxide, Aluminum Chloride anhydrous etc.	Inorganic chem	Large
Oil and Natural Gas Corporation Limited	7/D	55.000	Petroleum	Petroleum, Oil refining	Petrochem	Large
L.G. Polymer	12/B	26.000	Chemical / Petrochemical	Polystyrene, expandable polystyrene (EPS), ABS (acrylonitrile-butadiene-styrene) and SAN (styrene acrylonitrile).	Polymer	Large
NOCIL	12/A/1, 13/B/1	20.450	Chemical / Petrochemical	Rubber chemical	elastomer	Large
Sterling Auxiliaries	12/A/2	11.190	Chemical / Petrochemical	Fatty Alcohols, Fatty Acids, Alkyl Phenol, Fatty Amines, Esters, Stearic Acid Ethoxylates, Ethoxylates of Other Vegetable Oils – Castor oil, Phenoxyl Ethanol, Sulphanated Products Emulwet – BUT, HPWD –A1, Esters, Amides & Betains, Phosphatized and Anti-oxidants products	Specialty Chemicals	Large
Gujarat Florochem. Ltd.	12/A	41.050	Chemical / Petrochemical	PTFE- PT-PTFE & TFE, Chloro Methane, Caustic Soda	Inorganic chemicals, Polymer	Large
The Sarashwati Industries	13/B	19.720	NA	NA	NA	NA

Name of the Company	Plot No.	Area (in Ha.)	Sector	Products	Subsector	Scale of Industries
Mahipal Chemical	E/532	0.120	Chemical / Petrochemical	NA	Chemical	Medium
Chloride India	E/533, 534	0.223	Chemical / Petrochemical	Calcium Chloride, Ammonium Chloride concentrate	Inorganic chemical	Medium
Meghmani Organics Ltd.	CH 1, 2	65.000	Chemical / Petrochemical	Caustic Soda Lye and Flacks, Chlorine Gas, Hydrogen Gas, 78% Dilute Sulphuric Acid, 30% HCL, Sodium Hydrochlorite	inorganic chem	Large
Jash Chem	Ch-3	1.000	Chemical / Petrochemical	NA	NA	NA
Borex Morarji Ltd.	CH-4	9.010		NA	NA	NA
Hemani Intermediates Pvt. Ltd.	CH-5	4.000	Chemical / Petrochemical	NA	fine chemicals	Medium
Universal Chem Ind.	CH-5/A (CH-5D)	9.350	Chemical / Petrochemical	KMnO ₄ , KOH	inorganic chem	Medium
Luna Chem Ind Ltd.	CH-6,7,8,9	6.894	Chemical / Petrochemical	Aniline oil, Nitro Aromatics, Nitro Benzene	specialty chem	Large
Expanded Incorporation (Expanded Polymer Systems P. Ltd.,)	CH-10	5.000	Chemical / Petrochemical	NA	polymer	Medium
Alex Industries	CH-11	1.100	NA	NA	NA	NA
Agrasen Impex Private limited (Sajjan Ind. Ltd)	CH-12	16.000	NA	NA	NA	NA
Indocat Pvt Ltd	CH-15	10.500	Chemical / Petrochemical	Manufacturing & marketing of FCC (fluidised catalytic cracking) catalysts and additives.	specialty chem	Large
Vishal Organics	CH-18&19	2.500	NA	NA	NA	Medium
Insecticides (India)Limited	CH-21	15.000	Chemical / Petrochemical	NA	fine chem	Large
Stephan (India) Pvt. Ltd (Surfactant Project)	CH-23	20.000	Chemical / Petrochemical	Surfactants and specialities which include anionics, non-anionics cationics and amphoterics	specialty chem	Medium
Astral Biochem Pvt. Ltd	CH-25	6.421	Chemical / Petrochemical	Ethanol	chemical	Medium
Siris Crop Sciences Ltd.	CH-44/1	11.403	Chemical / Petrochemical	NA	fine chemicals	Large
BASF Styrenics Ltd. (Earlier Pushpa Polymers)	H-6/1 (4)	0.240	Chemical / Petrochemical	Polymers of Styrene	petrochem	Large
Ganesh Oleo Chem Limited	S/120	1.000	Chemical / Petrochemical	NA	specialty chemicals	Medium
Organic Industries Ltd. (M/s Surfactant Specialities Ltd.)	S/163	17.158	Chemical / Petrochemical	Potassium Permanganate, Boric Acid Powder	Specialty Chemicals	Medium
Metro Pharma Chem Mfg Co.	S-165	1.000	Chemical / Petrochemical		Fine Chemicals	Medium

Name of the Company	Plot No.	Area (in Ha.)	Sector	Products	Subsector	Scale of Industries
Hindalco (Indo Gulf)	2, 10,11,43	356.350	Engineering	Copper Cathodes, Power, Oxygen, Sulphuric acid etc.	Metallurgical	Large
Sitaram Energy & Logistics limited	E-206, E-207	1.523	Engineering	Packing of DAP/NPK fertilisers for Birla Copper	Logistics	Medium
Standard Engineering (Enterprise)	E/339	0.239	Engineering	Motor Winding	Electrical	Medium
Snehal Engineering	S/125	0.085	Engineering	NA	Not defined	NA
Birla AT&T Communication Ltd.	S-11	0.059	Engineering	NA	Communication	Medium
Shiv Engineering	S-12 & 13	0.232	Engineering	NA	NA	NA
Shiv Engineering	S/15	0.230	Engineering	NA	NA	NA
Swami Steel	S/136	0.350	Engineering	NA	NA	NA
Blast Abrasives Processing Ind. (M/s. Jolly Abrasives)	S/153	2.191	Engineering	NA	NA	NA
Deepthy Engineering Works	S/155	0.480	Engineering	NA	NA	NA
Narmada Packaging	S/164	0.670	Engineering	NA	Packaging	Medium
Varun Engineering	S-52/1	0.085	Engineering	NA	NA	Medium
ISGEC	NA	NA	Engineering	High pressure vessels, Boilers, Heat exchangers	NA	Large
Walchandnagar Industries Ltd.		NA	Engineering	Developing an offshore platform fabrication	NA	Large
Petronet LNG Ltd.	CH-14, 7/A/1	82.500	Natural Gas Infrastructure	Import of LNG, Regassification of LNG & Export of Natural Gas etc.	Gas Infra	Large
Petronet LNG & M/s GSPC Gas Company Ltd.	CH-14 7/A/1	NA	NA	Import of LNG regasification	Gas Infra	Large
IOC Ltd. – Terminal	7/A	NA	NA	NA	Logistics	Large
GCPTCL	8	150.000	Chemical handling port	Commercial port and storage terminal for dedicated for handling Liquid & Gaseous Chemicals	Logistics	Large
GSPL	8/- 1	0.901	Natural Gas Infrastructure	Developing natural gas transportation for Dahej-Vijaipur Pipeline network	Gas Infra	Large
GEB	31	14.233	Electricity Board	NA	power infra	
A.B.G. Shipyard	RS. No. 701/A,B and 39 + 40/1&2	17.990	Port and related Industries	NA	NA	Large

Name of the Company	Plot No.	Area (in Ha.)	Sector	Products	Subsector	Scale of Industries
GMB – site for Ro-Ro Terminal	NA	NA	Port	NA	NA	Large
Adani Petronet (Dahej) Port P. Ltd.	NA	NA	Port and related Industries	NA	port	Large
Telephone Exchange	S/65 to 67	0.546	Others	NA	NA	NA
Y.A. Matadhar	S/81	0.118	Others	NA	NA	NA
B.K. Solanki	RS. No. 225/B	1.221	Others	NA	NA	NA
Smt. Vimalaben K. Patel	E/340	0.180	Others	NA	NA	NA
D.M. Chaudhury	E/531	0.120	Others	NA	NA	NA
Disaster Management	23/-1	0.100		NA	NA	NA
M/s. Vijaykumar Nandlal Upadhyay (Hotel Shalin)	S-13 & 14	0.300	Others	NA	NA	NA
Smt. Sangeetaben J. Tapiawala	S/18	0.210	Others	NA	NA	NA
Shri Rajesh R. Tapiawala	S/55	0.750	Others	NA	NA	NA
Shri S.B. Kulchandani	S/31 (S-131)	0.320	Others	NA	NA	NA
Smt. Vanitaben Yogeshbhai Shah	S/113	0.250	Others	NA	NA	NA
Dahej Police Station	S/117	0.098	Others	NA	NA	NA
M/s. Deep Enterprise	S/156	0.270	NA	NA	NA	NA
M/s Raj Enterprise	S/157	0.475	NA	NA	NA	NA
M/s Aashish and Co.	S/158	0.530	NA	NA	NA	NA
M/s. Narmada Industries	S/159	0.890	NA	NA	NA	NA
Smt. Priti Tarak Mamlatdama	S/1	0.900	NA	NA	NA	NA
M/s Aarav Enterprise	S/51	0.830	NA	NA	NA	NA
Shri Y V Modi	S-236	0.890	NA	NA	NA	NA
GIDC Office	NA	NA	NA	NA	NA	NA

Table G.2: Allotment detail of Dahej SEZ

Name of the Company	Plot No.	Area (sq.mt)	Area in Ha.	Sector / Products	Present Status	Subsector	Scale of Industries
ONGC Petro Additions Ltd.	Z-1	50530047.000	526.00	Petrochemical	Under Construction		

Name of the Company	Plot No.	Area (sq.mt)	Area in Ha.	Sector / Products	Present Status	Subsector	Scale of Industries
ONGC Petro Additions Ltd.	Z-83			Petrochemical	Under Construction		Large
ONGC Petro Additions Ltd. (C2-C3-C4 project)	Z-7/D (Z/7)	598574.000	230.000	Petrochemical	Under Construction		
DIC Fine Chemicals Private Ltd.	Z-3	20000.000	2.000	Petro chemical	Under Construction	chem	medium
M/s.Pidilite Industries Limited	Z-2	204135.000	20.414	Petrochemical - Synthetic Elastomer	Under Construction	specialty	Large
M/s. Neesa Infrastructure India Pvt Ltd.	Z-88	140648.000	14.065	Petro chemical	Proposed Site	infra	
M/s. Chemetall Lithium India P. Ltd.	Z/12/2	17900.000	1.790	Chemical / petrochemical - inorganic, organic, hydrides, alkoxides, amides etc.	NA	chem	Medium
M/s. Indofil Chemicals Co.	Z-8, Z/7/1	98700.000	9.870	Petrochemical	Operational	chem	Large
M/s. Firmenish Aromatics Prod. (I) Ltd.	Z-10	197300.000	19.730	Petrochemical	Under Construction		Medium
M/s. Sarju Impex Ltd.	Z-13	24878.000	2.488	Petrochemical	Under Construction	textile	Large
M/s. Prasar Chem Pvt. Ltd. (M/s Aries Colorchem Pvt. Ltd.)	Z/29 & Z/30	32200.000	3.220	Petrochemical	Proposed Site	chem	Medium
M/s James Robinson India Pvt. Ltd.	Z/33	20058.000	2.006	Chemical / petrochemical - specialty chemicals and Intermediates like photography chemicals, hair dyes intermediates, fluorescent pigments	NA	specialty	Medium
M/s. Meghmani Chemtech Ltd.	Z/31 & Z/32	84428.000	8.443	Chemical / petrochemical	Proposed Site		Large
M/s. Meghmani Speciality Chemical Ltd.	Z-6	75415.000	7.542	Chemical / petrochemical	Proposed Site	Fine Chemicals	Large
M/s Meghmani Unichem Pvt. Ltd.	Z/34	53831.000	5.383	Chemical / petrochemical	Proposed Site	Fine Chemicals	medium
Sun Pharmaceutical Ind Ltd.	Z/15	87480.000	8.748	Chemical / petrochemical	NA	Fine Chemicals	Large
M/s.Sigachi Cellulos Pvt Ltd.	Z-16	10822.000	1.082	Chemical / petrochemical - Heavy Chemicals, Cellulose and Chlorine based products	Proposed Site	Speciality Chemicals	Large
M/s.Gujarat Dyestuff Industries	Z-25, 26, 27 &	76689.000	7.669	Chemical / petrochemical	Proposed Site	Fine Chemicals	Large

Name of the Company	Plot No.	Area (sq.mt)	Area in Ha.	Sector / Products	Present Status	Subsector	Scale of Industries
28							
M/s.P&J Cretechem (P) Ltd.	Z-17 & 18	20695.000	2.070	Chemical / petrochemical - Construction Chemical & Intermediates	Proposed Site	Speciality Chemicals	Medium
Ramdev Chemicals Industry	Z/19, Z/20	20000.000	2.000	Petrochemical	NA	NA	NA
M/s.Chemorge (Jain).	Z-22	9375.000	0.938	Chemical	Proposed Site	NA	NA
M/s. Panama Petrochem Ltd.	Z-23	9375.000	0.938	Chemical / Petrochemical - Petroleum speciality	Proposed Site	Speciality Chemicals	Medium
M/s. Sajjan Speciality Ltd.	Z-106	89505.000	8.951	Petrochemical	Proposed Site	Fine Chemicals	Medium
M/s. Rallis India Ltd.	Z-110	80004.000	8.000	Petrochemical	Proposed Site	Fine Chemicals	Large
M/s. P.I.Industries Ltd.	Z-97/P	NA	NA	Chemical / petrochemical	Proposed Site	Speciality Chemicals	Large
M/s. Borregaard Kelkar Chemicals Pvt Ltd.	Z-109/B	NA	NA	Chemical / petrochemical	Proposed Site	NA	NA
M/s.Sun Pharmaceutical Industries Ltd.	Z-105	NA	NA	Petrochemical	Proposed Site	Fine Chemicals	Large
M/s.Bajaj Eco-Chem Products Pvt Ltd.	Z-108	NA	NA	Chemical / petrochemical	Proposed Site		Medium
M/s. Bajaj Hindustan Limited	Z-107	NA	NA	Chemical / Petrochemical - Sugar and Ethanol Manufacturing Company	Proposed Site	Chemicals	Large
M/s. Choksi Colours Pvt.Ltd.	Z-109/A	NA	NA	Petrochemical	Proposed Site	Fine Chemicals	Medium
M/s Torrent Pharmaceutical Ltd.	Z/104, Z/105	164400.000	16.440	Petrochemical	NA	Fine Chemicals	Large
Aetgen Pharma Pvt. Ltd.	Z/101/2	50000.000	5.000	Petrochemical	NA	Fine Chemicals	Large
Sterling Auxiliaries Pvt. Ltd.	Z/109	50100.000	5.010	Chemical / Petrochemical	NA	Speciality Chemicals	Medium
M/s. Shankar Packaging Ltd.	Z-12	50000.000	5.000	Engineering - others	Proposed Site	Packaging	Medium
M/s. Torrent Energy Ltd.,	Z-9	1107158.000	110.716	Power	Proposed Site		Large
M/s. Torrent Energy Ltd.,	Z/21, Z/101/1	65434.000	6.543	Power	NA		Large
M/s.Roxul-Rockwool Insulation India Pvt Ltd.	Z-111/B (Z/4/1)	94163.000	9.416	Stone wool insulation	Proposed Site	Ceramic	Large
M/s Godrej & Boyee Mfg.Co.Ltd.	Z-90	235030.000	23.503	Engineering	Proposed Site		Large
M/s.Saraswati Industrial Syndicate Ltd.	Z-89	238020.000	23.802	Engineering - manufactures bars & rods, metal, machine tool parts &	Proposed Site		Medium

Name of the Company	Plot No.	Area (sq.mt)	Area in Ha.	Sector / Products	Present Status	Subsector	Scale of Industries
				accessories, steel and sugar products.			
Tiong Woon Project and Contracting Pte. Ltd.	Z/88 (P/3)	10000.000	1.000	Engineering - specialists and solution providers of infrastructure businesses, supporting mainly the Oil & Gas, as well as Petrochemical, Power and Construction sectors - providing possesses heavy lift, heavy haulage, marine transport and fabrication yard resources	NA	Logistics	Large

Table G.3: Allotment detail of Dahej II

Name of the Company	Plot No.	Area (Ha.)	Sector	Product	Present Status	Subsector	Scale of Industries
Growmore Enterprises	NA	NA	Chemical	Sodium Silicate, Ceramics Frit	Operational	Ceramics	Medium
Nahar Paints & Chemicals Limited	NA	NA	Chemical	Ceramic Tile Glaze	Operational	Speciality Chemicals	Medium
GNFC – TDI-Aniline Complex	D-II/8	279.72	Chemical / Petrochemical	TDI, MDI and related product	Under Construction	Speciality Chemicals	Large
First Carbon Technologies Private Limited	D-II/4, D-II/12, D-II/12/A, D-II/13	100.04	Chemical	Project of Cokonyx produced by Carbon Alloys Synthesis Plant	Under Construction	metal	Large
M/s Action Peroxide Pvt.Limited	D-II/7A	32	Chemical	Caustic soda, Chlorine gas and Hydrochloric acid	NA	Inorganic Chemicals	Large
Gujarat Alkalies and Chemicals Limited	D-II/6	113.83	Chemical / Petrochemical	Project of Phenol, Bis phenol-A, Poly carbonate, Elastomer group products EDC/PVC	NA	NA	Large
M/s. SRF Limited,	D-II/1	45.9933	Chemical / Petrochemical	Polymer, Monomer, refrigerant gases, trichloroethylene and perchloroethylene, caustic / chlorine	NA	NA	Large
M/s GACL	D-II/9	65.7095	Chemical / Petrochemical	Caustic Soda, Chlorine, hydrogen, Hydrochloric Acid, Sodium Hypochlorite and other products based on chlorine and hydrogen and power for above plants	NA	Inorganic Chemicals	Large

Name of the Company	Plot No.	Area (Ha.)	Sector	Product	Present Status	Subsector	Scale of Industries
M/s GSFC	D-II	225	Chemical / Petrochemical	MMA/PMA complex biodegradable plastics derivatives caprolactone nylon fibre complete offside facilities	NA	Polymer	Large
Kaneria Granito	NA	NA	Others	Vitrified tiles	Operational	Ceramics	Large
Pavit Ceramics	NA	NA	Others	Paving/Exterior Tiles	Operational	Ceramics	Large
Shiv Shakti Industries	NA	NA		NA	Operational		
Daya Glass India Private Limited	NA	NA	Others	Ceramic Industry	Not in operation since last 20 days	Ceramics	Medium
Welspun Stahl Rohren Gujarat Limited	NA	NA	Engineering	Saw Pipes, Plates and Coils	Operational	NA	Large
M/s. Adani Power Dahej Limited	D-II/2, D-II/5	211.6076	Engineering	Generation of Electricity	NA	Power	Large
M/s. Bharat Forge Limited	D-II/11	66.61	Engineering	Castings, Heavy forgings, Turbine and generator for power plants, balance of plants, nuclear power plants equipment other capital goods	NA	NA	Large

Table G.4: Allotment detail of Vilayet Estate

Name of the Company	Plot No.	Present Status	Area (in Ha.)	Sector	Subsector	Scale of Industries
M/s Grasim Industries	1	Proposed Site	222.63	Petrochemical	Textile	Large
M/s. Biotor Industries Ltd. (formerly Jayant Oil & Derivatives Ltd.)	2	Proposed Site	122	Agrochemical	Fine Chemicals	Large
M/s Century Pulp and Paper	3	Proposed Site	100	Chemical / petrochemical	Chemicals	Large
M/s. Colourtex Ind. Pvt. Ltd., Surat	3/A	Proposed Site	40	Chemical / petrochemical	Fine Chemicals	Large
M/s Jubilant Organosys Limited	4	Proposed Site	20.23	Chemical / petrochemical	Specialty	Large
M/s Jubilant Infra. Pvt. Limited	5	Proposed Site	107.24	Chemical / petrochemical	Fine Chemicals	Large
M/s. Gujarat Hydrocarbon and Energy SEZ Limited, C/o. M/s Assam Company Limited	6	Proposed Site	315	Petrochemical	NA	Large
M/s. Indra Steel Pvt. Ltd.	E/56	Proposed Site	0.5004	Engineering	Metallurgical	Large
M/s. Anupama Saigal	E/58	Proposed Site	0.5004	Others	NA	NA
Shri Shashi Kapoor	E/54	Proposed Site	0.5004	others	NA	NA

Name of the Company	Plot No.	Present Status	Area (in Ha.)	Sector	Subsector	Scale of Industries
NareshKumar Khanna	E/55	NA	0.5004	others	NA	NA
M/s. Dinesh Enteerprise	E/52	NA	0.5004	others	NA	NA
Shushma Agrawal	E/53	NA	0.5004	others	NA	NA
Ritu Jain	E/48	NA	0.5004	others	NA	NA
Sukhmal Jain	E/50	NA	0.5004	others	NA	NA
Smt. Hamal Preet Honey	E/41	NA	0.5004	others	NA	NA
Rakeshkumar	E/42	NA	0.5004	others	NA	NA
Mardul R. Jjain	E/43	NA	0.5004	others	NA	NA
Tarun Jain	E/44	NA	0.5004	others	NA	NA
Shri Shiv Enterprise	E/45	NA	0.5004	others	NA	NA
Amit Rakesh Jain	E/46	NA	0.5004	others	NA	NA
Trishla D. Jain	E/47	NA	0.5004	others	NA	NA
Ritu Jain	E/48	NA	0.5004	others	NA	NA
Sukhmal Jain	E/50	NA	0.5004	others	NA	NA
AIK Packaging	E/50	NA	0.5004	others	NA	NA
Dinesh Enterprise	E/52	NA	0.5004	others	NA	NA
Shushma Agraval	E/53	NA	0.5004	others	NA	NA
M/s. Sapana Gupta	E/8	NA	0.4989	others	NA	NA
Gurudatt R Juneja	E/9	NA	0.96	others	NA	NA
Vijaykumar R. Bhavatia	E/10	NA	0.96	others	NA	NA
Chandreshkumar Behal	E/11	NA	0.96	others	NA	NA
Shital M. Sachde	E/12	NA	1.18	others	NA	NA
Heenaben R. Keshwani	E/13	NA	1.05	others	NA	NA
Sarojben Bhupandra Kapadia	E/15	NA	0.96	others	NA	NA
Abhinav Industrial	E/16	NA	0.96	others	NA	NA
Jahida Jain Patel	E/17	NA	0.96	others	NA	NA
Chandrajit Singh Vadatia	E/18	NA	0.96	others	NA	NA
Harshad P. Patel	E/19	NA	0.96	others	NA	NA

Appendix H. Infrastructure Matrix of Industrial Survey

Table H.1: Industry Survey Sheet

UNITS UNDER OPERATION	Direct Employee	Pre-Production & Production									Post-production							Common Services					Social Infrastructure						
		Raw material movement				Availability of other industrial infrastructure					Material Despatch				Availability of other industrial infrastructure			R & D Centres	Quality certification	ICT infrastructure	Marketing infrastructure	Truck Parking Bay	Housing	Healthcare	Recreation and sports	Hotels	School/College	Post Office	Banks
		Road	Port	Rail	Pipeline	Power	Water		Fuel		Storing		Road	Port	Rail	Pipeline	Sewage Disposal												
BASF Styrenics Private Limited	95	Y	Y	N	N	DGVC L	GIDC	Furnace Oil		Styrene tank	Y	N	N	N	Zero Disposal	NA	Process Waste & ETP sludge to BEIL and Carboise & Spent oil to resale	N	Y	Y	Y	N	N	Y	N	N	N	N	N
Gujarat Alkalies & Chemicals Limited	700	Y	Y	N	N	Captive plant	GIDC	NG		Open yard and Godown	N	Y	N	N	Into Sea(7 km inside the sea)	Into Sea(7 km inside the sea)	BEIL and Recyclers & reproprocessors	N	Y	Y	Y	Y	Y	Y	Y	N	N	N	N
Meghmani Finechem Ltd.	300	Y	N	N	N	Captive plant	GIDC	Coal		open yard Tank and Open yard	Y	N	N	N	Septic tank	CET P	To pit and sale to uthorized vendor	Y	Y	Y	Y	Y	N	Y	N	N	N	N	N
Chlorides India	16	Y	N	N	N	DGVC L	GIDC	Firewood			Y	N	N	N	Septic tank		BIL	N	N	N	N	Y	N	N	N	N	N	N	Y
Sitaram Energy & Logistics Ltd.	25	Y	N	N	N	DGVC L	GIDC	NA			Y	N	N	N	Septic tank	NA	NA	N	N	N	N	N	N	N	N	N	N	N	N
Standard Enterprise	18	Y	N	N	N	DGVC L	Private Tanker	NA		iron racks	Y	N	N	N	Septic tank		Resale	N	N	Y	Y	NA	Y	Y	N	N	N	N	N

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UNITS UNDER OPERATION	Direct Employee	Pre-Production & Production								Post-production							Common Services					Social Infrastructure						
		Raw material movement				Availability of other industrial infrastructure				Material Despatch				Availability of other industrial infrastructure			R & D Centres	Quality certification	ICT infrastructure	Marketing infrastructure	Truck Parking Bay	Housing	Healthcare	Recreation and sports	Hotels	School/College	Post Office	Banks
		Road	Port	Rail	Pipeline	Power	Water	Fuel	Storing	Road	Port	Rail	Pipeline	Sewage Disposal	Effluent Disposal	Solid Waste												
Hindalco Industries Limited	2500	N	N	N	N	Captive plant	GIDC	FO,Naptha,Propane		N	N	N	N				N	Y	Y	Y	Y	N	N	N	N	N	N	N
Organic Industries Limited	135	Y	N	N	N	DGVC L	GIDC		tanks	Y	N	N	N	Zero Discharge Unit			N	Y	Y	Y	Y	N	Y	N	N	N	N	N
Petronet LNG Limited	180	N	Y	N	N	DGVC L	GIDC			N	N	N	Y	Sea disposal		sell to recyclers and BMC	N	Y	Y	Y	N	N	Y	Y	N	N	N	N
Indofil Chemicals Company	98	Y	Y	N	N	Torrent Power	GIDC	Coal & LDO	tanks	Y	Y	N	N	Septic Tank	Sea	BEIL,Approved recycler	N	N	Y	Y	Y	N	Y	N	N	N	N	N
Luna Chemical Inds. P. Ltd.	50	Y	N	N	Y	DGVC L	GIDC	HSD & FO	Not available	Y	N	N	N	Septic tank	CET P	resale	N	Y	Y	Y	Y	N	Y	N	N	N	N	N
ONGC – Gas Gathering Station	10	N	N	N	Y	Captive plant	Gandhar WTP	NA	tanks	N	N	N	Y	Septic tank			N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Shoft Shipyard Private Limited	250	Y	N	N	Y	DGVC L	Private tankers		open yard	N	Y	N	N	Sea disposal		Sell for reprocessing	N	Y	Y	Y	Y	Y	Y	N	N	N	N	N
Pavit Ceramics Pvt. Ltd.	60	Y	N	N	N	DGVC L + Captive plant	Private tankers		Bags in Godown	Y	N	N	N	Septic tank		Resale & Reuse	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N
Welspun Gujarat Stahl Rohren Ltd.	500	Y	Y	N	N	DGVC L + Captive plant	GIDC	HFO, HSD,NG for Power & NG for heating	Open yard	Y	Y	N	N	Root zone type		Surat,BEIL & Resale	Y	Y	Y	Y	Y	N	N	N	N	N	N	N
GCPTCL	90		Y		Y		GIDC	HSD		Y	N	N	Y	Septic tank		Sell for reprocessing	Y	Y	Y	Y	Y	N	Y	N	N	N	N	N

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UNITS UNDER OPERATION	Direct Employee	Pre-Production & Production								Post-production							Common Services					Social Infrastructure						
		Raw material movement				Availability of other industrial infrastructure				Material Despatch				Availability of other industrial infrastructure			R & D Centres	Quality certification	ICT infrastructure	Marketing infrastructure	Truck Parking Bay	Housing	Healthcare	Recreation and sports	Hotels	School/College	Post Office	Banks
		Road	Port	Rail	Pipeline	Power	Water	Fuel	Storing	Road	Port	Rail	Pipeline	Sewage Disposal	Effluent Disposal	Solid Waste												
Grow More / Narmada / Jayson Enterprise (A Group of Kaneria Group of Industries)	25	N	N	N	N	DGVC L	Private tankers	NG	solid and open yard	N	N	N	N	Disposed to open space & septic tank	Sell for reprocessing	N	Y	N	Y	N	Y	N	N	N	N	N	N	
Gujarat Fluoro Chemicals Limited		Y	N	N	N	DGVC L + Captive plant	GIDC	Imported coal(250 MTD) & NG(0.19 MMSCMD)	Open yard and tanker	Y	Y	N	N	Septic tank	Sea	BEIL,GEPIL,Cement Industry & Recycler	Y	Y	Y	Y	Y	N	N	N	N	N	N	
ISGEC	300	Y	Y	N	N	DGVC L	GFCL	LPG & HSD	open yard and closed godowns	Y	Y	N	N	Septic tank	Resale	N	Y	Y	Y	Y	N	N	N	N	N	N	N	
Nahar Colours & Coating Ltd.	60	Y	Y	N	N	Captive plant	Private tankers		Bags in Godown	Y	N	N	N	Septic tank	Resale & Reuse	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	
Sterling Auxiliaries Pvt. Ltd.	98	Y	Y	N	N	DGVC I	GIDC	LDO & FO		Y	Y	N	N	Septic tank	Sea	BEI & sell to authorized vendor	Y	Y	Y	Y	N	Y	Y	N	N	N	N	
Kaneria Granito Limited	350	Y	N	N	N	DGVC L	Private tankers	NG	Open yard and warehouse	Y	N	N	N	Disposed to open space & septic tank	Sell torecyclers	Y	Y	Y	Y	N	N	N	N	N	N	N	N	
Universal Chemicals & Industries Pvt. Ltd.	150	Y	N	N	N	DGVC L	GIDC	NG	Godown and storage tank	Y	N	N	N	Septic tank	Sell to recyclers	Y	Y	Y	Y	N	N	N	N	N	N	N	N	

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UNITS UNDER OPERATION	Direct Employee	Raw material movement		Pre-Production & Production						Material Despatch				Post-production			Common Services					Social Infrastructure						
				Availability of other industrial infrastructure										Availability of other industrial infrastructure			R & D Centres	Quality certification	ICT infrastructure	Marketing infrastructure	Truck Parking Bay	Housing	Healthcare	Recreation and sports	Hotels	School/College	Post Office	Banks
		Road	Port	Rail	Pipeline	Power	Water	Fuel	Storing	Road	Port	Rail	Pipeline	Sewage Disposal	Effluent Disposal	Solid Waste												
Jolly Abrasives	15	N	N	N	Y	DGVC L	Private tankers		Tanks	Y	N	N	N	Septic tank			N	Y	Y	Y	Y	N	N	N	N	N	N	N
Eurostar Crystal Marble	30	Y	N	N	N	DGVC L	Private tankers		Open yard and tank	Y	Y	N	N	Septic tank			N	N	Y	N	N	N	N	N	N	N	N	N
Reliance Industries limited	1600	Y	N	Y	N	GETCO	Captive Facility	NG,Cracker off gas,Mixed slop oil		Y	Y	N	N	Mixed with Effluent	Sea	Landfill site,Incineration and Sell to vendor	Y	Y	Y	Y	Y	N	Y	N	N	N	N	Y
ABG Shipyard Ltd.	700	N	N	N	Y	DGVC L	Private tankers	HSD	Open yard and sphere	Y	N	N	N	Septic tank			Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N
Daya Glass Industries Pvt. Ltd.	93	N	N	N	N		Private tankers	NG & HSD		N	N	N	N	Septic tank			N	Y		Y		N	N	N	N	N	N	N
ONGC Petro additions Ltd.(OPaL)	650	Y	Y	Y	Y	Torrent Power and Captive Facility	Captive Facility			Y	Y	Y	Y	STP	CETP		N	Y	Y	Y	Y	Y	Y	N	N	N	N	N

Appendix I. Contact list & Stakeholder consultation record

I.1. Contact List

CONTACT LIST

Sl. No.	Organisation	Address	Contact Person / Designation	Landline / Mobile Phone nos	Email	Website
AHMEDABAD						
1.	Airport Authority of India,		Mr. Hota, DGM (ATC)	91-9426364198		
2	Airport Authority of India, Ahmedabad		Suresh Datt Awasthi, Airport Director, AAI, S.V.P. International Airport,	079-2286-9211/7261		
3.	Airport Authority of India, Ahmedabad		Mr. A.K. Verma	91-9327073839		
4			Mr. Vaibhab Shah, Ass. Exec (C&O), CONCOR	91-9824754017		
5	CEPT, Anchor Institute of Technology	Kasturbhai Lalbhai Campus, University Road, Navrangpura, Ahmedabad-380009	Prof. Dr. A.K.A.Rathi, Faculty of Planning and Public Policy	079-26302470, 26302075, 91-9825725078, 079-29096984 (O)	drakarathi@cept.ac.in, drakarathi@gmail.in	www.cept.ac.in
			Dr. SS Rao (Srigiriraju Srihari Rao)	91-9825143747	ssrao1742@gmail.com	
6	Meteorological Department					
7	CGWB					
8	AUDA					
GANDHINAGAR						
1	Gujarat Industrial Development Corporation (GIDC)		Mr. Rajagopalan, Chairman	079-23250703, 91-9825095130		http://www.gidc.gov.in/
2	Gujarat Industrial Development Corporation (GIDC)		Mr. Pujari, Vice Chairman & Managing Director	079-23250583, 91-9879110001		http://www.gidc.gov.in/
3	Gujarat Industrial Development Corporation (GIDC)	3rd floor, Block no. 4, Udyog Bhawan, Sector 11, Gandhinagar - 382017	Mr. Nayan Raval, General Manager (Projects)	079-23250705, 91-9879110005	nayanravalgidc@yahoo.com	http://www.gidc.gov.in/
4	Gujarat Industrial Development Corporation (GIDC)		Mr. Neerav Mahadevia, Architect Planner ,GIDC	91-9879110033		http://www.gidc.gov.in/
5	Gujarat Industrial Development Corporation (GIDC)	4th floor, Block no. 4, Udyog Bhawan, Sector 11, Gandhinagar - 382017	Mr. Ashok Nakun, GPCPIR Project Officer	91-9898474800	ashok_b_nakun@yahoo.com	http://www.gidc.gov.in/
6	Gujarat Industrial Development Corporation (GIDC)	4th floor, Block no. 4, Udyog Bhawan, Sector 11, Gandhinagar - 382017	Mr. Diwakar Sharma, Sanand and Pipavav Project Officer	91-9909923363		http://www.gidc.gov.in/
7	Gujarat Industrial Development Corporation (GIDC)		Mr. Jayesh N. Rao		cggidc@yahoo.co.in	http://www.gidc.gov.in/
8	Gujarat Industrial Development Corporation (GIDC)	3rd floor, Block no. 4, Udyog Bhawan, Sector 11, Gandhinagar - 382017	Ms. Alka Badlani, Town Planner, ATP Branch	91-9879110032		http://www.gidc.gov.in/
9	Gujarat Industrial Development Corporation (GIDC)	3rd floor, Block no. 4, Udyog Bhawan, Sector 11, Gandhinagar - 382017	Mr. Prashant Bhatt, GM, Land and Planning, Land department	91-9879110020, 079-23250656		http://www.gidc.gov.in/
10	Gujarat Industrial Development Corporation (GIDC)	3rd floor, Block no. 4, Udyog Bhawan, Sector 11, Gandhinagar - 382017	Mr. A.A Patel, Officer (Scientific Assisstant)	91-9925833149		http://www.gidc.gov.in/
11	Gujarat Industrial Development Corporation (GIDC)		Mr. N. Patel, Chief Engineer			http://www.gidc.gov.in/
12	Gujarat Industrial Development Corporation (GIDC)	3rd floor, Block no. 4, Udyog Bhawan, Sector 11, Gandhinagar - 382017	Mr. B.C. Makwana, Dy. Chief Engineer			http://www.gidc.gov.in/
13	Gujarat Industrial Development Corporation (GIDC)	3rd floor, Block no. 4, Udyog Bhawan, Sector 11, Gandhinagar - 382017	Mr. A. J. Shah, Executive Engineer	91-9879110089		http://www.gidc.gov.in/
14	Gujarat Industrial Development Corporation (GIDC)	1st floor, Block no. 4, Udyog Bhawan, Sector 11, Gandhinagar - 382017	Mr. Sashikant S. Patel, Dy. Chief Account Officer	079-23250635 (office), 079-23250649 (Fax), 91-9879110019		http://www.gidc.gov.in/

Sl. No.	Organisation	Address	Contact Person / Designation	Landline / Mobile Phone nos	Email	Website
15	INDEXTb		Mr. J.J. Shah	91-9978407606		
16						
17	Directorate of Petroleum, GoG	Block 15, 3rd Floor, Udyog Bhavan, Sector 11, Gandhinagar - 382011	Mr. Mandar Joshi	079-23237576/577/578, 079-23238648 (fax), 91-9825959519	mandar@gujaratpetro.com	
18	Dahej SEZ Ltd.	Block 5, 4th Floor, Udyog Bhavan, Sector 11, Gandhinagar - 382017	Mr. R.J. Shah, CEO	079-23248192, 91-9978405254	ceodsl@yahoo.in	
19	GSPL		Mr. Ravindra Agrawal, AGM (Commercial)	91-9825049416		
20	GSDMA		Ms Shetal, Engineer Executive	079-23259283		
21	GSDMA					
22	Gujarat Infrastructural Development Corporation (GIDB) Govt. of Gujarat Undertaking		Mr. Sion Bhattacharya	079-23232701		
23	Gujarat Infrastructural Development Corporation (GIDB) Govt. of Gujarat Undertaking	Block no.18, 8th Floor, Udyog Bhawan, Gandhinagar - 382017	Ms. Swati Buch	91-9824023107		
24	Gujarat Infrastructural Development Corporation (GIDB)	Block no.18, 8th Floor, Udyog Bhawan, Gandhinagar - 382017	Mr. Dilip Brahmabhatt, Senior Manager	079-23232701, 079-23232704, 079-23222481(Fax),	dbrahmbhatt@gidb.org	http://www.gidb.org
25	Gujarat Infrastructural Development Corporation (GIDB) Govt. of Gujarat Undertaking	Block no.18, 8th Floor, Udyog Bhawan, Gandhinagar - 382017	Mr. Haren Patel, Deputy Manager	079-23232701, 079-23232704, 079-23222481(Fax),	hpatel@gidb.org , haren05@gmail.com	http://www.gidb.org
26	Gujarat Infrastructural Development Corporation (GIDB) Govt. of Gujarat Undertaking	Block no.18, 8th Floor, Udyog Bhawan, Gandhinagar - 382017	Mr. Shardul Thakore, Deputy Manager	079-23232701, 079-23232704, 079-23222481(Fax),		
27	Gujarat Infrastructural Development Corporation (GIDB) Govt. of Gujarat Undertaking	Block no.18, 8th Floor, Udyog Bhawan, Gandhinagar - 382017	Mr. Bedi			
28	Old Sachivalaya,	Block No. 14, 2nd Floor, Dr. Jivraj Mehta Bhawan, Gandhinagar	Mr. K.M. Panchal, Chief Town Planner, Town Planning and Valuation Department	079-23254138 (O), 079-23254141(O), 079-27478782 (R)		
	Old Sachivalaya,	Block No. 14, 2nd Floor, Dr. Jivraj Mehta Bhawan, Gandhinagar	Mr. Janak Trivedi, Jr. Town Planner	91-9427029553		
	Old Sachivalaya,	Block No. 14, 2nd Floor, Dr. Jivraj Mehta Bhawan, Gandhinagar	Mr. Dutta, Town Planner	91-9426376680		
29	Old Sachivalaya,		Mr. Jha, Forests Department	079-23256578		
30	Old Sachivalaya,		R.J. Ansari, Forest Department			
31	New Sachivalaya		Mr. G.T. Chawra, Under Secy., Dept. of Energy & Petrochemical	079-23250785		
31	New Sachivalaya	Block No. 5, 5th Floor, Gandhinagar	Ms. Shobhana Desai Dy. Secretary, Energy & Petrochemical Dept	079-23250781 (O), 079-23224607 (R), 079-23250797 (Fax)		
32	Gujarat Maritime Board (GMB)		Mr. Raval,	079-23238346		
33	Gujarat Maritime Board (GMB)		Mr. J.P.Patel	079-23238346		
34	Gujarat Maritime Board (GMB)		Mr. J.V.Shah, A.E.	91-9228151374		
35	Gujarat Maritime Board (GMB)		Mr. Deepak Pathak, Mr. Devasio	079-23238363 (VC&CEO), 079-23238346/7/8 (PBX)		
36	Gujarat Maritime Board (GMB)		Mr. B.N. Gandhi, Executive Engg.	079-23238346, 9925153020		
37	Gujarat Maritime Board (GMB)		Mr. P.B. Talabia, Chief Engineer	079-23234699		
38	Gujarat Maritime Board (GMB)		Mr. C.N. Patel, Exen	91-9925153095		
39	GWSSB		Mr. N.M. Patel ,Chief Engineer, Planning, GWSSB	91-9427306503		

Sl. No.	Organisation	Address	Contact Person / Designation	Landline / Mobile Phone nos	Email	Website
40	GWSSB					
41	Gujarat Water Resource Development Corporation Limited (GWRDC) (Govt. of Gujarat Undertaking)	Sector 10-A, Near Bij Nigam, Gandhinagar - 382 043., Gujarat, India.	Mr. Jogesh Dave, P.A. to Mr. A.P. Bhavsar (M.D.)	079-23221499, Phone : +91 079-23220402, +91 079-23220988. Fax : +91 079-23221049.		http://www.gwrdc.gujarat.gov.in/
	State Water Data Centre (Under Water Resources Deptt, Govt. of Gujarat)	Near Walmi Campus, Sector-8, Gandhinagar-382007	Mr. Anil Shah	91-9099954003, Ph. 079-23246723(o) Fax:079 23249139		
41		Ground Water Management Investigation (GWMI) Circle	Mr. Tripathi Mr. A.G. Gohil (Superintendent Engineer)	Phone: (079) 232 45798 / 232 20313 / 232 29097 Fax: (079) 232 49973 / 232 20313	segeo.gwrdc@gmail.com	
42	GPCB		Mr. Bharat Jain			
43	GSRDC		Mr. Purabia/Mr. Mishra	079-23252912		
44	Gujarat Pollution Control Board (GPCB)	Environmental Planner	Mr. Rupesh Rajpurohit	91-9998710365		
45	Gujarat Pollution Control Board (GPCB)		Mr. Vatsani			
46	Gujarat Pollution Control Board (GPCB)		Mr. Vegra	079-23232167		
47	Sardar Sarovar Nagar Nigam Ltd.	Block no. 12, New Sachivalaya Complex, Gandhinagar-382010				http://www.sardarsarovardam.org/
48	Survey Of India, Gujarat, Daman & Diu Geo Spatial Data Centre	Sir Creek Bhavan, Sector 10A, Gandhinagar - 382010	Mr. D.Sahoo, Superintending Surveyor	079-23240451/52, 079-23291439@, 079-2323 7518, 91-9426341233	dirdgdgc@yahoo.com	
BHARUCH						
1	GPCB	Shed C1,119/3,GIDC Estate, Narmadanagar, Bharuch	Mr. V.R.Ghadge	02642-246333		
2	GPCB	Shed C1,119/3,GIDC Estate, Narmadanagar, Bharuch	Mr. Mukesh Shukla, Regional Officer	02642-246333		
3	GPCB	Shed C1,119/3,GIDC Estate, Narmadanagar, Bharuch	Ms. M.U. Patel, Deputy Engineer	91-9825645297		
4	GWSSB		Mr. P.K. Tillu, Executive Engg.	9427306652, 02642-265560		
5	GWSSB		Mr. K.Shah, Deputy Engg.	91-9427306654		
6	District Industries Centre (DIC)		Mr. M.R. Patel, Statistical Assistant	02642-243478		
7	District Industries Centre (DIC)		Mr. Ashwin Patel	02642-232269		
8	District Industries Centre (DIC)	Near Gayatrinagar, B/h. Falsruti Society, Near Collector Office / Bahumali Complex, Bharuch - 392001	Mr. S.D. Parmar, Incharge Manager Economics Investigator	02642-222438	gm-dic-bha@gujarat.gov.in	
9	District Industries Centre (DIC)	Near Gayatrinagar, B/h. Falsruti Society, Near Collector Office / Bahumali Complex, Bharuch - 392001	Mr. Rajesh Modi, Senior Inspector	09227420149, 02642-243478, 02642-240981, 02642-241602 (Fax)	gm-dic-bha@gujarat.gov.in	
10	District Industries Centre (DIC)	Near Gayatrinagar, B/h. Falsruti Society, Near Collector Office / Bahumali Complex, Bharuch - 392001	Mr. Rajesh I. Chavda, General Manager	02642-243478, 02642-240981, 02642-241602 (Fax)	gm-dic-bha@gujarat.gov.in	
11	GMB		Mr. Satish Bhai Shah	91-9824107528		
12	GIDC		Mr. M.P.Chawra, Executive Engg.	91-9879110050		
13	GIDC		Mr. U.C.Shah ,S.E.,	91-9879110065		
14	Agri Dept.		Mr. S.Y. Patel, Agricultural Officer	02642-252471		
15	District Education Office		Mr. K.D.Bagra	02642-240424		
16	Sardar Sarivar Nagar Nigam		Mr. R.G.Dhangad, Executive Engr.	91-9824207886		
17	GETCO		Mr. B.R. Panchal ,S.E.	91-9925211046		

Sl. No.	Organisation	Address	Contact Person / Designation	Landline / Mobile Phone nos	Email	Website
18	BSNL		Mr. K.D.Parmar, BSNL	91-9426581839		
19	BSNL, Bharuch Telecom	Old civil Lines, beside DSP Office,	R.Y. Yadav, Divisional Engineer	91-9426747300, 02642-223232		
20	BSNL, Dahej		Mr. Rana, Sub divisional Officer	91-9427110808		
21	BSNL, Bharuch Telecom	Old civil Lines, beside DSP Office,	Mr. S.K. Dutta Rao, AGM Planning	91-9426747101, 02642 240100, 02642 250100		
22	PWD		Mr. B.S.Gohil Thakur, Exe Engg., R & B Deptt., Bharuch	91-9824039551		
23	PWD	SubDivisional Office, R & B Bharuch	Mr. C.M. Patel ,	91-9426480882		
24	Road and Building Division	National Highway Division M. S. Building, Nr. New Court Bldg., Bharuch,	P.M. Jadav, Asst. Draftsman	(O) 02642-243408, 241126 (F) 02642-269159, 91-9898435467		
25	Road and Building Division	National Highway Division M. S. Building, Nr. New Court Bldg., Bharuch,	K.V. Patel, Executive Engineer	91-9227124502		
26	Town Planning and Valuation Department	Town Planning Dept., M. S. Building, Nr. New Court Bldg., Bharuch,	Mr. N.M. Desai, Town Planner, Bharuch	91-9925160485		
27	DILR Office	District Inspector of Land Records Revenue Department, Bharuch	Mr. Manohar Bhai, Head Clerk, DILR	02642-260843, 263943		
28	Bharuch Goods Office , Rlyw Stn		Mr. Sanjay Kaushik , Chief Goods Supervisor	02642-265045		
29	Bharuch Railway Station		Mr. P.H. Parmar, Station Manager	02642-267347		
30			Mr. H.K.Rajput , Mamladar, Vagra	9426314147, 02641-225221		
31			Mr. Dholiya , Mamladar , Bharuch	9825390113 , 02642-243536		
32	Gujarat Gas		Mr. Lizi Abraham , Associate Manager, Commercial	9824203241, 02642-243352		
33	District Collector's Office ,	District Collector's office, Bharuch	Ms. Arti Kanwar, Collector Bharuch	Office: 02642-240600, Fax-240602, 251900 , Residence: 02642-22301 to 223701 , Mobile: 9978406205	collector-bha@gujarat.gov.in	http://revenue department.gujarat.gov.in/
34	District Collector's Office ,	District Collector's office, Bharuch	Ms. Vakde, Addl Chitnis	02642-243499		
35	District Collector's Office ,	District Collector's office, Bharuch	Mr. Prajapati, Resident Deputy Collector			
37			Mr. H.K.Rajput , Mamladar, Vagra	9426314147, 02641-225221		
38			Mr. Dholiya , Mamladar , Bharuch	9825390113 , 02642-243536		
39	Collectors Office		Ms Jyoti, Deputy Mamladar	91-9427103510		
40	Revenue department	District Collector's office, Bharuch	Shri B. M. Jotaniya, Mamlatdar, Bharuch	02642-243536, 242218 Phone(R): 02642-260354 Mobile: 9925036142		
41			Mr. D.M. Pandya, Mamlatdar, Vagra	02641-225221, 91-9925944006		
42	District Development Office	District Panchayat, Bharuch	Dr. Rajendrakumar , District Development Officer, Bharuch	02642- 240603, 252313 , 99784 06230 , Fax No. : 02642 - 240951	ddo-bha@gujarat.gov.in	http://bharuchdp.gujarat.gov.in/bharuch/english/index.htm
43	District Development Office	District Panchayat, Bharuch	Mr. N.V.Patel, DDO	02642 240594 (fax), 243404, 242402 (R), 91-9825128852		
44	District Development Office	District Panchayat, Vagra	Mr. V.J. Sosa, DDO	02641-225697 (Fax), 225223 (O), 91-9426261804		
45	District Development Office	District Panchayat, Bharuch	Ms. Jigisha Pathak, Deputy DDO	91-9904315263		
46	Taluka Panchayet Office	Near Hotel Plaza, Station Road, Bharuch-392001	M. Azad Bhai, Statistical Assisstant	91-987922562		
47	District Education Office, Bharuch	District Education Office, Near Sevashram, Hostel Ground, Bharuch	Mr. B.M. Rajgore, Education Officer	02642-240424		
48	District Education Office, Bharuch	District Education Office, Near Sevashram, Hostel Ground, Bharuch	Mr. Suman Manparaya			
49	District Education Office, Bharuch	District Education Office, Near Sevashram, Hostel Ground, Bharuch	Mr. Suresh Bhai	91-9428179004		
50			Mr. A.G. Manekad, Dist. Level Branch Coordinator	91-9825008611		

Sl. No.	Organisation	Address	Contact Person / Designation	Landline / Mobile Phone nos	Email	Website
51	District Employment Exchange	Block A, Ground Floor, Collector office, Behind Ayojan Bhavan Bharuch-392001	Mr. V. D. Vasava, Employment Officer	91-9825552438, (02642) 260702	dee-bha@gujarat.gov.in	
52	District Employment Exchange	Block A, Ground Floor, Collector office, Behind Ayojan Bhavan Bharuch-392001	Mr.K.M. Chowdhry, Jr. Employment Officer	91-9824784315		
53	District Collector's Office ,	Block A, Ground Floor, Collector office, Behind Ayojan Bhavan Bharuch-392001	Mr. Sandip Khopkar, Sr. Geologist	91-9726587150		
54	RTO		Mr. H.L. Parekh, In charge ARTO	91-9825382666, 02642-240653		
55	RTO		Mr. Bharat Bhai Rathava	02642-240653		
56			Mr. Gavita, District Statistical Officer (DSO)	02642-26222		
57	Gujarat Water Supply and Sewerage Board	15 to 18, 2nd Floor, 2nd Floor, Amardeep Complex, Falshurti Nagar, Station Road, Bharuch	H.G. Sheth, Executive Engineer, Public Health Works Division	02642-265560, 91-9978406652		
58	Dakshin Gujarat Vij Company Limited	Nana Varachha Road, Kapodara, SURAT-395 006		Phone no : (0261) 2804202/2804206/2804499 Fax No.: (0261) 2572636	dgvccl@gebmil.com	
59	Gujarat Energy Transmission Corporation Limited (GETCO)	Gujarat Energy Transmission Corporation Limited (GETCO) Transmission Circle Office, AT & Post : Maktampur	Mr. V.G. Choudhury	Phone No:(02642) 227306 Fax: (02642) 227303, 91 9925211244		
60	Gujarat Energy Transmission Corporation Limited (GETCO)	Gujarat Energy Transmission Corporation Limited (GETCO) Transmission Circle Office, AT & Post : Maktampur	Mr. N.K. Solanki, SE Transmission	91 9925212898		
61	Gujarat Energy Transmission Corporation Limited (GETCO)	Gujarat Energy Transmission Corporation Limited (GETCO) Transmission Circle Office, AT & Post : Maktampur	Mr. H N Raj, Deputy Engineer	91 9925211053		
62	Gujarat Energy Transmission Corporation Limited (GETCO)	Gujarat Energy Transmission Corporation Limited (GETCO) Transmission Circle Office, AT & Post : Maktampur	Mr. R. M. Rathod, DE Tech I	91-9925211046		
63	Gujarat Energy Transmission Corporation Limited (GETCO)	Gujarat Energy Transmission Corporation Limited (GETCO) Transmission Circle Office, AT & Post : Maktampur	Mr. A.H. Rana, DE Tech II	91-9925211045		
64	GWRDC	15, Falshurti Nagar, 2nd Floor, Station Road, Bharuch	Mr. Praveen Kanungo	91-9978406653		
65	Guajrat Chemical Port Terminal Company Limited	Lakhigam, Via: Dahej, Ta Vagra, Dist., Bharuch	Mr.Dattanand D.Heranjal, Chief Financial Controller & Company Secretary	02641-261009, 9825323565	cfo.gcptcl.in	
VADODARA						
1	Western Railway Office		Mr. Subhash Gupta, Sr. Divisional Engineer	0265-2641692		
2	Office of Divisional Railway Manager, Pratapnagar	Pratapnagar, Vadodara, Gujarat-390004	Mr. Pankaj Uke, IRTS, Sr. Divisional Operations Manager, Western Railway, Vadodara	0265 2641192, 0265 264 1553, 91-9724091900		
3			Mr. Samir Raval, State Road Project Division	91-9824014040		
4	Office of Divisional Railway Manager, Pratapnagar	Pratapnagar, Vadodara, Gujarat-390004	Mr. Santosh Kumar, Sr. Den, South			
5	Office of Divisional Railway Manager, Pratapnagar	Pratapnagar, Vadodara, Gujarat-390004	Mr. Amar Singh, Sr. Den, South	91-9724091204		
6	Bharuch-Dahej Railway Co. Ltd.	Rubylite Building (3rd Floor), 32, Ajit Nagar Society, Dinesh Mill Road, Vadodara - 390007.	Mr. R.N. Kalita, Coordinating Dir / CEO			http://bdrail.in/default.html
7			Dr. Jessica P. Karia, Manager (GIS)	0265-2340036		
8	ONGC Petro additions Limited (OPaL)	4th Floor, VCCI Commercial Complex, 73-GIDC Makarpura, Vadodara - 390010	Mr. A.K. Chattopadhyay, General Manager (Projects)	0265 3935000, 0265 3935001(D), 0265 2974091(R) , 91 9426612036 (M), 0265 3935009 (Fax)		

Sl. No.	Organisation	Address	Contact Person / Designation	Landline / Mobile Phone nos	Email	Website
9	ONGC Petro additions Limited (OPaL)	4th Floor, VCCI Commercial Complex, 73-GIDC Makarpura, Vadodara - 390010	Mr. Raj Kamal Gupta, Chief Engineer(C&M)	0265 3935000, 0265 3935004(D), 0265 2656006(R) , 91 9428007602, 91 9824250855(M), 0265 3935009 (Fax)		
10	Sardar Sarovar Narmada Nigam Ltd. (a wholly Owned Govt. of Gujarat undertaking)	Block-B, 1st Floor, Narmada Naher Bhavan, Chhani Jakat Naka, B/h Chhani Octroi Post, Vadodara - 390 002	Mr. K.S. Srinivas, Chief Engineer	0265-2771643, 0265-2771240, 91-9825011347, 0265-2772383 (Fax)	cecl-ssnl@gujarat.gov.in	http://www.sardarsarovardam.org/
11	Sardar Sarovar Narmada Nigam Ltd. (a wholly Owned Govt. of Gujarat undertaking)	Block-A, 2nd Floor, Narmada Naher Bhavan, Chhani Jakat Naka, B/h Chhani Octroi Post, Vadodara - 390 002 Residence Address: B-1, Nalanda Society no. 1, Opp. Nalanda Water Tank, Waghodia Road, Vadodara - 390009,	Mr. Mahesh A. Pathak, Soil Survey Officer	91-9979851308, 0265-2514156, 0265-2775766		http://www.sardarsarovardam.org/
12	M.S. University	Faculty of Science, Geology Department, Sayajiganj, Baroda - 390002	Prof. S. Ganapati, Department of Geology	91-9428819925		http://www.msubaroda.ac.in/
13	M.S. University	Faculty of Science, Geology Department, Sayajiganj, Baroda - 390002	Prof. Nikhil Desai, Department of Geology, HoD	0265-2785560		http://www.msubaroda.ac.in/
14	M.S. University	Faculty of Science, Geology Department, Sayajiganj, Baroda - 390002	Dr. Manoj Limaye, Department of Geology	0265-2785560		http://www.msubaroda.ac.in/
15	Vadodara Irrigation Division	6 and 8th Floor, E Block, Room no. 802-803, Kuber Bhawan, Vadodara-390001	Mr. G.S. Jansali, Executive Engineer	91-9426747780		
16	Gujarat Engineering Research Institute (GERI)	Geology Department, Race Course, Elora park, Vadodara - 390007	Mr. Hashmukh Vagella	0265 2313414		http://www.gerionline.org/
17	Gujarat Engineering Research Institute (GERI)	Geology Department, Race Course, Elora park, Vadodara - 390007	Mr. Mittal	0265 2313414		http://www.gerionline.org/
18	Gujarat Engineering Research Institute (GERI)	Hydraulics Department, Gotri Road, Vadodara - 390007				
ANKLESHWAR						
1	GIDC Regional Office, Ankleswar	Plot No.624, Admn. Complex, GIDC Industrial Estate, Walia Road, Ankleshwar 393 002	Mr. Salim	91-9898458856, 02646-223561		http://www.gidc.gov.in/ContactUs/Contactus_RO.html
2	ONGC	Ankeleshwar Asset, Ankeleshwar, Gujart	Mr. Sylvam, SubSurface Dept./ Mr. Anil K. Safaya, Dy. General Manager	02646-237900, 237013, 09426632047	safaya93@gmail.com	
DELHI						
1	MITES		Mr. Rao,MITES,Gurgaon	91-124-2571666		
2	Ministry of Railway, Rail Bhaban, New Delhi		Executive Dir. Traffic	011-23782539		
3	Directorate General of Hydrocarbons	C-139, Sector-63, NOIDA-201301	Mr. Anurag Gupta, DGM(Geology), HOD (PSC)	0120-4029451, 9810835582		
4	Rail Vikas Nigam Ltd.	Pilot no. 25, First Floor, August Kranti Bhawan, Bhikaji Cama Place. R. K. Puram, New Delhi		011-26738195 / 8295 / 8395 / 8495, 011-26182957 / 2961 (Fax)		
5	Bharuch-Dahej Railway Co. Ltd.	Registered Office 1st Floor, August Kranti Bhawan, Bhikaji Cama Place, New Delhi - 110066				

I.2. Key Stakeholder Consultation record

Record of meeting/discussion



Project Title DDP of Gujarat PCPIR

Division MCD-ISA

Subject Base Map Finalisation

Project No. 245268AA01

Location GIDC, Udyog Bhavan, Gandhinagar, Ahmedabad **Date of Meeting** 23rd April 2010

Present Mrs. Sarojini Addn. Chief. Ms. Shoma Divisional Director,
Thakur, Secretary Majumdar, Mott MacDonald
Dr. Nagin Nanda IFS, Director, DEST Madhurima Project Manager,
Waghmare Mott MacDonald
Mr.K.D.Rana, Addl. Director,
DEST
Dr. Arvind Bhatt, Principal Scientist,
DEST

Recorded by Madhurima Waghmare	Distribution Internal
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Item	Text	Action on
1 – RFP and CA	<p>Following four issues were discussed in the meeting.</p> <p>Since the documents including the RFP, CA and the Project Information Memorandum (PIM) for the HP BT park project have been finalised, it was decided by the Department in the meeting to float the RFP to the selected bidders at the earliest possible. 14th October, 2010 was the date finalised for the issuance of the same. The subsequent dates (excluding local holidays and official holidays) will also be followed as per the bid process schedule in the RFP.</p> <p>Accordingly Mott MacDonald will post the required 10 copies to DEST at the earliest possible on receipt of any corrections by DEST on the PIM document</p>	MM & DEST
2 – Action Plan for the completion of the Module II	<p>As per the Bid schedule in the RFP document the RFP stage is likely to be completed by the early December. However, since the cabinet approval will be required for his finalisation of he selected bidder, the entire process might get extended upto January 2010. Further to which the conclusion of transaction's activity can be completed with the selected bidder. Looking into these time requirements, it was suggested by DEST that the Bank Guarantees should be extended for the third and final time for this project till June, 2010</p>	MM&DEST

Record of meeting/discussion

Continuation sheet



Project No.

Date of Meeting

Item	Text	Action on
3 Release of Payment for the project	Mott MacDonald has requested for the release of payment at this stage for the HP BT Park Project, to which Director, DEST informed that they would release the payment against the receipt of the deliverables for the project at the stage and respond sincerely to payment request of Mott MacDonald	DEST
4 Extension of Bank Guarantees	Looking into the time requirements mentioned in point number 2, it was suggested by DEST that the Bank Guarantees (BGs) for the HP BT Park Project should be extended by Mott MacDonald for this project till June, 2010. Since the project has overshoot its timelines and the BGs have been already extended two times till now, Mott MacDonald indicated that this will be the final time that they will be able to extend the BG timeline.	
5 Tripartite Agreement in RFP document	Mott MacDonald informed again that the tripartite agreement included in the RFP document has been expired and needs renewal. ACS Madam asked DEST to address this issue in priority and DEST informed that they will do the needful for the same.	DEST

Record of meeting/discussion



Project Title DDP of Gujarat PCPIR

Division MCD-ISA

Subject Base Map Finalisation

Project No. 245268AA01

Location Secretariate, Gandhinagar

Date of Meeting 10th June 2010

Present Maheshwar Sahu,	PS (Industries and Mines), GoG	Shoma Majumdar	Divisional Director, Mott MacDonald
Mr Nayan Rawal	Advisor (Proj), GIDC	Madhurima Waghmare	Sr Consultant and Project Manager DDP GPCPIR, Mott MacDonald
Mr Bhowmik	Advisor (TP), GIDC	Biren Dalal	Sr Consultant and PM DDPGPCPIR, Mott MacDonald
Mr Ashok Nakum	Asst Manager, GIDC		
Mr Bhatt	Shri Prashant Bhatt GM (Planning & Land), GIDC		
Mr Diwakar Sharma	Asst Manager, GIDC		
C N Patel	GMB, Gandhinagar		
B B Mehta,	Sup Engg, GETCO		
Roopwant Singh	Collector, Bharuch		
M Dholawiya	R&B Dept, Gandhinagar		
Swati Bhuj	GM, IDB		
Japal Singh	Addn Secy, Water Supply		
V Q Ghadge	Sr, Env Enggi, GPCB, Gandhinagar		

Recorded by Madhurima Waghmare	Distribution Internal
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Item	Text	Action on
1	MM presented the details of the revised Land area of GPCPIR and other aspects of the progress of work in the project of preparation of DDP for GPCPIR to the PS Industries and Mines, GoG and the officers from various departments	MM & GIDC
2	In terms of the revision in the area of GPCPIR , PS, Industries and Mines has informed MM and GIDC:	MM & GIDC

Record of meeting/discussion

Continuation sheet



Project No.

Date of Meeting

Item	Text	Action on
3	<ul style="list-style-type: none"> to keep the total area of GPCPIR close to 453 sq km And the number of villages as 44 nos as per the Gazette Notification of GPCPIR <p>In terms of the Infrastructure Development in GPCPIR, PS, Industries and Mines has informed the following:</p> <ul style="list-style-type: none"> MM to list the suggested infrastructure augmentation & development options priority wise Mr N K Patel to include the development of Vagra-Pakhajan Road in 1st phase. MM to discuss the plans of road development in PCPIR with Mr N K Patel and the R&B department The CETP in PCPIR will be proposed only for the SSI cluster and the large and medium industries will have to follow the strictly prescribed norms as per GPCB for discharging the effluents in the marine outfall. MM to discuss with the Director of with aviation, GoG on the appropriateness of 200 ha (as suggested by the Director of civil aviation) for an airstrip. MM to include the phase wise expansion detailing (12 MMPTA in phase 1 and 20 MMTPA in phase II) of the proposed port by Ms Sterling Port Ltd near Old Port, Dahej MM to interact with GIDC engineers to incorporate the details of hazardous waste system in GPCPIR To cross check/incorporate the mapping details of the Gas and Oil infrastructure done by Index 'B' Agreement and emphasis on the planning and use of services corridors in the proposed land use plan for Gas pipelines For Flood Risk 	MM & GIDC

Record of meeting/discussion

Continuation sheet



Project No.

Date of Meeting

Item	Text	Action on
4	<p>In terms of the Flood Risk Assessment for GPCPIR, PS, Industries and Mines has informed the following:</p> <ul style="list-style-type: none"> To work on options of linking of the natural water channels in GPCPIR area. GIDC to commission a study to WAPCOS for water harvesting, conserving and water channel linking options incorporating Rain water harvesting to be made compulsory for each industrial unit Industry can also be priced differentially as per the use of energy conservation techniques. Use of solar energy can generate benefits MMs industrial survey outputs should be used to improve the infrastructural services and requirements of the existing industries especially in terms of social infrastructure to industries, floating population requirements, worker colonies to be located appropriately throughout the industrial areas Development of various sized hotels was also suggested 	GIDC, MM
4	No change to be maintained in the available Industrial area as per the GPCPIR Application	MM
5	MM to take input from Ankaleshwar Industrial Association in terms of their study on Industrial sizing	MM
6	Ms Swati Bhuj, GIDB suggested to check details of Kalpasar project as their diversion canal proposal can divide the GPCPIR area into two parts	
7	Collector, Bharuch suggested to propose ship building activities on southern edge sue to suitability of the land. However GIDC and GMB to work out possibility of breakwater system to prevent erosion on this edge	MM, GIDC, GMB
8	Collector Bharuch & PS, Industries and Mines discussed & suggested to incorporate appropriate planning principles and measures for the buffer zone for the Gamtal ranging between 300-500 m. With a	

Record of meeting/discussion

Continuation sheet



Project No.

Date of Meeting

Item	Text	Action on
9	<p>100-200 m of a zone where no permanent structures will be allowed and remaining area to allow only residential & commercial & institutional activity. Also to work on TP Scheme planning for the Gamtals initially targeting 4-5 villages in Dahej 1</p> <p>PS, Industries and Mines suggested to include and work for:</p> <ul style="list-style-type: none"> • Seamless connectivity to the Dedicated Freight Corridor • Sufficient logistics areas in GPCPIR. Collector Bharuch emphasize on the need of suggested to propose Transport Nagars in GPCPIR • Incorporate the proposal for an eco city in PCPIR by Japanese delegation for an area of around 1000 ha 	MM, GIDC, GIDB

Record of meeting/discussion



Project Title Draft Dev Plan for Gujarat PCPIR

Division [MCD-ISA](#)

Subject Discussion with Richard Chin on provision of an Air Strip in GPCPIR

Project No. 245268

Location DMC, Noida

Date of Meeting 13 5 2010

Present Richard Chin

Madhurima

Recorded by Madhurima	Distribution Internal	
Item	Text	Action on
1	<p>Background</p> <ul style="list-style-type: none">VC & MD has made an important observation. We need to make some provision for an Air Strip/Airport within the PCPIR. PI arrange to make a suitable provision in the Master PlanVC&MD had a detailed meeting with Shri Ajay Chauhan, Director of Aviation, GoG last week. Shri Chauhan can be contacted on 09824006556. It was desired that the location of the airstrip/airport be placed in the central area of the PCPIR. Shri Chauhan will provide you the details of area/length-breadth etc. You may kindly get in touch with him and keep me posted of developments.Shri Ajay Chauhan, Director of Aviation, GoG informed that an area of 200 ha should be allotted in GPCPIR for the Airstrip. Also they are planning for more than one airstrip in the region. But we need to plan for one only in gpcpir	<p>GIDC, MM</p> <p>GIDC, MM</p> <p>MM</p>
2	<p>Richard Chin advised to consider the dimension of 4kmx.5km for the airstrip oriented in e-w direction as per the wind direction in this zone. (Map on next page, other bullet points also recorded)</p> <p>We may refer to International Council of Aviation Office (ICAO) regulations for details</p>	<p>MM</p> <p>MM</p>

Record of meeting/discussion

Continuation sheet

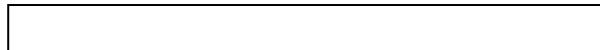


Project No.

Date of Meeting

Item	Text	Action on

Airstrip of 4 kmx.5 km



Runway length- 2 km for commercial planes

75m northern margin, 40-60 m runway width, 35-40m to south, remaining for the buildings

- No buldg ht more than 15 mt in 2km radius
- No building ht more than 45 mt in 14km radius

Agenda



Project Title	GUJARAT PETRO-CHEMICAL PETROLEUM INVESTMENT REGION	Division	MCD
Subject	Follow up on the GAIL Gas pipelines cadastral maps	Project no.	245268
Location	GAIL, Dahej	Date of meeting	30 th June 2010
Attendees	Mr. Khundawala, GAIL, Dahej.	Time of meeting	1300 hrs
Ms. Anushree Ray	Ms. Richa Rathi, Consultant, Mott MacDonald		

Item	Text	Led by
1	Mr. Khundawala provided DUPL line cadastral maps (for scanning) of 7 villages, namely, Ambheta, Rahiad, Kaladara of Vagra Taluka and Eksal, Kesrol, Bhadbhut, Kasva-Samni of Bharuch taluka.	
2	Discussion about the DVPL-1 and DVPL-2 gas pipeline and suggested to meet Mr. Anirban Bhomick, Sr. Manager in order to follow up the mailed request for the cadastral maps of DVPL 1 at Regional Pipeline Network Headquarters, Vadodara.	
3	The DVPL-2 gas pipeline is under construction passing from the GPCPIR area parallel to DVPL-1. It was informed that 10 mts along DVPL-1 line ROU has been acquired for laying the new line and a distance of 5mts minimum is maintained between the gas pipelines. (Onsite observation: 7 mts dist. between the gas pipelines).	

Agenda



Project Title GUJARAT PETRO-CHEMICAL PETROLEUM INVESTMENT REGION **Division** MCD

Subject Follow up on the GAIL Gas pipelines cadastral maps **Project no.** 245268

Location GAIL, Vadodara **Date of meeting** 1st July 2010

Attendees Mr.Anirban Bhowmik, Sr. Manager, GAIL, Vadodara. **Time of meeting** 1600 hrs

Ms. Anushree Ray Ms. Richa Rathi, Consultant, Mott MacDonald

Item	Text	Led by
1	Mr.Anirban Bhowmik informed the Mott MacDonald team about the availability of cadastral maps for DVPL-1 pipeline. The request will be forwarded to the C.A. for the same and the data will be provided for available villages	
2	Cadastral maps of DVPL 2 are not available since it is under construction; hence it shall be assumed that it will be laid parallel to DVPL 1.	

Agenda



Project Title	GUJARAT PETRO-CHEMICAL PETROLEUM INVESTMENT REGION	Division	MCD
Subject	Expansion Plans of GMB	Project no.	245268
Location	GMB, Bharuch	Date of meeting	28.06.10
Attendees	Mr. Shah, GMB, Bharuch	Time of meeting	1030 hrs
	Ms. Richa Rathi, Consultant, Mott MacDonald.		

Item	Text	Led by
1	About the soil bearing capacity of the Dahej area: Sterling Pvt. Ltd. is developing the new proposed Dahej port and is conducting the Soil bearing capacity test which will be mentioned in its DPR report.	
2	Mr. Shah informed that in order to reduce the travel distance between Bhavnagar and Dahej, a Ro-Ro service is under proposal between Dahej and Ghogho (small port in Bhavnagar).	
3	Clearance for the various activities inclusive of the industrial development for handling hazardous substances and storage is required from MoEF. GMB gives clearance for riverfront activities only, such as port related, ship building and cargo import and export. Sterling has acquired clearance for the berth, cargo handling, storage facilities (solid and liquid but not for hazardous/gaseous substance).	
4	It was indicated in the meeting that the southern end of the notified GPCPIR, the northern bank of River Narmada does not have enough draft for jetty. Hence dredging would be necessary for any such shipment. Hydrographical study of this area is under way. The key resource person for the same is Mr. Atul Sharma, GMB, Gandhinagar.	
5	The shipbuilding policy was discussed including the application of spatial extent of the policy from Dahej SEZ till Bhukhi khadi, river front requirements for the industry and a copy of the policy (pdf) was supplied by Mr. Shah. At present ABG and Shoft along River Narmada are two of the existing shipbuilding industries. For any further discussion at policy level, he suggested to meet Mr. Gandhi, GMB, Gandhinagar.	

Record of meeting/discussion



Project Title DDP of Gujarat PCPIR

Division MCD-ISA

Subject DDP GPCPIR Proposed land use and infrastructure

Project No. 245268AA01

Location GIDC, Gandhinagar

Date of Meeting 12th August 2010

Present Mr Agarwal	VC&MD, GIDC	Madhurima Waghmare	Sr Consultant and Project Manager DDP GPCPIR, Mott MacDonald
Mr Nayan Rawal	Advisor (Proj), GIDC	Biren Dalal	Project Manager, Mott MacDonald
Mr Bhatt	Shri Prashant Bhatt	Mr Ajay Rana	Consultant, Mott MacDonald
	GM (Planning & Land), GIDC		
MR Patel	CE, GIDC		
Mrs Alka Badlani	ATP, GIDC		
Mr Ashok Nakum	Asst Manager, GIDC		

Recorded by Madhurima Waghmare	Distribution Internal
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Item	Text	Action on
1 Road proposals and alignments	<p>MM discussed about the following main road links in GPCPIR:</p> <ol style="list-style-type: none"> MM discussed that existing Bharuch-Dahej SH6 to be proposed for 150m right of way (RoW) VC&MD (with reference to his discussion with PS Industries and Mines) suggested that for the proposed expressway a row of 250m should be considered as it would be developed in BOT mode and out of the 250 m, an area of around 50 m will be available for the developer for sale. MM had included the same in the DDP proposal. MM discussed that a road link with 120m RoW to be proposed on the northern side of GPCPIR. This is needed in order to link the proposed industrial area from Dahej till vilayat estate. VC&MD was in overall agreement with the proposed RoWs 	GIDC&MM

Record of meeting/discussion

Continuation sheet



Project No.

Date of Meeting

Item	Text	Action on
	<p>5. Mrs Badlani informed about the proposal of Jolwa Pakhajan Vagra State Highway upto Rahiyad Crosting Rs. 39 Crore VC&MD suggested that GIDC should discuss this with R&B department as this road will be partly merging in the proposed express highway suggested in the DDP.</p>	
2	<p>Land use Distribution</p> <p>The land use distribution in GIDC expansion Dahej-phase 3 and 4 were discussed between MM, VC&MD-Mr Agarwal and Mrs Badlani. VC&MD suggested including the area above the Atali housing site in Processing zone.</p> <p>VC&MD also suggested to include an area of 250 meters along both sides of Bharuch-Dahej SH 8 and 250 m on northern side of the road parallel to Narmada river (also called as the coastal road) in non/less polluting industrial zone</p> <p>VC& MD suggested GIDS to check with GNFC & GACL or their expansion plans for the present & future. He suggested MM to include this possibility found by GIDC on enquiry in the DDP.</p> <p>MM discussed about the proposed position in the DDP and the requirements for the airstrip as per the Civil Aviation Department as suggested by their Director. VC& MD suggested the air strip could be proposed outside of PCPIR area and the District Collector should be informed for land reservation by GIDC.</p> <p>MM discussed that area as possible has been suggested to be maintained as agriculture land use in the proposed DDP. Part of Manad village in GPCPIR is included in the same. VC&MD informed that GIDC is OK with the same and will consider this in their acquisition plans.</p> <p>VC&MD asked MM to discuss the infra and utility aspect with CE, GIDC. MM informed that they have already discussed with CE on all infrastructure sectors except for power supply.</p> <p>VC&MD suggested MM that the planning for power should be discussed with SE Electrical, Mr. K A Patel and earmarked location for landfill site by</p>	<p>MM &GIDC</p> <p>MM &GIDC</p> <p>GIDC &MM</p> <p>GIDC & MM</p> <p>GIDC</p> <p>MM, GIDC</p>

Record of meeting/discussion

Continuation sheet



Project No.

Date of Meeting

Item	Text	Action on
	GIDC shall be discussed with Mr. D S Parmar.	
	MM discussed the proposed alignment of diversion canal for Kalpasar project and suggested that it should be realigned and as it should affect minimum of PCPIR area. VC&MD suggested to include the recommended alignment of the Canal in the DDP	MM
	For the development of the area, the area of TP Scheme was also discussed to be considered in the range of around 1000 -2500 Hectares. This was suggested by PS Industries and Mines and Advisor (TP).	MM
3	EIA and NEERI related VC&MD suggest that in order to have a commonality in the data of both the DDP and EIA activities., GIDC should provide necessary sharing and coordination of data between both the working agencies - MM and NEERI	MM, GIDC, NEERI

Record of discussion



Project Title DDP of Gujarat PCPIR

Division MCD-ISA

Subject Draft Development Plan for GPCPIR

Project No. 245268AA01

Location Gandhinagar, Ahmedabad

Date of Meeting 24th September,
April 2010

Present M M Bhoumik

Advisor (TP), GIDC Madhurima
Waghmare

Sr Consultant and
Project Manager
DDP, Mott
MacDonald

Ms Minaxi

TP Team member, Ajay Rana
GIDC

Engineer, Mott
MacDonald

Recorded by Madhurima Waghmare	Distribution Internal
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Item	Text	Action on
1	MM and Advisor TP, GIDC discussed on the following aspects	
a	<p>The format for the submission of the Draft Development Plan Reports and Maps. Advisor TP suggested the following format:</p> <p>REPORT</p> <p>Volume I- Existing Situation and Analysis Volume II- Development Plan Proposals (including comprehensive Implementation Strategy section) Volume III- GDCR for PCPIR Maps Related studies to be included in any of above volumes as appropriate</p> <p>MAPS</p> <p>A1 size sheets covering entire PCPIR divided in grid Sheets in the A1 Map folder for proposed land use plan: Index, Key Map, Legend, A0 entire plan, 1:8000 in sheets, A0 infrastructure sheets sector by sector This folio format is for LUT as well as Proposal Plans Sheets in the A1 Map folder for existing land utilisation plan: Index, Key Map, Legend, A0 entire plan, 1:8000 in sheets including existing land use and existing infrastructure information</p> <p>Space for following Signatures in Map: Chairman, RDA for GPCPIR Chief Executive, RDA for GPCPIR Technical Expert, RDA for GPCPIR</p>	MM GIDC

Record of discussion

Continuation sheet



Project No.

Date of Meeting

Item	Text	Action on
2 a	The Land use zoning was discussed and decided that it should be consistent in GDCRs and Proposed Land use Plan and will broadly include PCP, Shipbuilding and port related and Engineering Industries	MM, GIDC
3 a	MM to incorporate the selected GDCR sections under preparation by GIDC for the GPCPIR.	GIDC and MM. Sections are provided to MM
4	Very brief discussion on the Implementation Strategy chapter to be included in the DDP report	MM to discuss this in the forthcoming presentation on the DDP

Record of meeting/discussion



Project Title DDP of Gujarat PCPIR

Division MCD&IWU

Subject Draft Development Plan for GPCPIR

Project No. 245268AA01

Location Gandhinagar, Ahmedabad

Date of Meeting 24th September,
April 2010 & 28th
September 2010

Present Mrs Badlani

ATP, GIDC

Madhurima
Waghmare

Sr Consultant and
Project Manager
DDP, Mott
MacDonald

Mr Bhatt

GM-Planning
Land, GIDC

& Ajay Rana

Engineer, Mott
MacDonald

Recorded by		Distribution
Madhurima Waghmare		Internal

Item	Text	Action on
1	MM and GM (Land and Planning discussed on the following aspects	
a	The area of Bhersam and Sayakha Villages as proposed in the processing area in the draft proposed land use plan	MM gave the map of the two villages for reference with proposed land use plan to GIDC on 28 th Sep, 2010
b	GM, Planning and Land discussed about the proposed suggestive Kalpasar diversion canal alignment & about Its area passing through the proposed processing area in Bhersam Village and ongoing land acquisition process. Both MM and GIDC are of the opinion that since the alignment is only suggestive GIDC needs to discuss with the Kalpasar Department for the agreement on the alignment.	GIDC
2	a	ATP, GIDC discussed about the Gamtal buffers within Dahej 3&4 and villages in the proposed processing area
	b	With reference to the possibility of shifting the road near Narmada river near Koliad and Vengani villages, ATP, GIDC asked MM to send GIDC the area map with reference to the HTL
	c	MM and ATP, GIDC discussed on the extent of depiction of land use and infrastructure including the State Highway passing through in the already existing

Record of meeting/discussion

Continuation sheet



Project No.

Date of Meeting

Item	Text	Action on
d	<p>GIDC estates to be given in the proposed land use map. MM is of the opinion that in order to avoid any confusion only the roads and utility relates aspects to be shown in detail and the rest to be shown as the particular existing industrial estate.</p> <p>ATP, GIDC suggested that VC&MD can take a call on all above issues mentioned in 3.b – 3.c</p>	<p>GIDC, MM</p>

Record of meeting/discussion



Project Title Draft Development Plan of Gujarat PCPIR

Division IWU, Ahmedabad

Subject PCPIR area Planning.

Project No. 266571

Location Gujarat Industrial Development Corporation, Udhyog Bhavan, Block no. 4, 2nd Floor, Sector 11, Gandhinagar - 3820017

Date of Meeting 30-09-2010

Time 11.00 to 14.30

Present

Client : GIDC

Consultant :Mott MacDonald

Mr. Patel (CE)

Mr. B. Jain (DCE)

Pradeep Kumar(PM)

Ajay Rana

Mr. K A Patel(SE)

Mr. Makwana

Bhargav Joshi

Yogesh Chalke

Karthick Ramu

Recorded by		Distribution
Ajay Rana		GIDC, PK,AR,BJ,YC,KR

Item	Text	Action on
	Following Points are discussed regarding Planning for PCPIR area.	
1	WS	
1.1	Demand Cross check with GPCPIR services & CPHEEO Norms.	MM & GPCPIR Services Ltd.
1.2	Area wise water consumption to be concluded (KI/Ha) based on demand projection & land use pattern.	
2	Effluent	
2.1	Proposed 90MLD effluent disposal line by GIDC has not been finalised yet, so MM should plan proposed effluent line considering existing 90MLD disposal line only & suggest further projection & planning alignment.	MM
2.2	Revision of Effluent plan based on WS demand updates.	MM
3	Sewerage	
3.1	Revision of Sewerage plan based on WS demand updates.	MM
3.2	Recycle concept should be considered while planning.	MM
4	Road	
4.1	Alignment of Non Processing zone should be planned on existing alignment as much as possible & discuss superimposing of existing alignment on proposed with GIDC for finalisation.	MM

Record of meeting/discussion

Continuation sheet



Project No. 266571

Date of Meeting 30.09.2010

Item	Text	Action on
5	Storm Water Drainage	
5.1	Should be aligned along with proposed road updation & existing village road where ever feasible.	MM
6	Solid Waste Management.	
6.1	Existing industrial solid waste to be checked with GEPIL, GPCB & BEIL.	MM
7	Power	
7.1	Power Plan to be discussed with MM Electrical Planner with GIDC SE Electrical & Mechanical.	MM

Record of meeting/discussion



Project Title DDP of Gujarat PCPIR

Division MCD-ISA

Subject DDP, GPCPIR

Project No. 245268AA01

Location Gandhinagar, Ahmedabad

Date of Meeting 1st Oct 2010

Present Mr Agarwal,	VC&MD, GIDC	Madhurima Waghmare	Sr Consultant and Project Manager DDP, Mott MacDonald
Mr Nayan Rawal	Advisor (Proj), GIDC	Ajay Rana	Engineer, Civil, Mott MacDonald
Mr Bhowmik	Advisor (TP), GIDC	Bhargav Joshi	Engineer, Environment, Mott MacDonald
Mr Patel	CE, GIDC		
Mr Prashant Bhatt	Manager-Land, GIDC		
Mrs Alka Badlani	ATP, GIDC		
Mr Bharat Jain	Dy CE, Cleaner Productions, Environmental cell, GIDC		
Mr Ashok Nakum	Asst Manager, GIDC		
GIDC (Proj & TP) GIDC Team Members			

Recorded by
Madhurima Waghmare

Distribution
Internal

Item	Text	Action on
1	This was a summing up meeting on the status of Draft Development Plan and also in order to seek the comments of GIDC on the DDP Proposal as submitted in the Interim Report-2 so that the project can be taken ahead as earliest possible	
2	VC&MD discussed the points referred in the earlier meeting with the CS. Key points are listed one by one as follows:	GIDC & MM
a	On consideration of expansion of Bharuch-Dahej SH in DDP	MM has already included the same in the Proposed DDP
b	Railway siding required by industries in Dahej I	Since the siding will be included in the existing Dahej Estate and will require detailed alignment surveys which are not in the preview

Record of meeting/discussion

Continuation sheet



Project No.

Date of Meeting

Item	Text	Action on
		of the DDP, it cannot be specifically shown in the DDP
c	There is a ferry service proposed near village Luvara in Dahej 1. The specific point has been identified by GMB for the same which can be shown specifically in the DDP if relevant	MM
D	VC&MD enquired about the provision of Airstrip for GCPPIR area	MM has indicated the possible location outside GPCPIR also discussed the same and the available sites with the Director, Civil Aviation
E	Proposed tentative alignment of Kalpasar Diversion canal passing through the GPCPIR area	MM has included the same in Proposed DDP
3 Buffer areas	a	VC&MD suggested to remove the 100 no development zone in Gamtal buffer area as it is practically not feasible to implement it and force the landowners in that area for the same. The same should be included in the GDCRs for the development of the adjoining land use and appropriately mentioned in various sections of the GDCRs to be followed while the area is taken up for development
	b	Similarly, VC&MD suggested to remove the 100, 50, 25 m wide industrial buffer area shown in the proposed land use plan. Instead this should be included in the GDCRs for GPCPIR area to be followed when the area is taken up for development by any implementing agency.
4- GIDC Phases		MM indicated that the GIDC phases (Dahej phase 4 and Vilayet expansion) should be modified as per the proposed land use plan. VC&MD was agreeable to this and directed the relevant department for the same
5 logistic s area near Vilayet		VC&MD suggested to shift the logistics area to the south of the institutional area falling in proposed Vilayet expansion area since it was very close to the residential area in the proposed land use plan

Record of meeting/discussion

Continuation sheet



Project No.

Date of Meeting

Item	Text	Action on
estate		
6	MM informed that as indicated by GIDC the format for the final report and maps submission and the GDCRs is being done in consultation with Advisor (TP). Advisor (TP) also discussed that there is also a working group formed for the GDCRs of GPCPIR and will be meeting to discuss and finalise the GDCRs	MM, GIDC
7	CE, GIDC discussed on the issue of the difference in water demand calculation for the GPCPIR area and suggested some modifications if possible in the road planning. However, in light of the face that the GPCPIR area is a dynamic activity and it is not feasible to incorporate dynamic changes, VC&MD suggested MM to go ahead in terms of the final presentation to the RDA as earliest possible mainly on the basis of the DDP proposal.	
8	After the meeting, further to the discussion with Advisor (Proj) and Advisor (TP), it was discussed that in light of the fact that all the members of the GDCRs working group have to come together as per convenient time & the upcoming festivals in this month, MM will seek an appointment for the final presentation of this assignment to the RDA for end of this month or start of November, 2010 as available and suitable	MM, GIDC

Appendix J. CRZ notification: list of petroleum products permitted

CRZ Notification

ANNEXURE III

[See Paragraph 2, sub-paragraph (ii)]

List of Petroleum Products Permitted for Storage in Port Areas

- i. Crude Oil;
- ii. Liquified Petroleum Gas;
- iii. Motor Spirit;
- iv. Kerosene;
- v. Aviation Fuel;
- vi. High Speed Diesel;
- vii. Lubricating Oil;
- viii. Butane;
- ix. Propane;
- x. Compressed Natural Gas;
- xi. Naptha;
- xii. Furnace Oil;
- xiii. Low Sulphur Heavy Stock".