पेट्रोलियम एवं
प्राकृतिक गैस मंत्रालय
MINISTRY OF
PETROLEUM AND NATURAL GAS

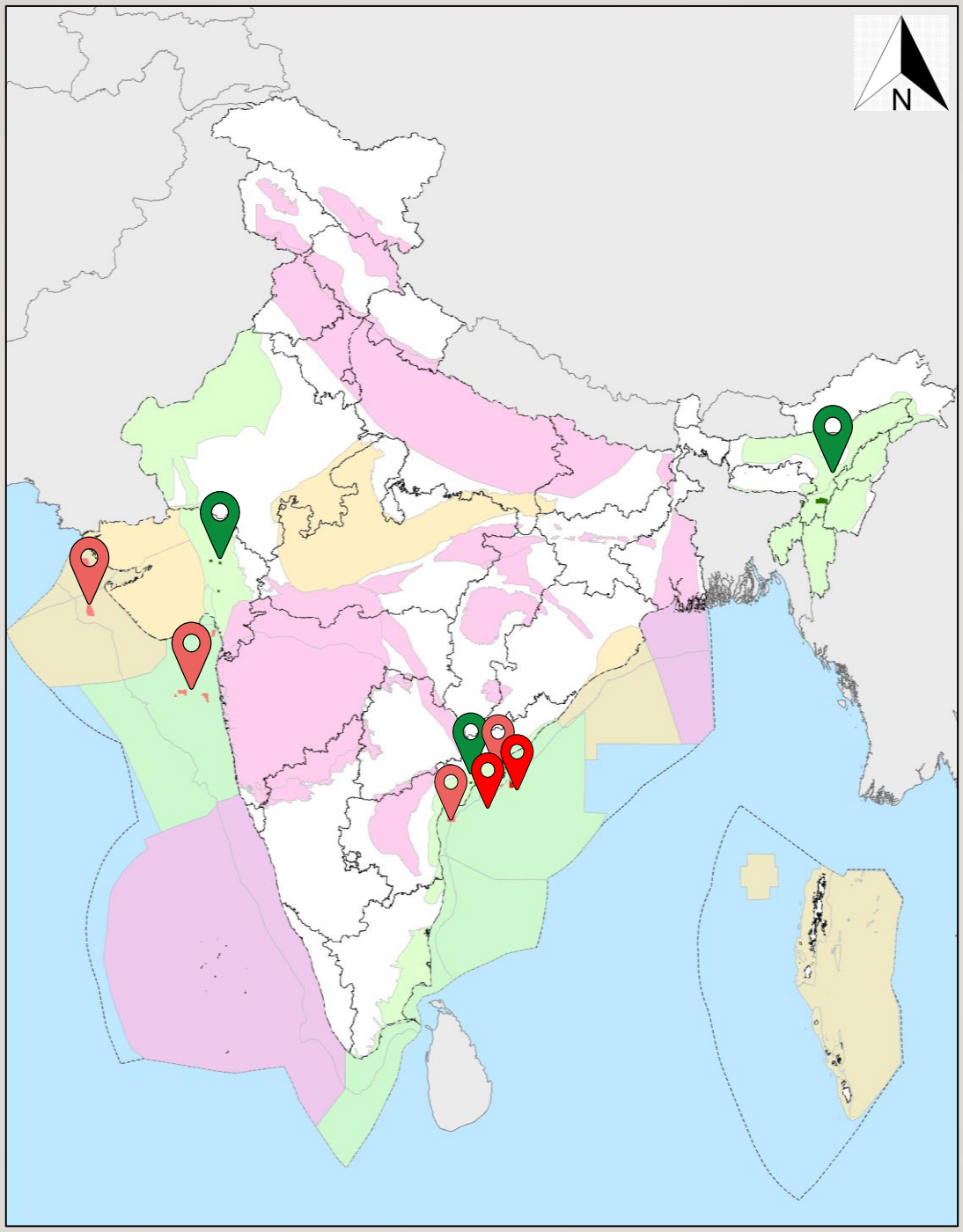
सत्यमेव जयते

DGH

DIRECTORATE GENERAL OF HYDROCARBONS

(Ministry of Petroleum & Natural Gas,Government of India)

INFORMATION DOCKET



CONTRACT AREA

CB/ONDSF/CAMBAY ONLAND/2025

DISCOVERED SMALL FIELD BID ROUND - IV

DISCLAIMER

This document, titled Information Docket, provides a consolidated overview of the Contract Area comprising the discoveries/fields offered under the Discovered Small Fields (DSF) Bid Round-IV. This docket has been prepared based on original inputs /information received from National Oil Companies, Private Operators/JV and available at National Data Repository (NDR).

Third Parties were engaged to independently assess the information and estimate the in-place volumes. In conducting these estimations, Third Parties used the available data/information and employed assumptions, procedures and methods deemed necessary given the timeframe available for evaluation.

The accuracy and clarity of the information presented herein, including the reported hydrocarbon resources, are thus limited to the data available at the time of analysis and the verifications performed by the Third Parties during the evaluation timeframe. The findings are subject to further review and validation by bidders upon receipt of additional and clarified data/information.

Given these limitations, all bidders are hereby advised to undertake their own independent technical and commercial due diligence and conduct thorough evaluations of the data and resource potential to support informed investment and bidding decisions.

Contents

INTRODUCTION

With the extension of the DSF policy 2015, DSF Bid Round IV offers 55 small-to-mid-size oil and gas discoveries through international competitive bidding. There are 9 contract areas under DSF-IV spread over Cambay, Assam & Arakan, Gulf of Kutch, Mumbai Offshore and Krishna Godavari Basins. Out of 55 discoveries, there are 19 onshore discoveries in 3 contract areas, 26 shallow water discoveries in four contract areas and 10 Deepwater discoveries in two contract area. The discoveries have been suitably clustered in order to leverage shared resources and operational flexibility.

In terms of hydrocarbon prospectivity, the fields-on-offer lie in 5 sedimentary basins which include 8 Contract areas in Category I basins with hydrocarbon reserves and 1 Contract area in Category II basins with contingent resources.

Each contract area on offer has multiple discoveries, comprehensively described in this Information Docket to bring in all relevant subsurface facts of geo-scientific and engineering information. This technical booklet will be useful if read while working with the Data Package which would be available on sale once the Data Room is set up for viewing.

1. CONTRACT AREA DESCRIPTION

The contract area, designated as CB/ONDSF/CAMBAY ONLAND/2025, is situated onshore within the Cambay Basin and spans an area of 110.479 sq. km, offered under DSF Bid Round IV. It comprises three separate polygons within the contract boundary, encompassing four discoveries/fields—PASUNIA-1, PASUNIA-2, OGNJ-1, and UBER-2—along with 11 additional wells. In the map attached to the Notice Inviting Offer (NIO) document, this contract area is labeled as O-2.

Table 1-1: Details of Contract Area CB/ONDSF/CAMBAY ONLAND/2025

Details of Contract Area CB/ONDSF/CAMBAY ONLAND/2025

Total Contract Area : **110.48** SqKm
No. of Discovery Wells in Contract Area : **4**
Total No. of Wells in Contract Area : **15** (including Discovery wells)
Polygons Covered in Contract Area : **3**

S. No.	Name of Polygon	Contract Area, SqKm	No. of Discovery Wells	Total No. of Wells	O+OEG (2P) MMTOE	O+OEG, (As per Erstwhile Operator) MMTOE
1	PASUNIA (PASUNIA-1, PASUNIA-2	40.76	2	6	0.30	0.12
					0.26	0.05
2	OGNAJ-1	44.34	1	4	0.15	0.11
3	UBER-2	25.38	1	5	0.22	0.20
Total		**110.48**	**4**	**15**	**0.93**	**0.48**

The following **Figure 1-1** and **Figure 1-2** illustrate the layout and details of the contract area across the respective fields and/or clusters.

Figure 1-1: Layout of CB/ONDSF/CAMBAY ONLAND/2025 Contract Area

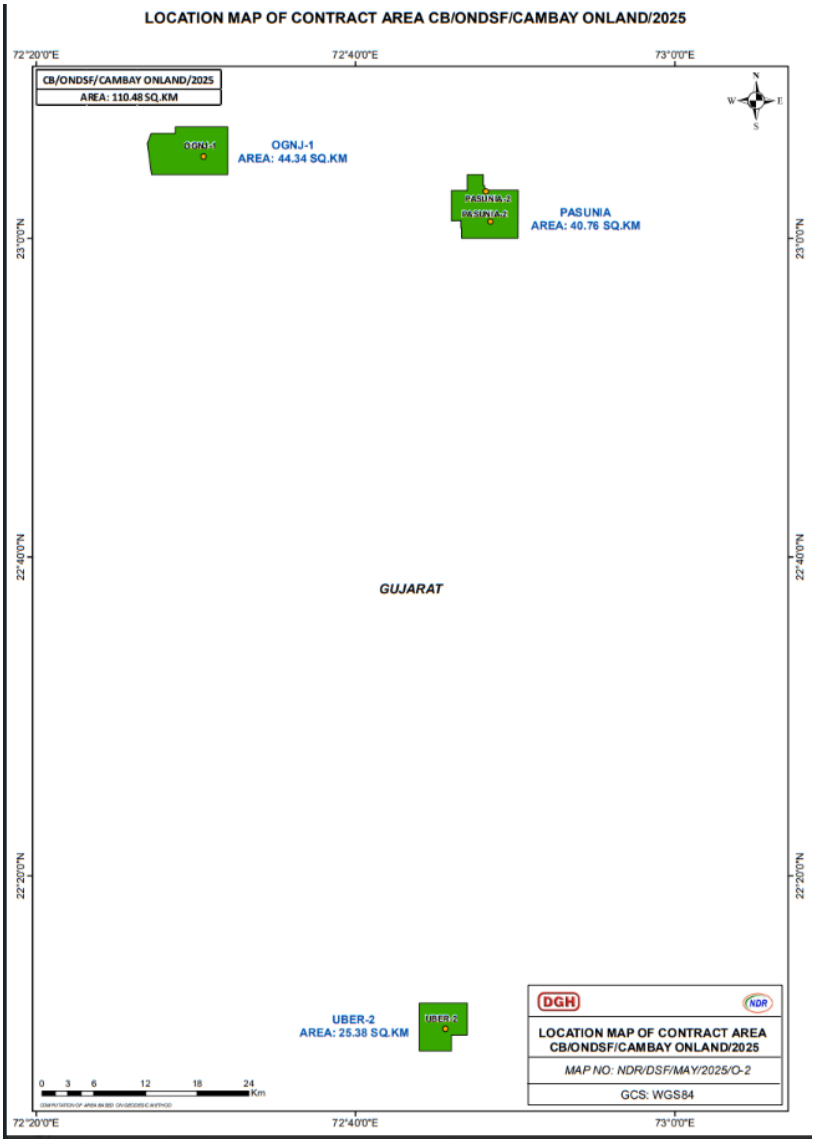
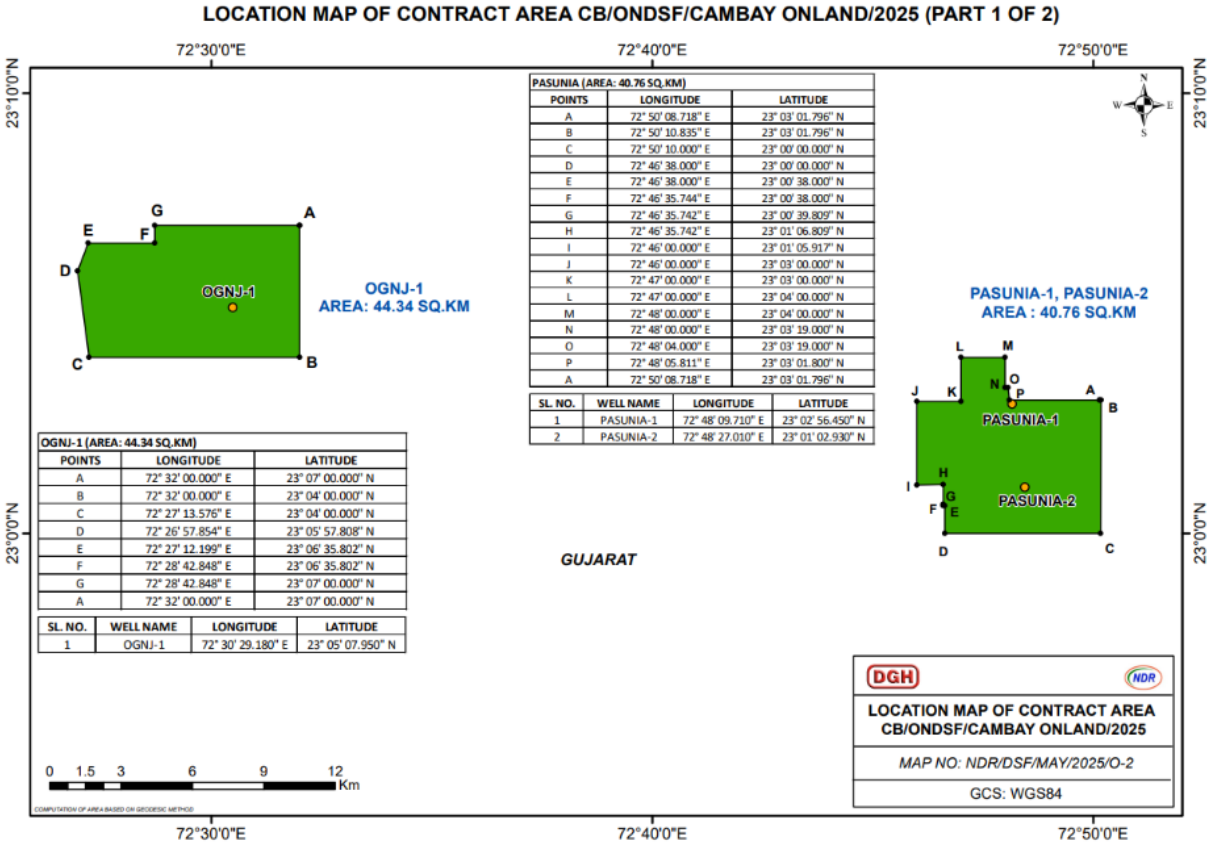


Figure 1-2: Details of CB/ONDSF/CAMBAY ONLAND/2025 Contract Area



PASUNIA (AREA: 40.76 SQ.KM)

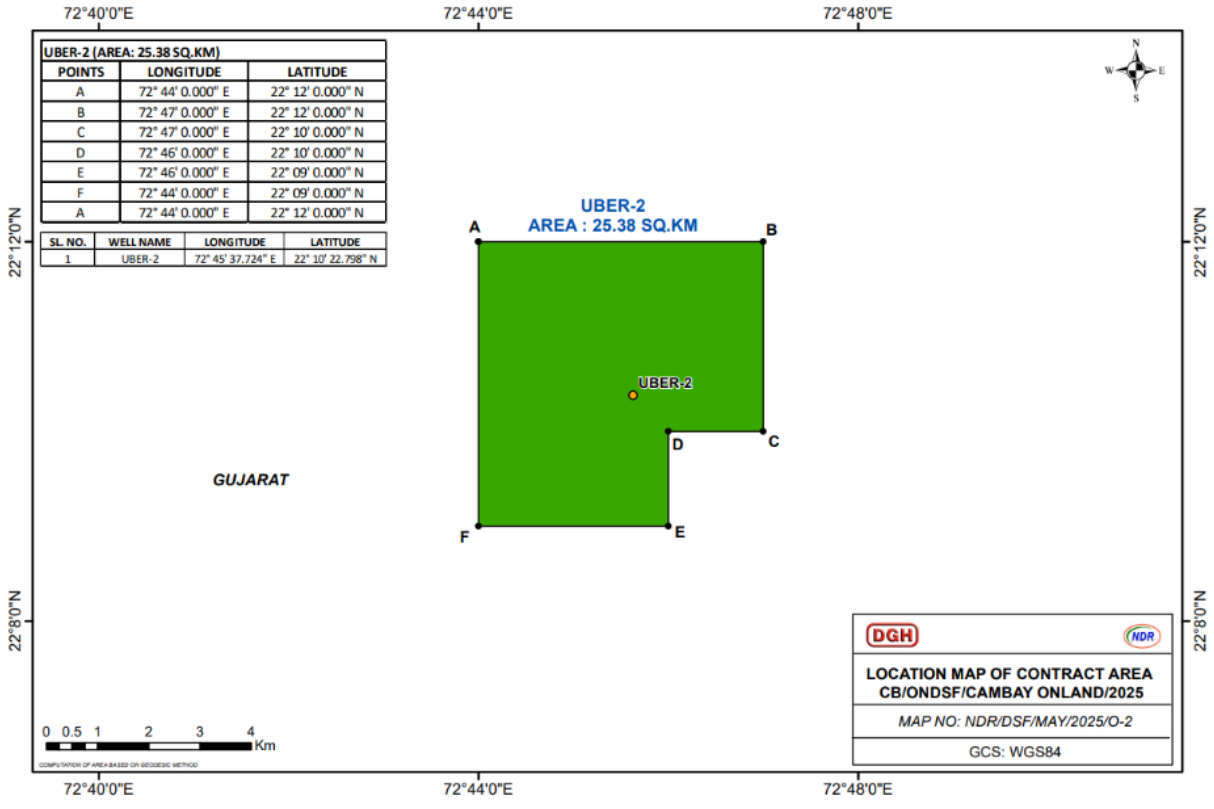
POINTS	LONGITUDE	LATITUDE
A	72° 50' 08.718" E	23° 03' 01.796" N
B	72° 50' 10.835" E	23° 03' 01.796" N
C	72° 50' 10.000" E	23° 00' 00.000" N
D	72° 46' 38.000" E	23° 00' 00.000" N
E	72° 46' 38.000" E	23° 00' 38.000" N
F	72° 46' 35.744" E	23° 00' 38.000" N
G	72° 46' 35.742" E	23° 00' 39.809" N
H	72° 46' 35.742" E	23° 01' 06.809" N
I	72° 46' 00.000" E	23° 01' 05.917" N
J	72° 46' 00.000" E	23° 03' 00.000" N
K	72° 47' 00.000" E	23° 03' 00.000" N
L	72° 47' 00.000" E	23° 04' 00.000" N
M	72° 48' 00.000" E	23° 04' 00.000" N
N	72° 48' 00.000" E	23° 03' 19.000" N
O	72° 48' 04.000" E	23° 03' 19.000" N
P	72° 48' 05.811" E	23° 03' 01.800" N
A	72° 50' 08.718" E	23° 03' 01.796" N

SL. NO.	WELL NAME	LONGITUDE	LATITUDE
1	PASUNIA-1	72° 48' 09.710" E	23° 02' 56.450" N
2	PASUNIA-2	72° 48' 27.010" E	23° 01' 02.930" N

OGNJ-1 (AREA: 44.34 SQ.KM)

POINTS	LONGITUDE	LATITUDE
A	72° 32' 00.000" E	23° 07' 00.000" N
B	72° 32' 00.000" E	23° 04' 00.000" N
C	72° 27' 13.576" E	23° 04' 00.000" N
D	72° 26' 57.854" E	23° 05' 57.808" N
E	72° 27' 12.199" E	23° 06' 35.802" N
F	72° 28' 42.848" E	23° 06' 35.802" N
G	72° 28' 42.848" E	23° 07' 00.000" N
A	72° 32' 00.000" E	23° 07' 00.000" N

SL. NO.	WELL NAME	LONGITUDE	LATITUDE
1	OGNJ-1	72° 30' 29.180" E	23° 05' 07.950" N



UBER-2 (AREA: 25.38 SQ.KM)

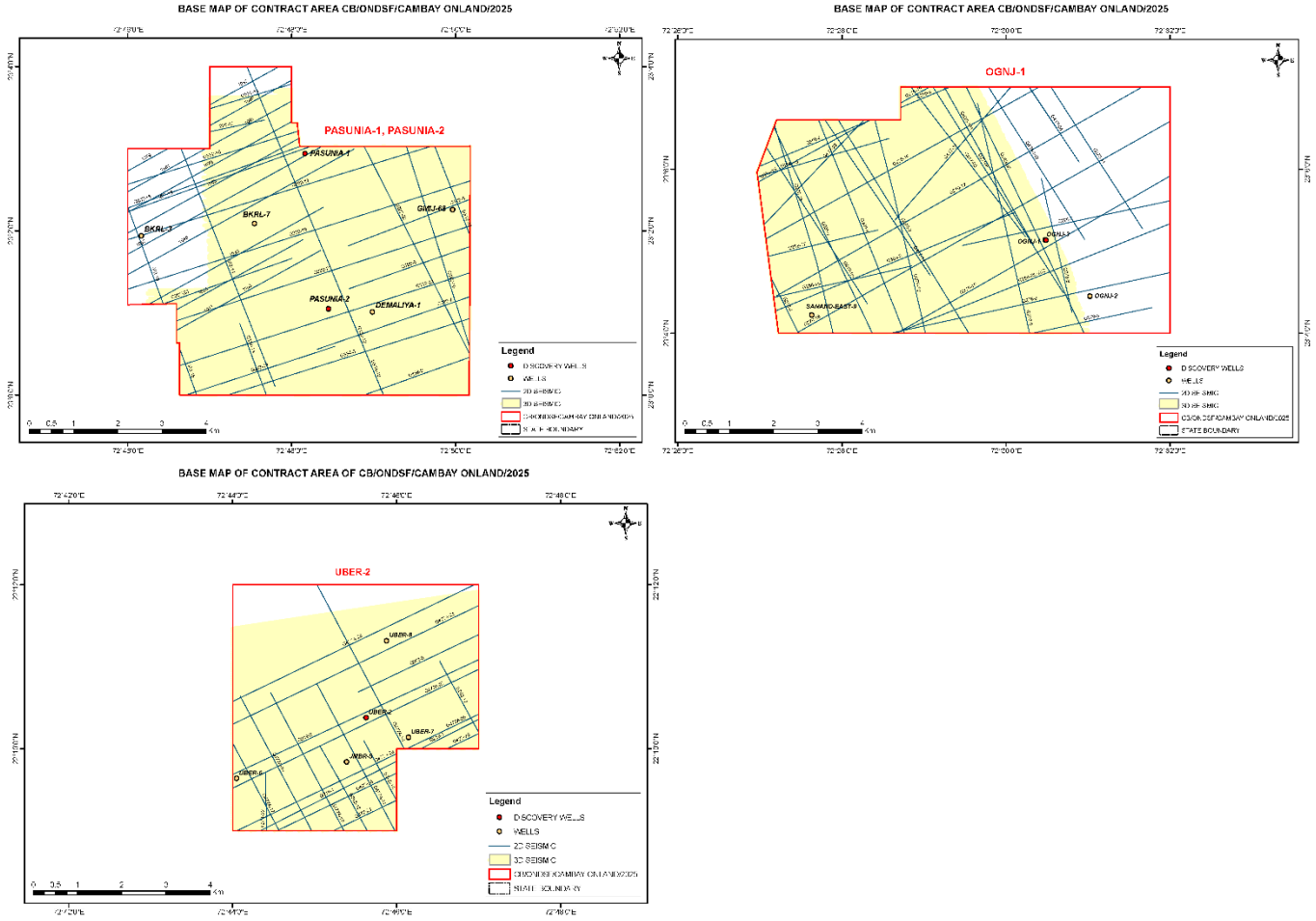
POINTS	LONGITUDE	LATITUDE
A	72° 44' 0.000" E	22° 12' 0.000" N
B	72° 47' 0.000" E	22° 12' 0.000" N
C	72° 47' 0.000" E	22° 10' 0.000" N
D	72° 46' 0.000" E	22° 10' 0.000" N
E	72° 46' 0.000" E	22° 09' 0.000" N
F	72° 44' 0.000" E	22° 09' 0.000" N
A	72° 44' 0.000" E	22° 12' 0.000" N

SL. NO.	WELL NAME	LONGITUDE	LATITUDE
1	UBER-2	72° 45' 37.724" E	22° 10' 22.798" N

The area includes data from 356.13-line kilometers of 2D seismic surveys and 85.39 square kilometers of

3D seismic coverage. A total of 15 wells have been drilled within the contract area. The following **Figure 1-3** depicts the extent of the available 2D and 3D seismic data, along with the locations of wells drilled across the respective field(s) and/or cluster(s).

Figure 1-3: Seismic- and well data coverage in CB/ONDSF/CAMBAY ONLAND/2025 Contract Area



2. PHYSIOGRAPHY AND ACCESSIBILITY OF THE AREA

The Cambay Basin is one of the most significant petroleum-bearing basins in India. Located in the western part of the country (**Figure 2-1**), this peri-cratonic rift basin is primarily situated in the state of Gujarat. It has been a focal point for hydrocarbon exploration and production due to its favorable geological setting and sedimentary history.

The Cambay Basin extends in a north-south direction between the Aravalli ranges in the northeast and the Saurashtra Peninsula in the southwest. It is a narrow, elongated basin bounded by major tectonic features. Physio-graphically, it can be divided into the following sub-regions:

Northern Cambay Basin: This area lies near Mehsana and Ahmedabad and is relatively flat with low-lying plains. It is characterized by Quaternary alluvial deposits.

Central Cambay Basin: Located around the Baroda (Vadodara) region, this part of the basin shows slightly undulating terrain with some uplifted fault blocks and isolated hills.

Southern Cambay Basin: Extending towards the Gulf of Khambhat, this region includes coastal plains, tidal flats, and estuarine features. The southern section merges into the offshore zone.

Geologically, the basin is filled with Tertiary and Quaternary sediments overlying Precambrian basement rocks. Rift structures, fault systems, and tilted fault blocks are characteristic features that influence both topography and subsurface geology.

The Sabarmati, Mahi, and Narmada rivers traverse or border the Cambay Basin, contributing to its sedimentary fill and shaping the surface morphology. These rivers have developed extensive floodplains and alluvial fans, particularly in the northern and central parts of the basin. The terrain, therefore, consists mainly of alluvial tracts, marshy lands, and coastal sediments in the south.

The Cambay Basin's physiography—comprising flat alluvial plains, rift structures, and coastal margins—has played a pivotal role in its evolution as a petroleum-rich area. Its excellent accessibility through well-developed infrastructure supports extensive exploration and production activities. As India continues to enhance its energy security, the Cambay Basin remains a cornerstone of onshore hydrocarbon resources.

The Cambay Basin is highly accessible due to its location in one of India's more developed and industrialized states—Gujarat. Accessibility can be considered in terms of infrastructure, transportation, and connectivity:

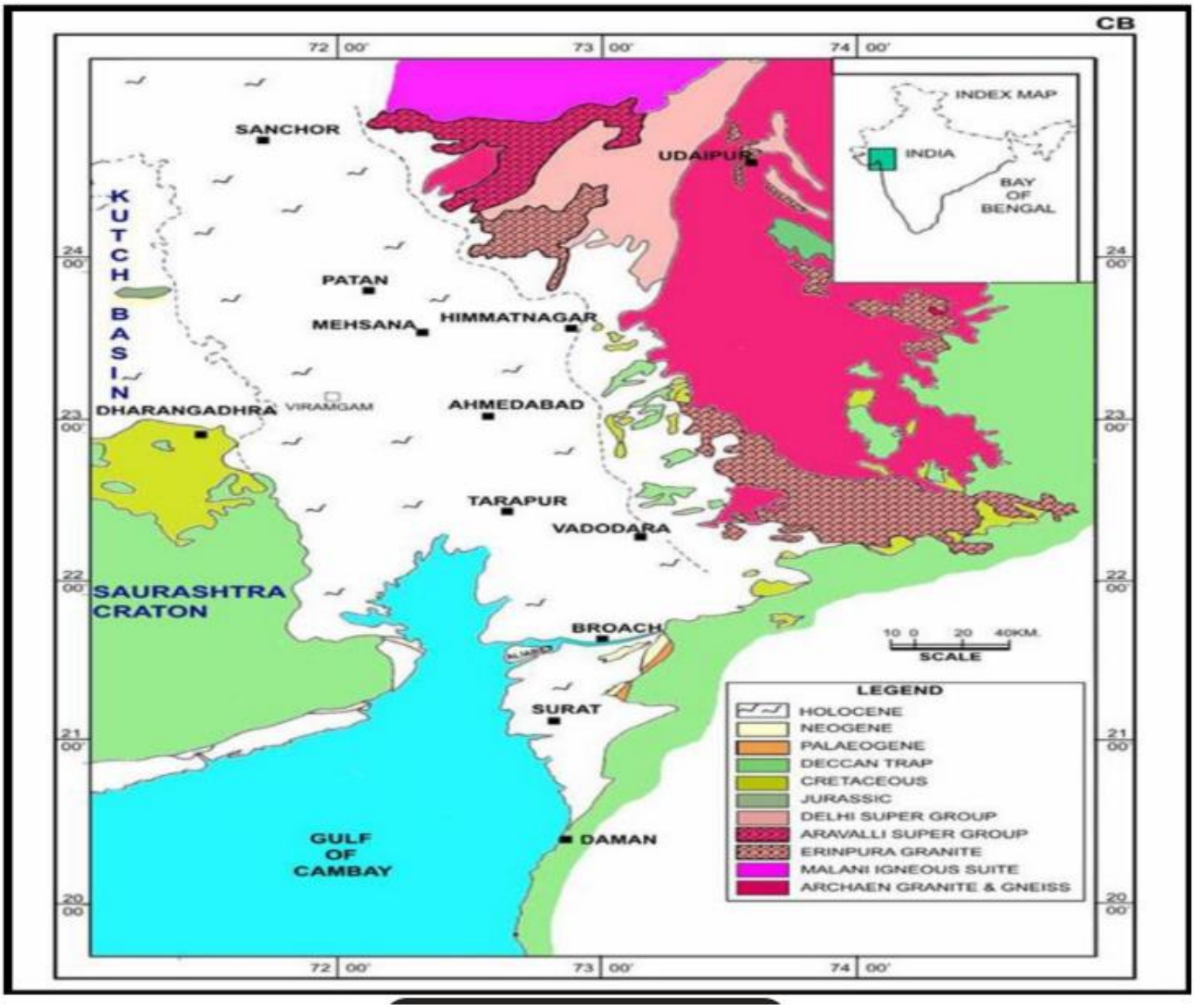
Road and Rail Networks: The basin is well-served by an extensive network of national highways and state highways. Railways connect key towns like Ahmedabad, Vadodara, Mehsana, and Bharuch, which lie within or near the basin.

Air Connectivity: Major airports in Ahmedabad and Vadodara provide domestic and international connectivity. Smaller airstrips are available for regional travel and industrial use.

Ports and Waterways: The proximity to the Gulf of Khambhat enables access to several ports, including Dahej, Hazira, and Kandla. These are crucial for the transport of industrial equipment and crude oil.

Industrial and Pipeline Infrastructure: The region is home to several refineries, petrochemical complexes, and pipelines operated by ONGC and other private companies, making it one of the most strategically developed hydrocarbon zones in India.

Figure 2-1: Location of Cambay Basin in India



Location of the basin and satellite imagery of the fields on offer is shown in **Figure 2-2**

Figure 2-2:Satellite imagery of the Contract Area

3. RELEVANT SEDIMENTARY BASIN INFORMATION

3.1 CAMBAY ONLAND (CB) BASIN DESCRIPTION

The Cambay Basin is classified as a Category I basin, indicating a substantial volume of discovered in-place hydrocarbons with strong commercial potential for optimal production. The basin's onshore sub-basin extends across parts of Gujarat and Rajasthan.

Geologically, Cambay is primarily composed of siliciclastic rift-fill sediments and is located in the western part of the Indian peninsula. It is considered one of India’s most mature petroleum provinces, with several major producing fields. To date, approximately 88% of the total estimated hydrocarbon resources in the basin have already been discovered.

Despite extensive exploitation, the Cambay Basin remains a focus for active exploration, particularly targeting deeper and underexplored plays. Hydrocarbon occurrences have been found across a wide range of stratigraphic intervals, from the Cretaceous–Paleocene Deccan Trap volcanics to Miocene sediments. Discoveries have been made in structural, stratigraphic, and strati-structural traps, with around two-thirds of these in the Middle Eocene.

The basin features a thick sequence of Tertiary sediments (Paleocene to Recent) overlying the Deccan Trap. The Paleocene-aged Cambay Shale serves as the primary source rock, charging the Middle Eocene Kalol (northern and central) and Hazad (southern deltaic) reservoirs. The Tarapur Formation (Oligocene) acts as an effective regional cap rock. In subsequent exploration phases, the Miocene-aged Babaguru Formation has been proven to be a promising reservoir unit in the southern onshore area and its offshore extension into the Gulf of Cambay.

Tectonically, Cambay is a peri-cratonic rift basin influenced by inversion tectonics associated with the Himalayan Orogeny. The basin spans an area of 53,500 square kilometers, comprising 48,882 sq. km of onland and 4,618 sq. km of shallow offshore area. Within this basin, seven hydrocarbon plays have been identified across the Basement, Paleocene, Eocene, and Miocene formations.

3.2 BASIN PROSPECTIVITY

The Cambay Basin hosts a total o**f** seven identified petroleum plays distributed across key geological intervals—Basement, Paleocene, Eocene, and Miocene. These plays are associated with diverse trap mechanisms and reservoir characteristics. A detailed 3D petroleum system model has been constructed using an integrated suite of geological and geophysical enabling a more accurate assessment of migration pathways, trap integrity, source rock maturity, and reservoir effectiveness.

The basin contains an estimated 2,053 Million Metric Tonnes of Oil Equivalent (MMTOE**)** of hydrocarbon in-place resources. Out of this, approximately 1,800 MMTOE has already been discovered, encompassing both commercially viable accumulations and sub-commercial occurrences, reflecting the basin's mature exploration status.

The remaining 253 MMTOE**, or** approximately 12% of the total in-place volume, represents the yet-to-find potential, with significant opportunity for future exploration—particularly in deeper and less explored stratigraphic intervals and subtle trap settings.

Risked Undiscovered In-place Resource Potential by Play:

A stratified analysis of risked, undiscovered hydrocarbons in-place across different depositional systems and geological ages reveals the following distribution (**Table 3-1**):

Table 3-1: Cambay Basin Prospectivity

Stratigraphic Interval / Play	Undiscovered (Risked) In-place (MMTOE)
Cenozoic – Oligo-Miocene (Babaguru Fm.)	5
Cenozoic – Paleocene (Late)	28
Cenozoic – Paleocene (Early)	34
Cenozoic – Eocene (Early)	60
Cenozoic – Eocene (Middle)	96
Cenozoic – Eocene (Late)	11
Mesozoic – Cretaceous (Deccan Trap)	19

3.3 OPPORTUNITIES IN THE BASIN

As of March 31, 2024, The National Data Repository (NDR) has archived a comprehensive geoscientific database encompassing:

2D Seismic Data: 153,134 Line Kilometers (LKM)
3D Seismic Data: 49,689 Square Kilometers (SKM)
Wells: Data from 9,249 wells

These datasets form a critical foundation for ongoing and future basin evaluations.

Significant geophysical acquisition efforts have been undertaken across the onshore region under various Government of India initiatives. Notably, the National Seismic Programme **(NSP)** has contributed an additional 1,469 LKM of 2D seismic data, enhancing coverage in targeted areas to refine structural and stratigraphic interpretations.

3.3.1 Basin Appraisal and Active Acreage Distribution:

Cambay basin appraisal and active acreage distribution is given in **Table 3-2.**

Table 3-2: Basin Appraisal and Active Acreage Distribution

Location	Total Basin Area (SKM)	Appraised Area (SKM)	Percentage Appraised	Active Acreage (SKM) by Licensing Regime	Number of Fields
Onland	48,882	44,374	91%	Nomination: 6,008 NELP: 2,290 OALP: 9,803 DSF: 391	864
Shallow Water	4,618	4,618	100%	Nomination: 69 NELP: 4 OALP: 1,798 DSF: 424	16

3.3.2 Geological and Exploration Context:

The high appraisal percentages (91% onland and 100% shallow water) reflect the basin's mature exploration status. The extensive seismic and well data archive supports detailed subsurface modeling, resource estimation, and risk assessment across multiple play types.

The active acreage, segmented across nomination, NELP (New Exploration Licensing Policy), OALP (Open Acreage Licensing Policy), and DSF (Discovered Small Fields) regimes, underscores ongoing exploration and development activities.

In the following section, including **Figure 3-1** to **Figure 3-3** illustrate location of the basin, field or cluster of fields in the basin, generalized basin stratigraphy and tectonic framework of the basin.

Figure 3-1: Reference sedimentary basin

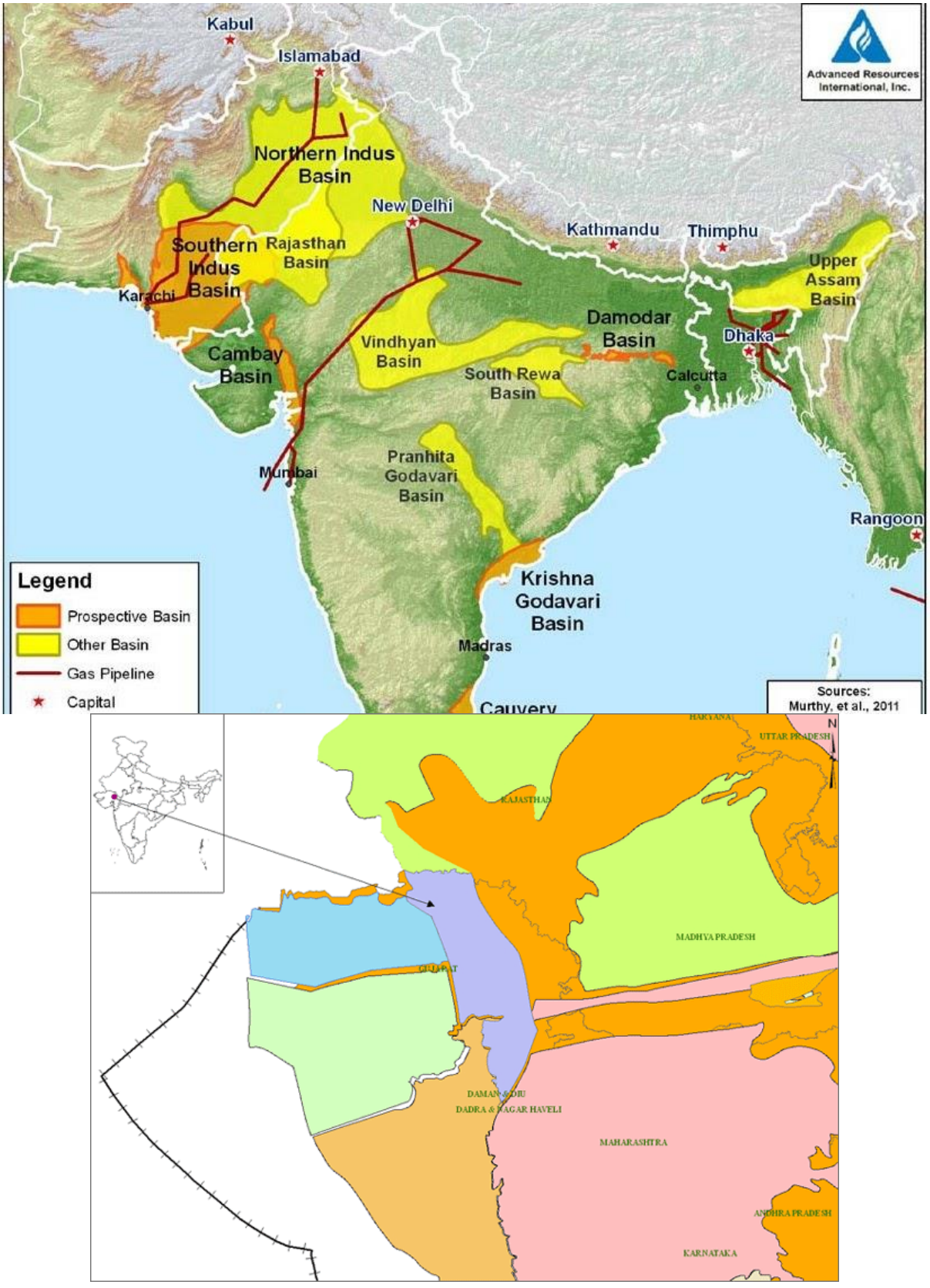


Figure 3-2: Generalized stratigraphy of the basin

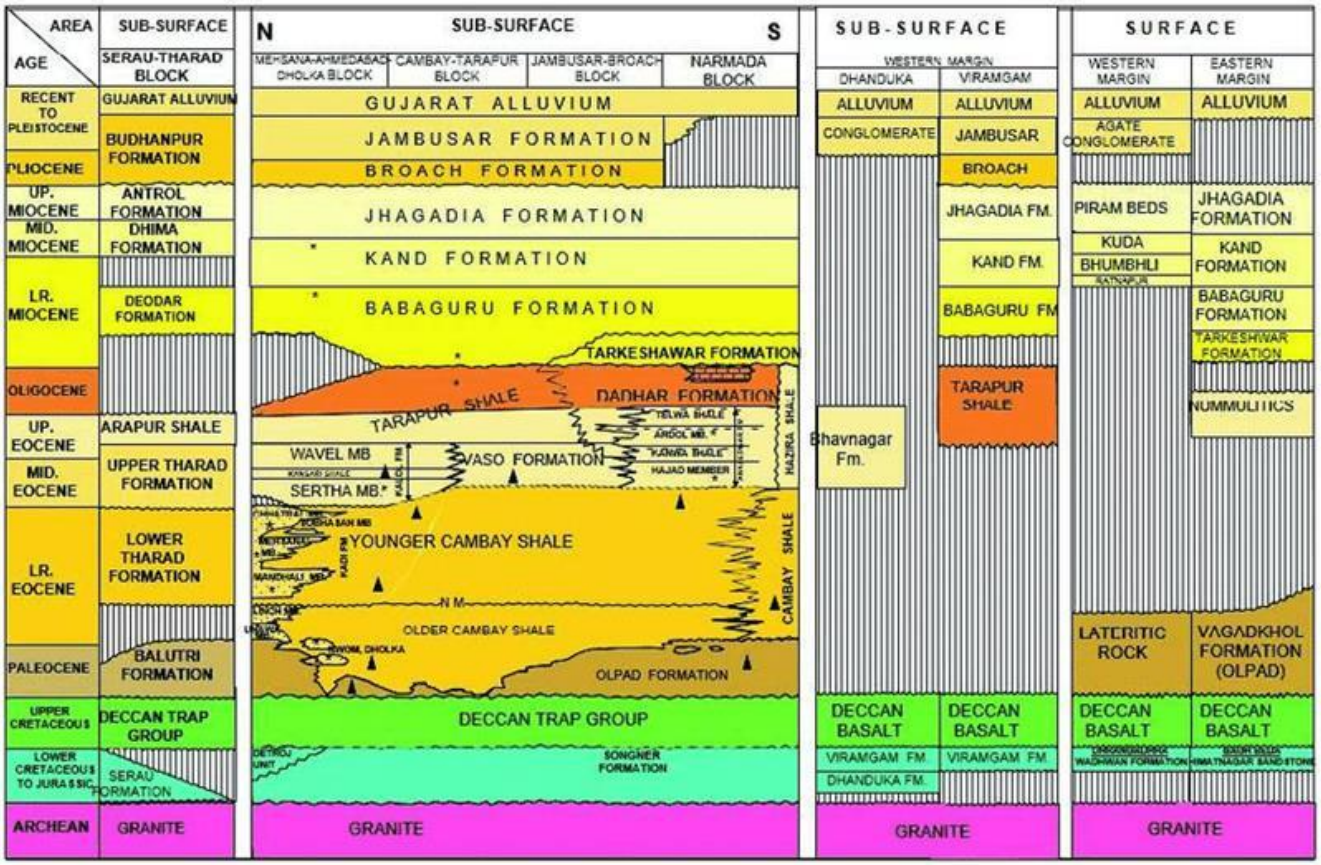
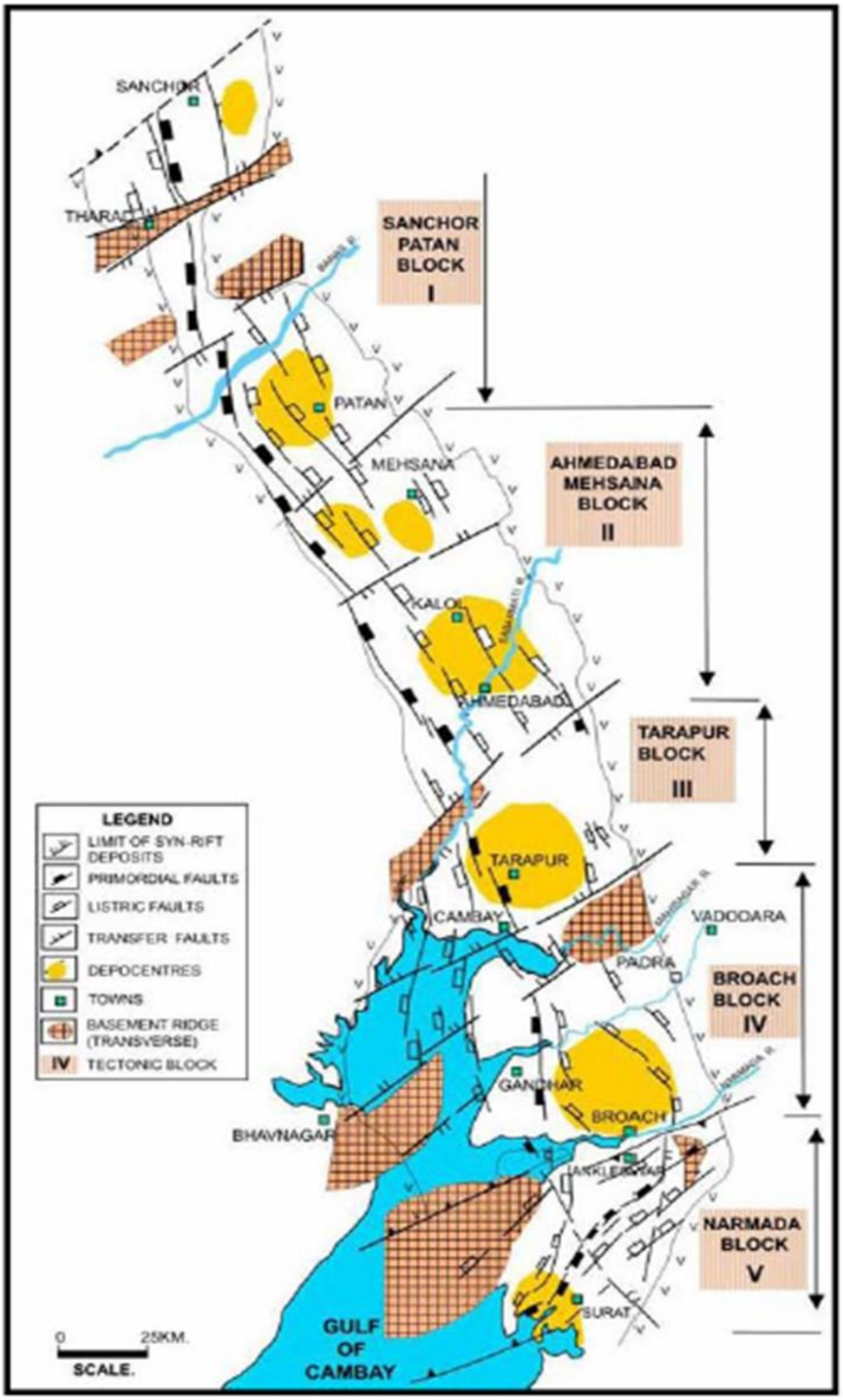


Figure 3-3: Tectonic map of the basin



4. DISCOVERY AND FIELD DESCRIPTION

The Information Docket is organized to provide a detailed description of each oil/gas discovery (i.e., field), along with other wells that have been drilled and/or tested within the contract area. It sequentially presents the available geoscientific and engineering data, including studies and interpretations. All subsurface and surface data—from drilling, logging, testing, and production—have been collated. Where available, reservoir studies are included with supporting data. Geological interpretations are effectively illustrated using correlations, sections, and maps to provide a clear subsurface depiction of the contract area. Finally, the report outlines the discovered hydrocarbon in place and, where applicable, recoverable contingent resources, including their estimated ranges and parameters.

To ensure continuity in understanding key topics such as drilling, logging, testing, reservoir studies, and geology, each field is presented in a domain-wise format. This approach allows for a comprehensive view of all wells and reservoirs associated with the field. For instance, in areas with multiple discoveries or fields, each discovery starts on a new page that outlines critical information related to drilling, logging, testing, and other subsurface details.

The focus is on presenting factual data, along with available interpretations and results. Figures and diagrams are widely used to illustrate and establish a preliminary understanding of the field and the associated data. As noted in the disclaimer, all information in this report has been provided by NOCs and contractors through their specific submissions.

CAMBAY ONSHORE PASUNIA BLOCK

4.1 DESCRIPTION OF CAMBAY ONSHORE PASUNIA BLOCK

The Pasunia Block consisting of two wells Pasunia-1 (PA#01) and Pasunia-2 (PA#02) is situated near the eastern rising margin of the Ahmedabad area. A part of the eastern rising margin lies within the eastern parts of the block. The Nardipur - Walod - Nenpur low passes along the western part of the block. In the western part the sediments dip with low angles towards the west, while in the eastern part the dips are higher. A ENE-WSW trending transverse fault separates the two portions of the block. Though no major longitudinal faults are present, several small-scale faults are present in both the syn-rift as well as the post-rift sections. Seismic imaging reveals possible Deccan Trap Basement to be present at depths of more than 4km. The sym-rift sediments are separated from the post-rift by seismically imaged unconformity. The Gamij field with listric fault lies to the east of the block. On the west, the Bakrol field is present, through which the western rising flank of the Nardipur - Walod - Nenpur low passes.

PA#01 and PA#02 discoveries are located in onland NELP-IX (2012 award) block CB-ONN-2010/8 towards Eastern margin of Ahmadabad - Mehsana tectonic block. Well Pasunia-1 (PA#01) was spudded on 28.01.2016 and drilled to a depth of 2043m. The main objective of drilling the well was to explore hydrocarbon prospectivity of Channel features identified at K-VIII level and secondary objectives at K-IX, Chhatral and Cambay Shale levels. Well Pasunia-2 (PA#02) was spudded on 10.04.2016 to a total depth of 2130m. Primary objective of this well was Channels at K-VIII level and secondary objectives were at K-IX (Channel), Chhatral and Cambay Shale levels.

The co-ordinates of the endpoints defining the cluster boundary are tabulated below in **Table 4-1.**
2D-3D seismic data coverage of the block is shown in **Figure 4-1.** Surrounding wells of this block are shown in **Figure 4-2**

Table 4-1: Endpoint coordinates outlining the cluster boundary

	PASUNIA Boundary Points		
	Area: 40.76 sq km		
	Point	**Longitude**	**Latitude**
	A	72°50’08.718” E	23°03’01.796” N
	B	72°50’10.835” E	23°03’01.796” N
	C	72°50’10.000” E	23°00’00.000” N
	D	72°46’38.000” E	23°00’00.000” N
	E	72°46’38.000” E	23°00’38.000” N
	F	72°46’35.744” E	23°00’38.000” N
	G	72°46’35.742” E	23°00’39.809” N
	H	72°46’35.742” E	23°01’06.809” N
	I	72°46’00.000” E	23°01’05.917” N
	J	72°46’00.000” E	23°03’00.000” N
	K	72°47’00.000” E	23°03’00.000” N
	L	72°47’00.000” E	23°04’00.000” N
	M	72°48’00.000” E	23°04’00.000” N
	N	72°48’00.000” E	23°03’19.000” N
	O	72°48’04.000” E	23°03’19.000” N

	P	72°48’05.811” E	23°03’01.800” N
	A	72°50’08.718” E	23°03’01.796” N
SL. No.	**Well**	**Longitude**	**Latitude**
1	PASUNIA-1	72°48’09.710” E	23°02’56.450” N
	PASUNIA-2	72°48’27.010” E	23°01’02.930” N

Figure 4-1: Seismic coverage in CB/ONDSF/CAMBAY ONLAND/2025 area

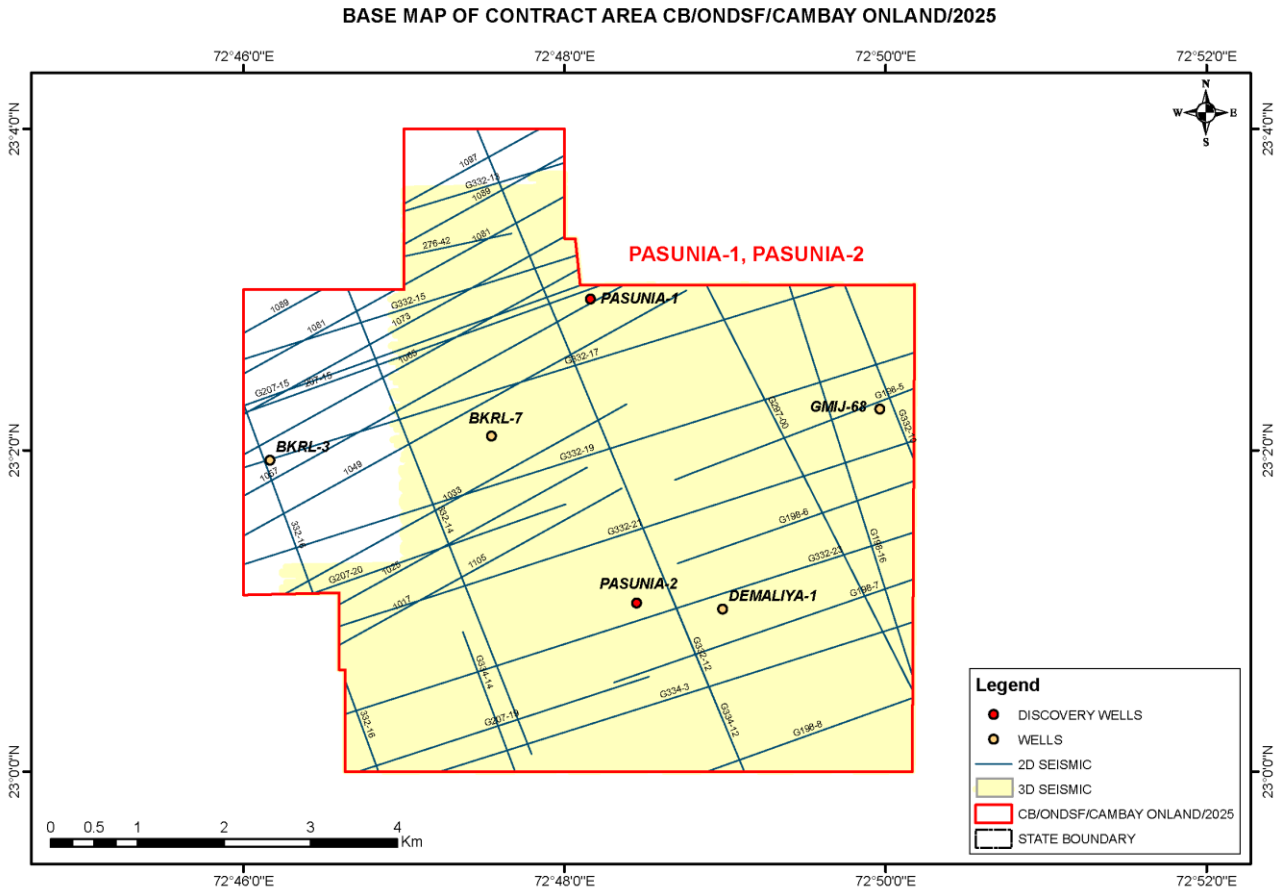
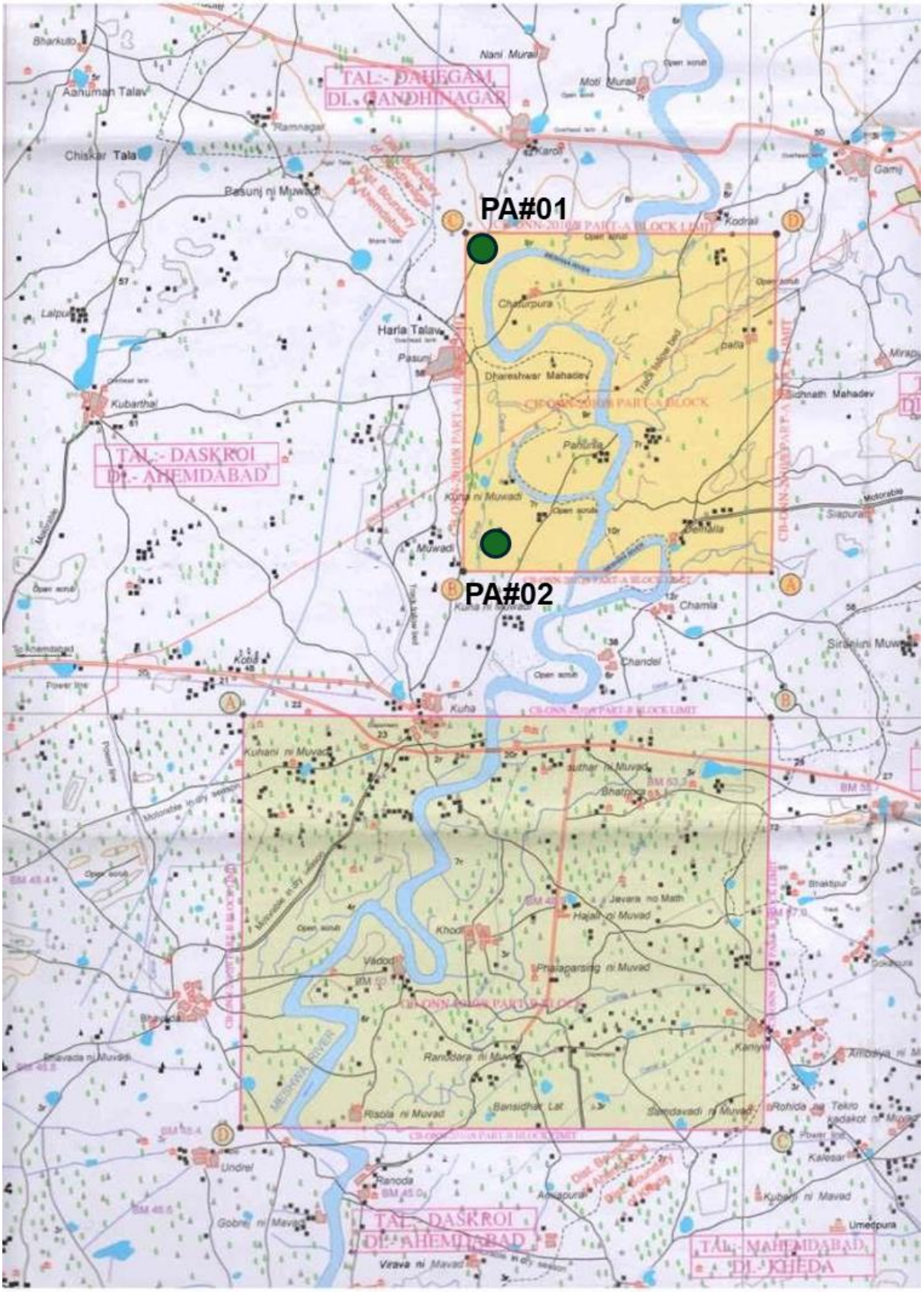


Figure 4-2:Surrounding oil and gas fields:



CAMBAY ONSHORE PASUNIA-1 (PA#01 FIELD

4.2 DESCRIPTION OF CAMBAY ONSHORE PASUNIA-1 (PA#01) FIELD

4.2.1 Drilling and well completion

Key information of drilled wells has been collated and presented hereunder. **Figure 4-3** and **Figure 4-4** illustrate the Well Construction Diagram and the Litho-column Information for key wells. Other well statics like kelly bush reference depth, water depth, drilled and logged depth including well coordinates are made available in Sections through various cross-references.

Figure 4-3:Well profile of PA#01

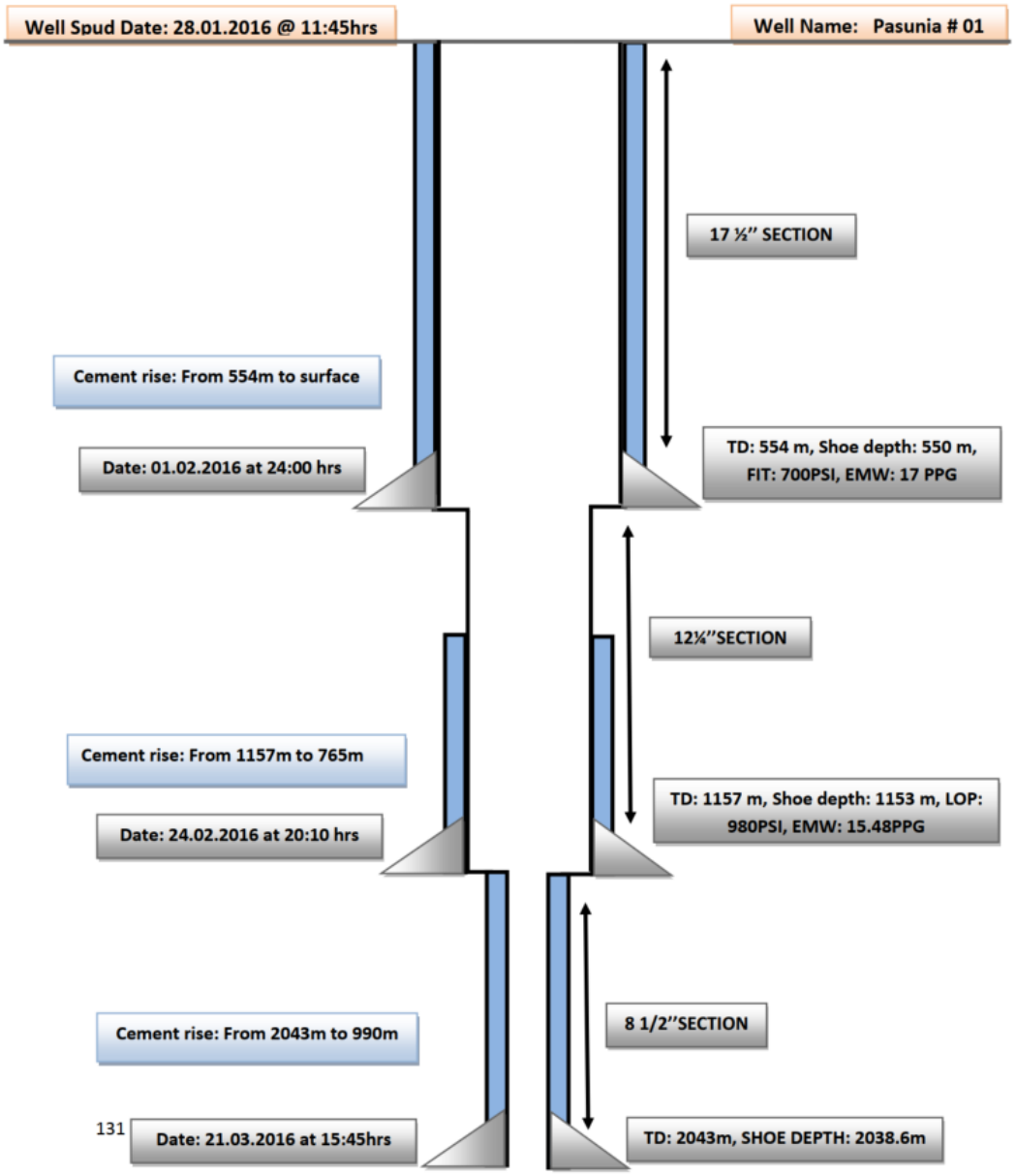
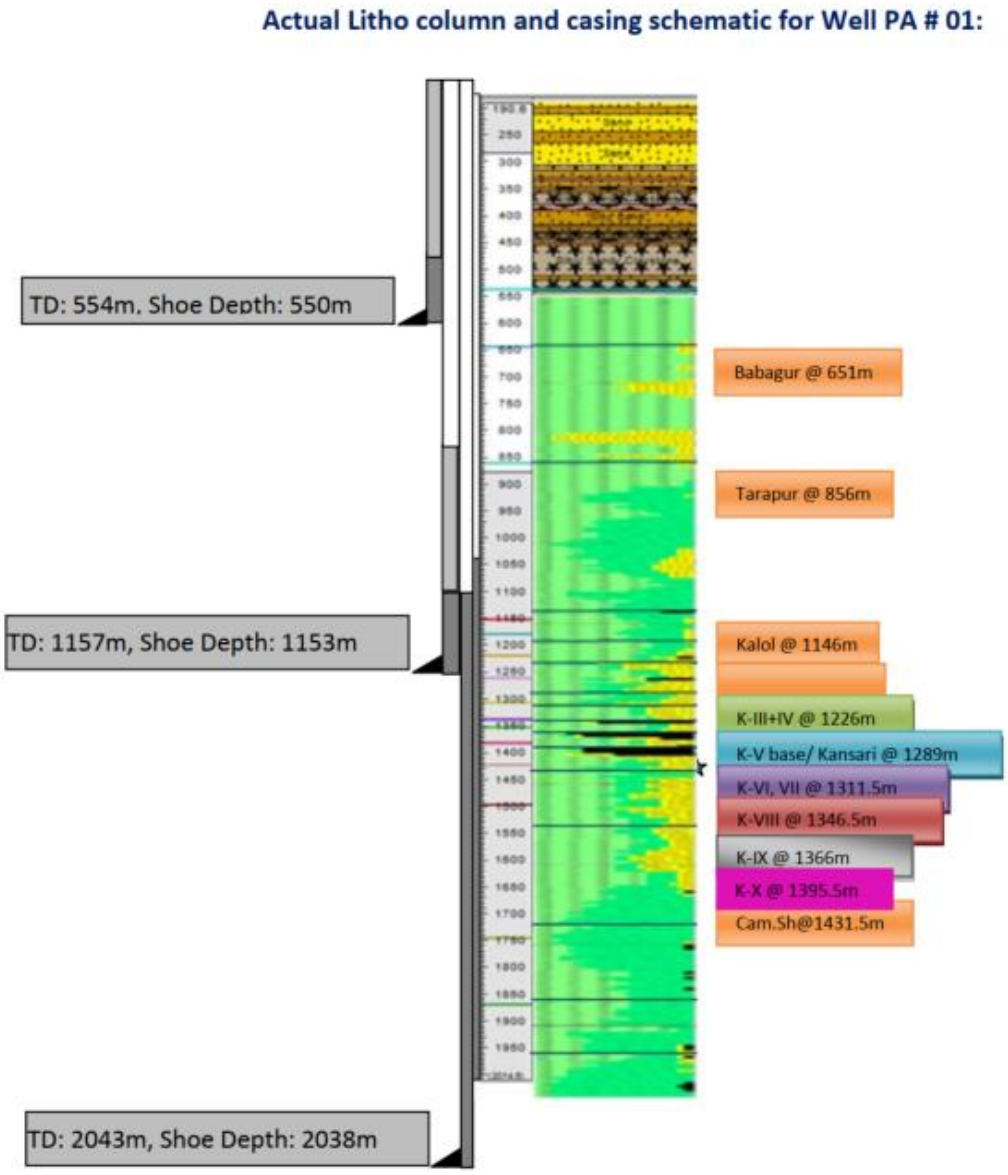


Figure 4-4:Litho-section information of PA#01



JANUARY- MARCH 2016

MARKER TOPS- PLANNED (vs) ACTUAL TOPS

S.No.	Formation	Planed top	Actual (m)
1	Babaguru	644	651
2	Tarapur	861	856
3	Kalol	1152	1146
4	LRM	1179	1179
5	K-III+IV	1219	1226
6	K-V base/Kansari	1261	1289
8	K-VI+VII	1307	1311.5
9	K-VIII	1338	1346.5
10	K-IX	1353	1366
11	K-X	1382	1395.5
12	Cambay Shale	1423	1431.5

4.2.2 Well logging and formation evaluation

The well logs of all discovery wells along with some key wells in the contract area have been reviewed. The logs recorded in various open-hole sections along with cased hole logs and information of conventional and other wireline formation test data are presented in this docket. The availability of key input reports like Well Completion Reports (WCR) has been checked and information given. Reservoir parameters of interesting zones and results of the tested zone(s) have been included in this report. Log motifs of tested/ interesting zone are also appended.

A) Well completion and log evaluation reports availability (PA#01):

WCR/ FER availability	Spud date	KB	Drilled depth
Only WCR available	28.01.2016	64.34 m	2043 m

B) Well logs acquired (PA#01):

SLB wire line logging unit carried out the following suits of wire line logging (**Table 4-2, Table 4-3 and Table** 4-4**).**

Table 4-2: Wire line Logging operations: Depth 1148 m to 551 m

Sr. No	Run Number	Wire line logging	Date
1	Run#1	DLL-MSFL-CALI-SP-GR (1148m-554m)	25.02.2016
2	Run#2	PEX-BHC Sonic-CALI-GR (1150m-551m)	25.02.2016

Table 4-3: Wire line Logging operations: Depth 1447 m to 575m

Sr. No	Run Number	Wire line logging	Date
1	Run#1	DLL-MSFL-GR-SP Recorded from 1447m to 1140m	05.03.2016
2	Run#2	PEX-CALI-BHC-GR Recorded from 1449m to 1140m	05.03.2016
3	Run#3	CBL-VDL Recorded from 1141m to 575m	05.03.2016
4	Run#4	CMR Recorded from 1435m to 1185m	07.03.2016
5	Run#5	MPRQ-MRPA-MRFA sampling log	07.03.2016

Table 4-4: Wire line Logging operations: Depth 2019 m to 1175 m

Sr. No	Run Number	Wire line logging	Date
1	Run#1	DLL-MSFL-GR-SP-CALI Recorded from 2019.96 m to 1197.98m	17.03.2016
2	Run#2	DENSITY-NEUTRON-CAL-GR, Recorded from 2020.53 m to 1380.96 m	17.03.2016
3	Run#3	FMI-DSI Recorded from 1153m to 2020m	18.03.2016
4	Run#4	Seismic check shot survey, Depth: from 2020m to 50m	18.03.2016
4	Run#5	CMR-ECS Recorded from 1550m to 1175m	20.03.2016
5	Run#6	SWC ATTEMPTED: 30, RECOVERED: 27 ,BARREL LOST: 3	20.03.2016

C) Well log evaluation and initial test results (PA#01):

Formation Evaluation :

Since no water sample could be taken in MDT, the standard value of 0.25 ohm-m has been considered for Rw at reservoir temperature. Dual water models were used for saturation computation. Archie parameters were taken as a-1, m=2, n=2.

K-III+IVA Pay sand: Full suite of WL logs along with advanced logs like MDT, FMI, DSI & ECS were recorded in this interval. CMR log shows the presence of free fluid in the interval from 1235.5 to 1240m. Petrophysical analysis of this K-III+IV interval is as follows (**Table 4-5**):

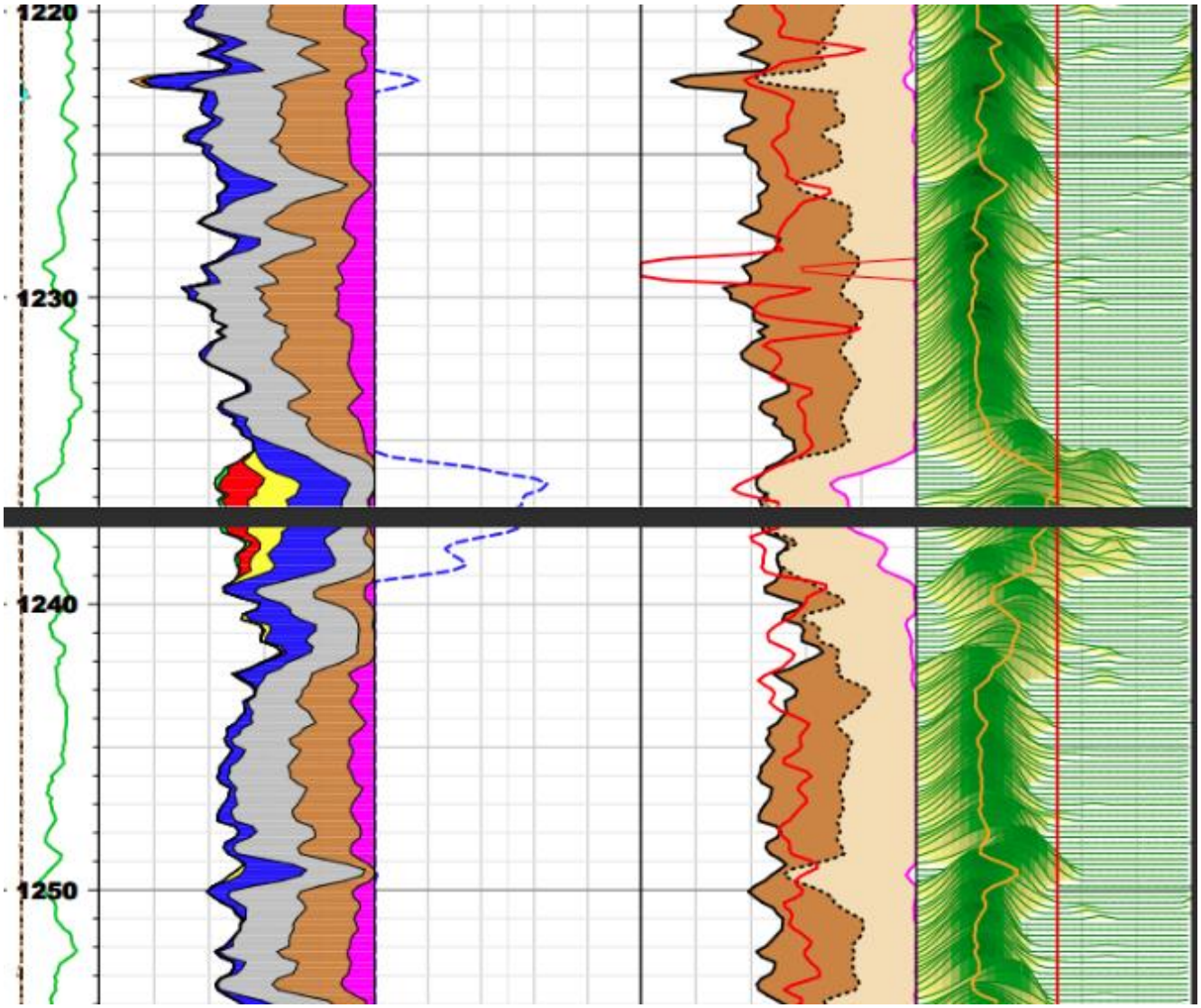
Table 4-5: Petrophysical analysis

Gross Interval	Net Pay Thickness	Average Effective	CMR Permeability	Oil Saturation
1235-1240m	4m	20%	30-40 MD	45%

Older Cambay Shale: Full Log suite recorded in the interval including, Basic WL logs, Formation Micro-Imager, Dipole sonic and check-shot logs. FMI log suggests the presence of laminated alternations of very fine sand / silt with shale and discrete fractures in this interval. Side wall cores in the interval reveal the presence of fractured silty shales with hydrocarbon shows. ELAN results show oil saturation at 1996m and 2000m with an average effective porosity of 10%.

Well log motif for PA#01 is given in **Figure 4-5**

Figure 4-5:Well log motif of PA#01



4.2.3 Well testing and workover history

Well Test PA#01

Two objects were identified to be tested conventionally in Older Cambay Shale,
Object-IA: 1995-2001m & **Object-1B**: 1969-1987m:
6 bbls of 29.77 ^{Q}API oil was recovered along with immeasurable quantity of gas during reverse circulation after N2 application. Well indicated the presence of oil and gas but was **not conclusive**.

Object- II (1235-1239m MD): DST:
Multi-bean study was carried out. The testing results are as follows in **Table 4-6.**

Table 4-6: Multi-bean flow results of Object-II, K-III+IVA in PA#01

Choke	Flow Duration	Qo	Qw	Qg	FTHP (Avg)	FBHP (Avg)
inch	Hrs	bpd	bpd	scmd	psi	psi
12/64"	12:00	27	0	0	35	1435
16/64"	12:00	19	0	0	25	1410
20/64"	12:00	17	0	0	15	1391
24/64"	12:00	16.8	0	0	5	1360

Post mud-acid job improvement was observed and rates varied from 12-36 bopd to average flowing pressure of 40psig. Cum production 112.9 stb during testing.
Avg. tubing head temperature: 300 ^{0} C
Reservoir pressure: 1899 psi
Reservoir Temperature: 83^{0}C
Oil gravity in API units: 29 ^{0} API

Summary:
Reservoir Pressure at MPP datum 1237m : 1852 psi
Permeability,k: 0.9-1.22 mD
k.h : 12.4 -16 mD.ft
Temperature ~ 80.5 degC

4.2.4 Reservoir engineering studies and analysis

Key reservoir engineering datasets, wherever available, have been collated and presented under various data genres. In a comprehensive data presentation, the results are included from well tests, formation dynamics tests, reservoir pressure build-up study and PVT data/ results.

Formation dynamics tests (PA#01):

MPRQ-MRPA-MRFA Sampling Log results:

Maximum recorded temperature from thermometer of LEH is 178 degF
Pretest details: 10 valid, 5 tight, 5 dry and 1 no seal.
Samples collected: @ 1236.9m: 9.5 ltrs of oil, 3.6 cu ft of gas collected at surface. (Sample 1 timing: 2hrs 20min)
Sample collected: @ 1238.2m: 9 ltr of oil, 3.2 cu ft of gas and around 500ml of water collected at surface.
(Sample 2 timing:1hr 45min)

MDT pressure tests details of PA#01 is tabulated in **Table 4-7.**

Table 4-7: MDT Sampling log in PA#01

S.No	Depth (MD) (m)	Mud Pressure Before (psi)	Mud pressure after (psi)	Last BU Pressure (psi)	Formation Pressure (psi)	Temperature After (F°)	Status and Remarks
1	1414	2606.556	2606.632	2584.341	2584.341	175.51	Tight test
2	1391.01	2564.396	2564.457	678.456		176.11	Dry test
3	1360.99	2509.267	2509.379	345.867		175.23	Dry test
4	1357.16	2502.282	2502.345	782.781		174.24	Tight test
5	1344.02	2478.206	2478.16	345.278		173.42	Dry test
6	1317.5	2429.404	2429.365	1961.699	1961.699	171.79	
7	1249.81	2304.436	2304.436	1676.078		165.79	tight test
8	1243.01	2310.459	2291.968	529.8		165.75	Dry test
9	1240.98	2288.115	2288.253	2128.135	2128.135	165.78	
10	1223.02	2255.454	2255.435	2253.317		165.66	Lost seal
11	1223.02	2255.433	2255.403	2254.683	2254.683	165.43	
12	1221.3	2252.148	2252.298	1234.3		165.46	Tight test
13	1213.54	2238.084	2239.17	386.248		165.34	Dry test
14	1238.51	2284.2	2284.023	1928.993	1928.993	165.57	
15	1239	2284.843	2284.897	1933.555	1933.555	166.03	
16	1237.98	2282.992	2284.059	1918.741	1918.741	166.47	
17	1237.03	2281.273	2281.517	1902.727	1902.727	167.9	
18	1236.53	2280.327	2280.332	1894.277	1894.277	167.91	
19	1189.98	2194.835	2194.768	2056.132		165.78	Tight test
20	1236.87	2311.989	2296.023			172.71	Sample: 9.5Lts of oil, and 3.6 cu ft of gas at surface

	1238.18	2261.386	2280.735			174.2	Sample: 9 lts of oil, 3.2 cu ft of gas, approx 500 ml of water

Pressure build-up study (PA#01)

The main target K-III+IV sand was perforated in underbalanced condition with 6spf gun and was tested by utilizing cased hole DST with following objectives.

Test upper zone of interest from 1235-1239m (Object-II) utilizing cased hole DST.

Oil/Gas composition analysis (PA#1)

The API gravity is 29.77° and FVF is 1.2 v/v.

4.2.5 Geology and Reservoir Description of Pasunia (PA#01) field:

The geology of the area has been comprehensively reviewed using correlations, sections and maps. The well correlation, seismic sections, top structure, seismic attribute/amplitude and net sand/pay maps have been used to illustrate the magnitude and distribution of key reservoir properties in and around the discovered oil/gas pools (accumulations). The local tectonic setting and geological section of the area, wherever available are also given. These maps/sections are sequentially shown field-wise and reservoir unit-wise through figures, appropriately titled and illustrated in the following section.

Geological correlations, sections and maps (PA#01):

The discovery is situated near the eastern rising margin of the Ahmedabad area. A part of the eastern rising margin lies within the eastern parts of the block. The Nardipur - Walod - Nenpur low passes along the western part of the block. In the western part the sediments dip with low angles towards the west, while in the eastern part the dips are higher. A ENE-WSW trending transverse fault separates the two portions of the block. Though no major longitudinal faults are present, several small scale faults are present in both the syn-rift as well as the post rift sections. Seismic imaging reveals possible Deccan Trap Basement to be present at depths of more than 4km. The sym-rift sediments are separated from the post-rift by seismically imaged unconformity. The Gamij field with listric fault lies to the east of the block. On the west, the Bakrol field is present, through which the western rising flank of the Nardipur - Walod - Nenpur low passes.

Seismic section along the well PA#01, Depth-Structure map, structure map at near top of PA#01 showing faults related Trap Door Structures and Structure contour map at top of PA#01 pay showing discovered and its associated pools are shown in **Figure 4-6, Figure 4-7, Figure 4-8 and Figure 4-9.**

Figure 4-6:Seismic sections along the well PA#01 & PA#02

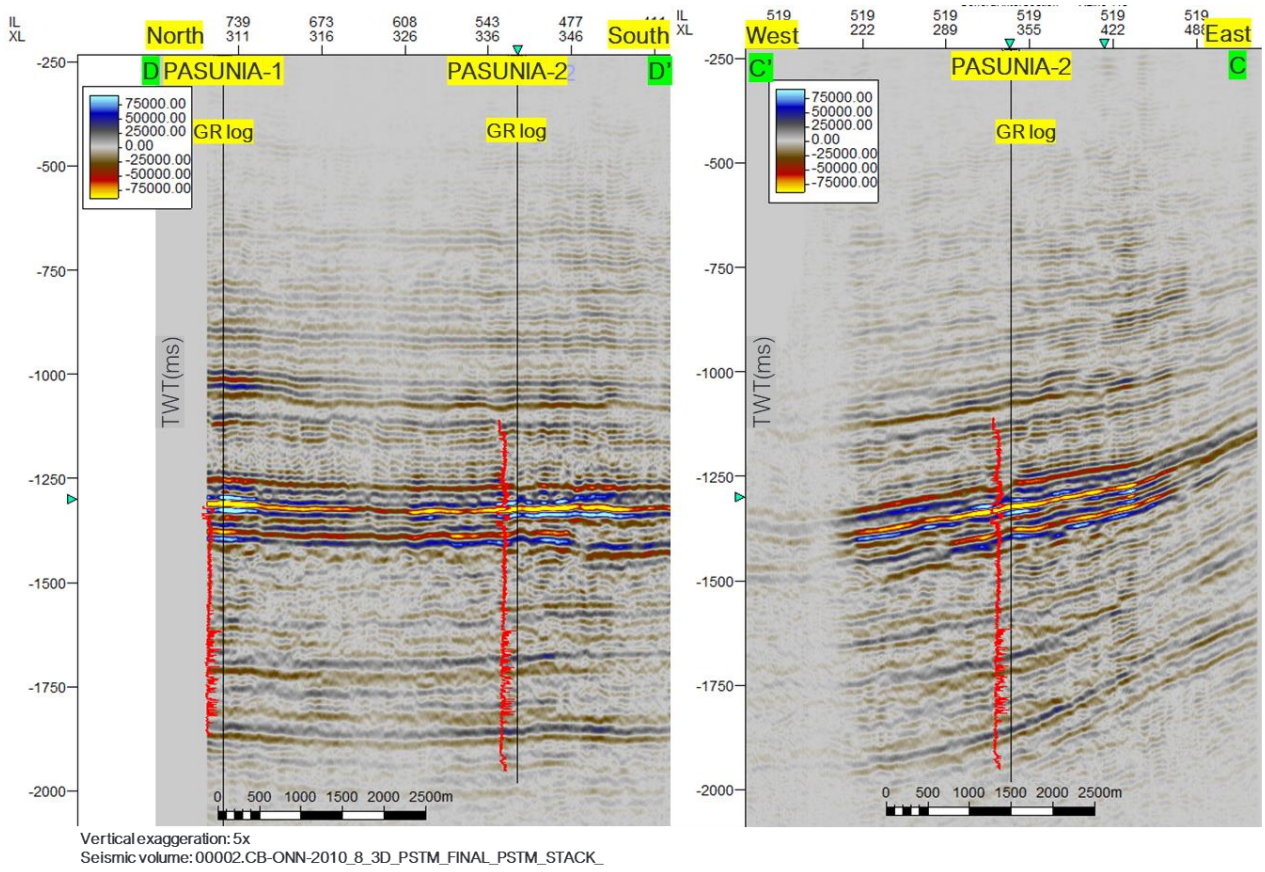


Figure 4-7: Structure map with PA#01 and PA#02 hydrocarbon main pools and potential traps

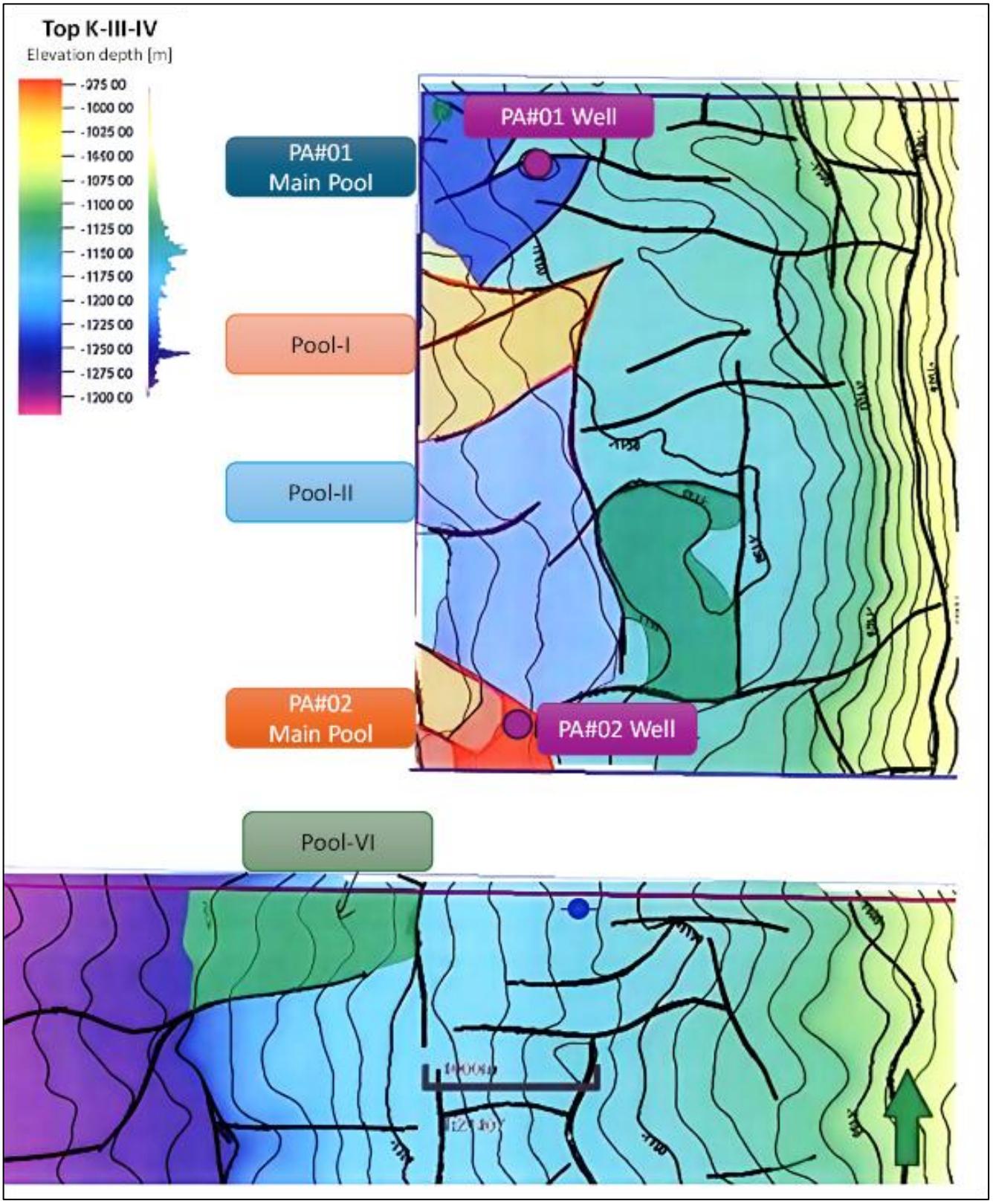


Figure 4-8:Structure map at near top of PA#01 showing faults related Trap Door Structures

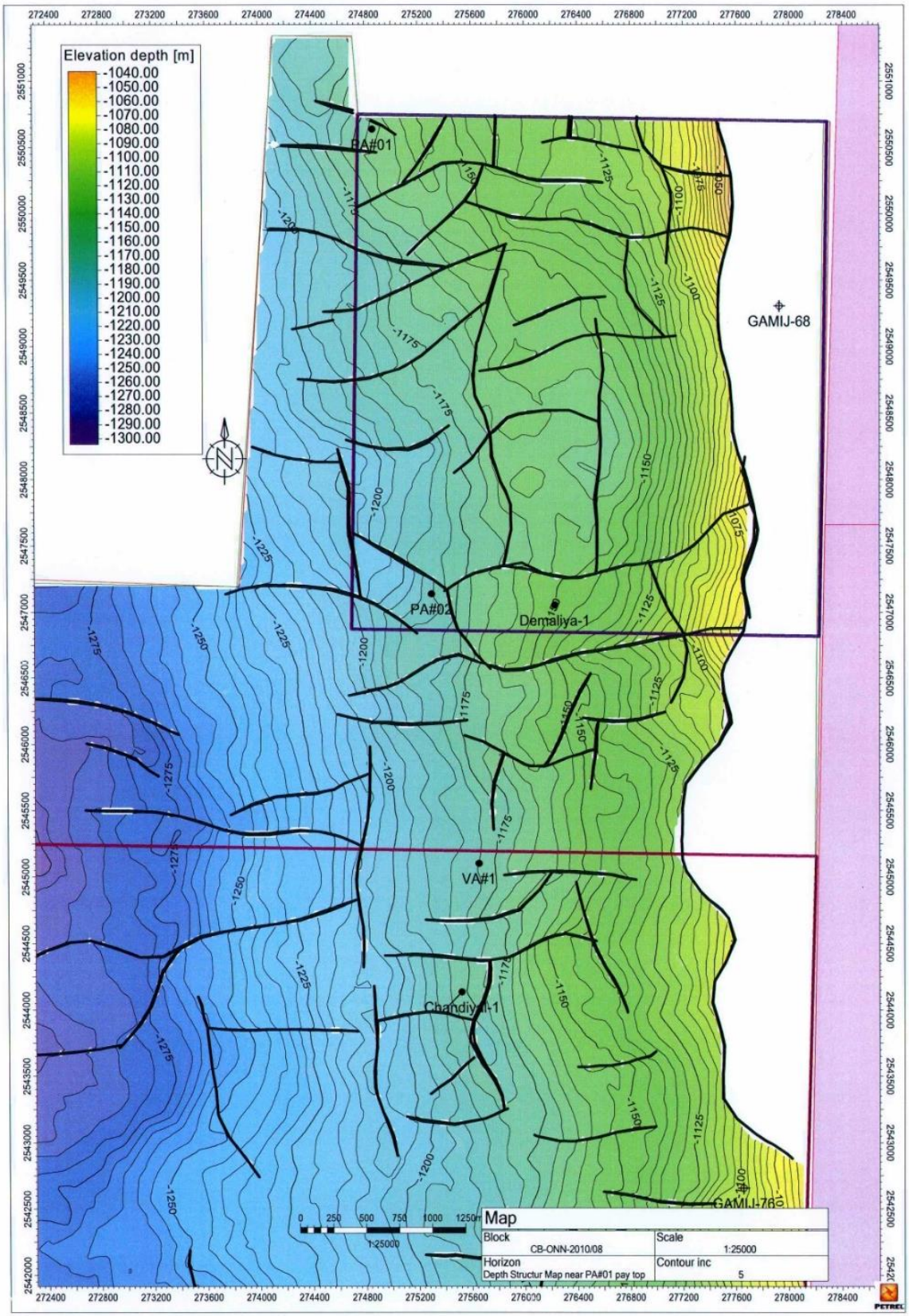
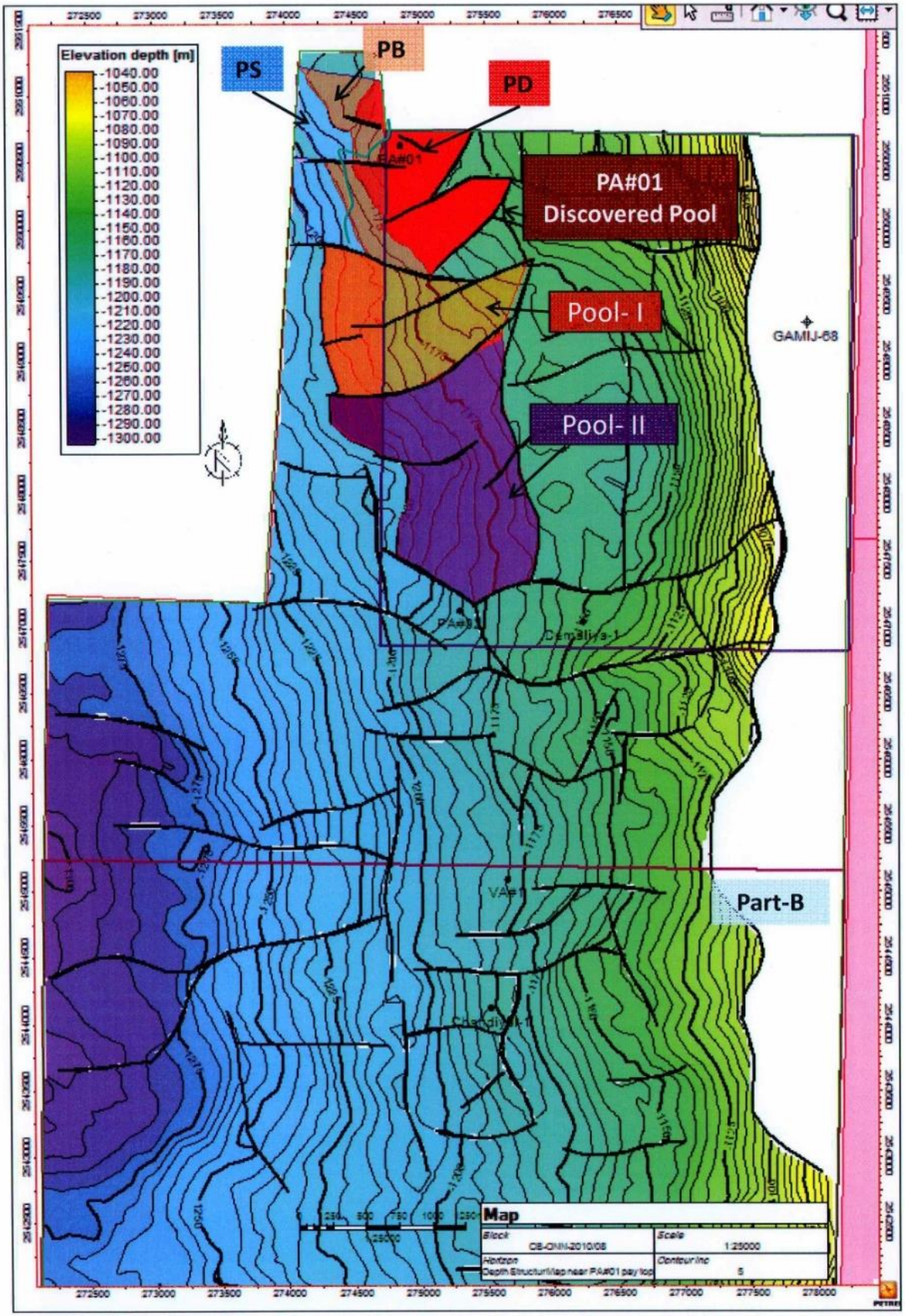


Figure 4-9: Structure contour map at top of PA#01 pay showing discovered and its associated pools



4.2.6 Reservoir parameters and hydrocarbon estimates (PA#01):

The estimates of hydrocarbon in-place have been worked out under various field assumptions, and all inputs, working and results, as available and sourced are presented in the following section.

Petro-physical Parameters

The Petro-physical analysis of pay sand K-III+IVA and parameters used for volumetric estimation of discovered and associated pools are provided below in **Table 4-8.**

Table 4-8: Petro-physical analysis result of K-III+IVA sand

Gross Interval	Net Pay Thickness	Porosity, Average Effective	CMR Permeability	Oil Saturation
1235-1240m	3m	20%	30-40 MD	45%

Parameters considered for volumetric estimation of discovered and associated pools are:

Name	Area (m^2)	Net Pay Thickness m	Porosity Average Effective	Hydrocarbon Saturation	FVF M3/m3	GOR M3/m3
PA#01 Discovered Pool	1.343	3	20%	0.45	1.2	100
Pool-I	1.153	3	20%	0.5	1.2	100
Pool-II	1.72	2.5	20%	0.5	1.2	100

A volumetric estimation for PA#01 discovery area are given in **Table 4-9 and Table 4-10.**

Table 4-9: Volumetric estimation (2P) for the PA#0l discovery area

Field	O+OEG, MMTOE
PA#01	**0.30**

Table 4-10: Volumetric estimation of associated pools of PA#01 discovery area

Pool	O+OEG, MMTOE
Pool-I	**0.28**
Pool-II	**0.35**

Erstwhile Operator-reported estimates on record:

The field has a reported hydrocarbon estimate (O+OEG) of **0.12 MMTOE**.

All these hydrocarbon estimates are subject to future assessments based on Operator's own technical insights and additional information/data, which may warrant possible revision of the currently reported estimates.

4.2.7 Production Facility for Oil and Gas Evacuation:

Near-by surface Facility with distance: ONGC Navagam CTF at around 45Km southwest

CAMBAY ONSHORE PASUNIA-2 (PA#02) FIELD

4.3 DESCRIPTION OF CAMBAY ONSHORE PASUNIA-2(PA#02) FIELD

4.3.1 Drilling and well completion

Key information of drilled wells has been collated and presented hereunder. The adjoining figures wherever shown illustrate the Well Construction Diagram and the Litho-column Information for key wells. Other well statics like kelly bush reference depth, water depth, drilled and logged depth including well coordinates are made available in Sections through various cross-references.

Well construction diagram and litho column of PA#02 are shown in **Figure 4-10 and Figure 4-11. Table 4-11** tabulates the marker tops planned vs. actual in PA#02.

Figure 4-10: Well profile of PA#02

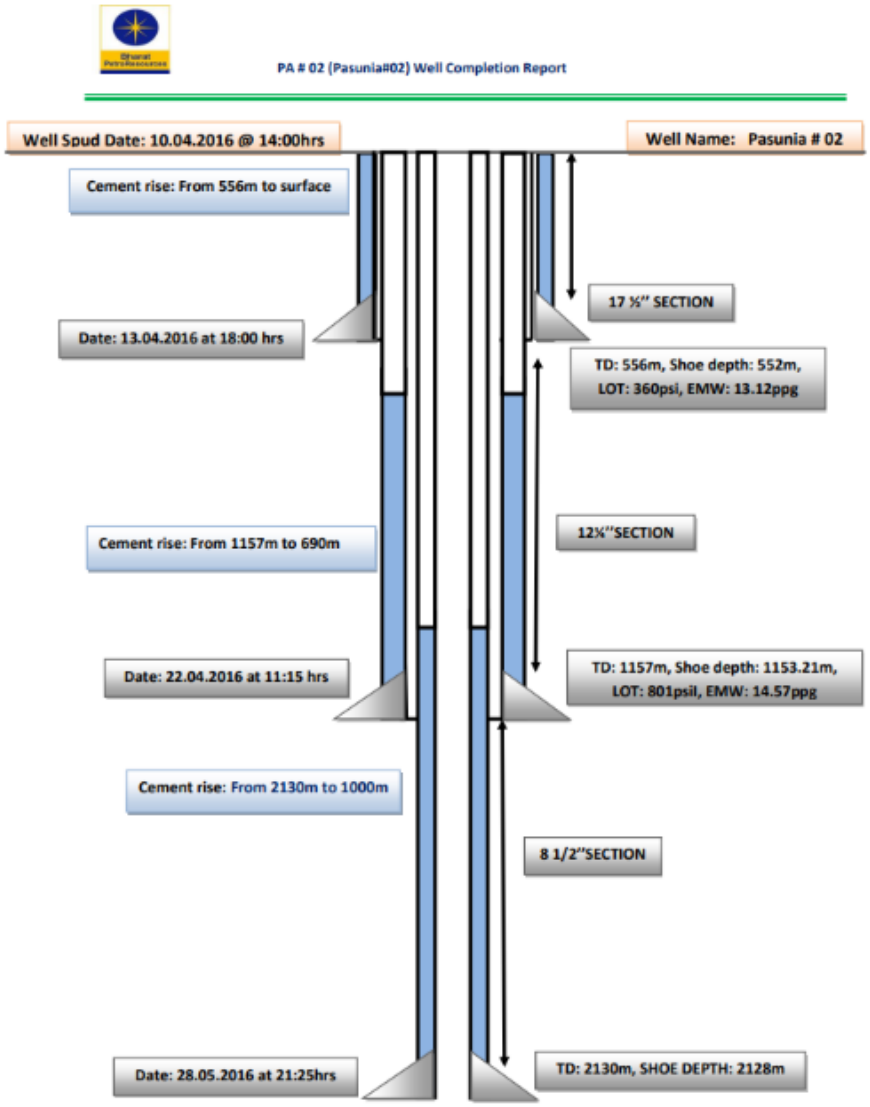


Figure 4-11:Actual Litho column and casing schematic for Well PA#02

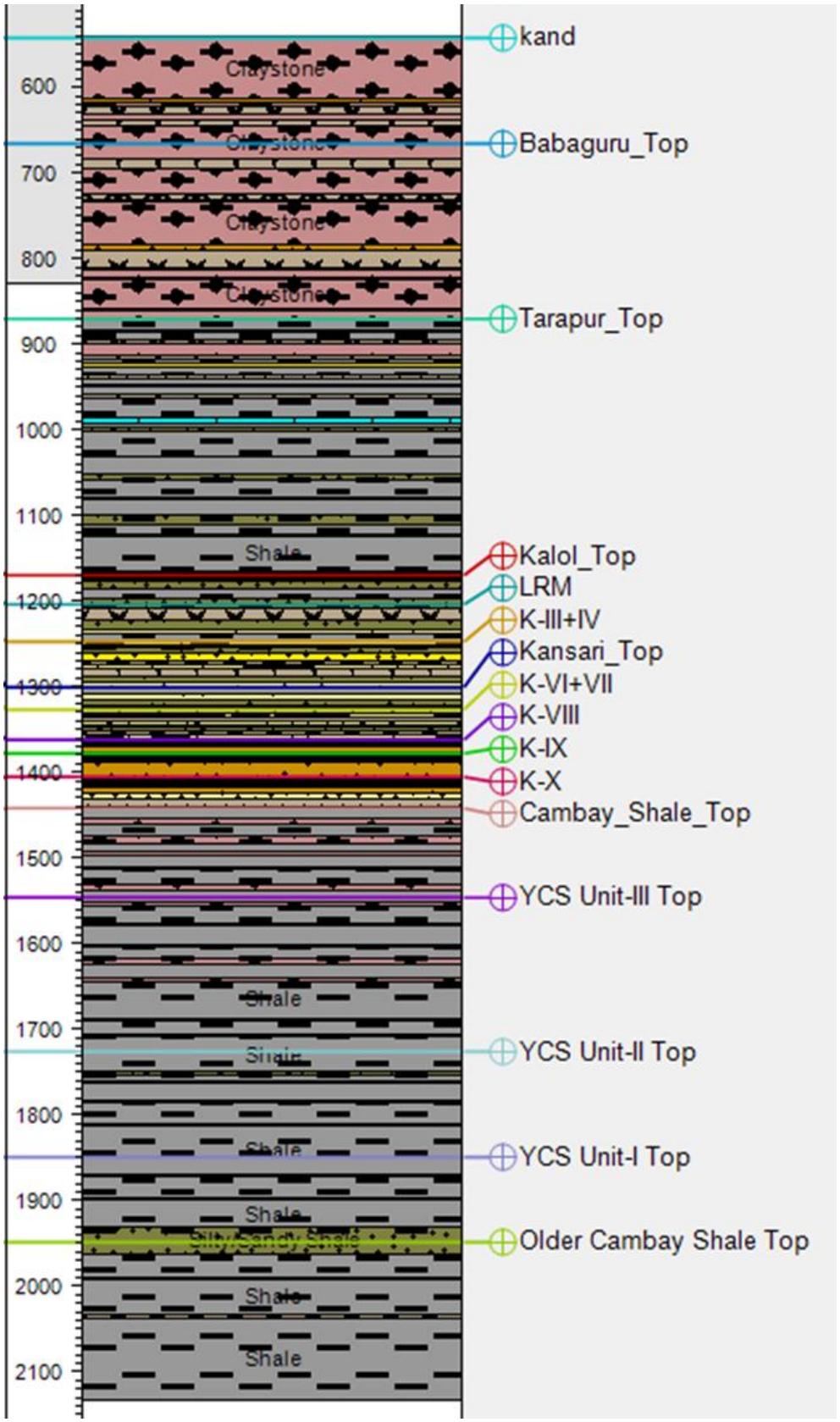


Table 4-11: MARKAR TOPS- PLANED (vs) ACTUAL TOPS in PA#02

S.No.	Formation	Planed top	Actual (m)
1	Babaguru	670	666
2	Tarapur	887	871
3	Kalol	1167	1170
4	LRM	1194	1203
5	K-III+IV	1233	1244
6	Kansari	1264	1300
8	K-VI+VII	1325	1327
9	K-VIII	1352	1362
10	K-IX	1366	1378
11	K-X	1397	1405
12	Cambay Shale	1435	1438.5

4.3.2 Well logging and formation evaluation

The well logs of all discovery wells along with some key wells in the contract area have been reviewed. The logs recorded in various open-hole sections along with cased hole logs and information of conventional and other wireline formation test data are presented in this docket. The availability of key input reports like Well Completion Reports (WCR) has been checked and information given. Reservoir parameters of interesting zones and results of the tested zone(s) have been included in this report. Log motifs of tested/ interesting zone of key wells are also appended.

A) Well completion and log evaluation reports availability (PA#02):

WCR/ FER availability	Spud date	KB	Drilled depth
Only WCR available	10th APRIL 2016	62.92 m	2130 m (MDRT)

B) Well logs acquired (PA#02):

SLB wire line logging unit carried out following suits of wire line logging (**Table 4-12 and Table 4-13**).

Table 4-12: Logs acquired in PA#02: Depth 1458 m to 1160 m

Sr. No	Run Number	Wire line logging	Date
1	Run#1	DLL-MSFL-CALI-SP-GR Recorded from 1456m to 1154m	02.05.2016
2	Run#2	LDL-CNL-CALI-GR Recorded from 1458m to 1154m	03.05.2016
3	Run#3	CMR Recorded from 1455.2m to 1160m	03.05.2016
4	Run#4	MDT-Dual packer sampling log	04.05.2016
5	Run#5	CBL-VDL-CCL-GR	05.05.2016

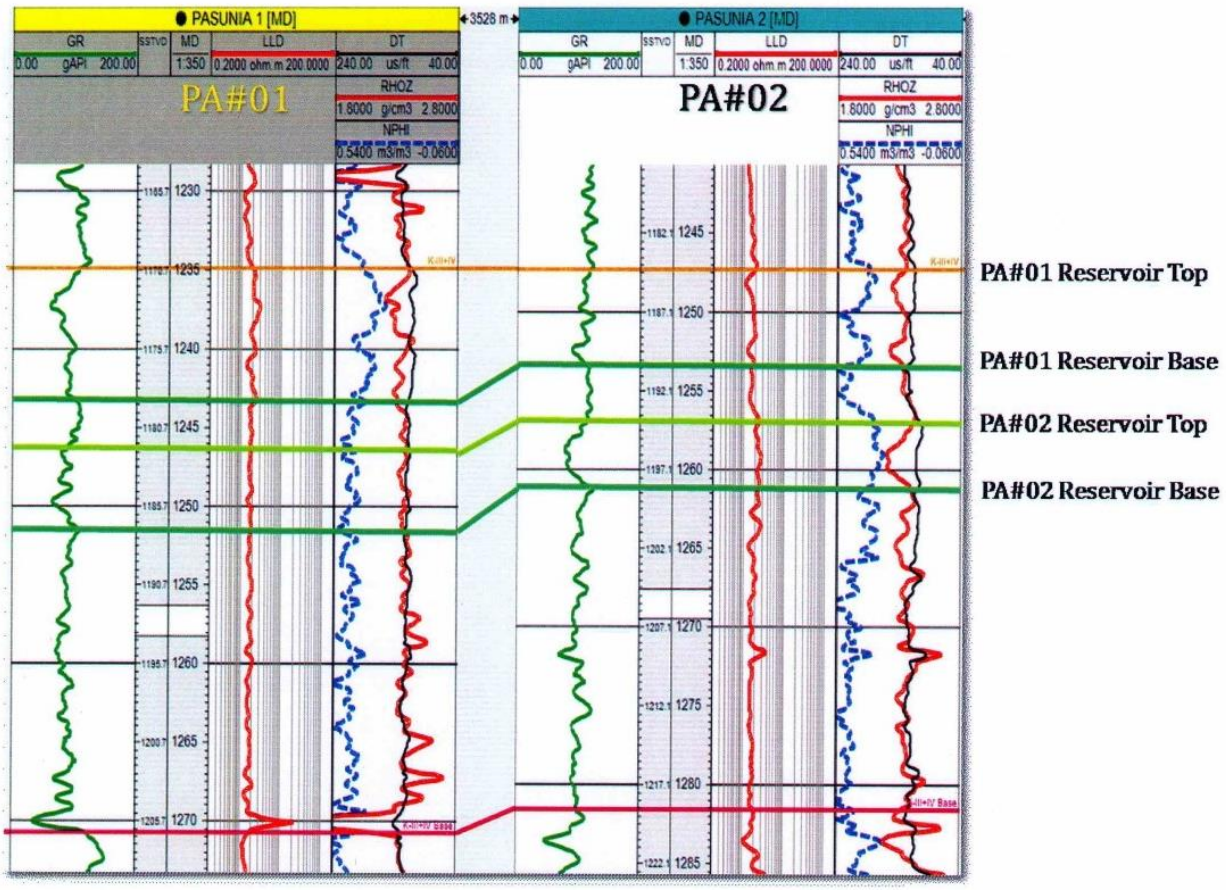
Table 4-13: Logs acquired in PA#02

Sr. No	Run Number	Wire line logging	Date
1	Run#1	DLL-MSFL-GR-SP-CALI Recorded from 2096m to 1153.21m, Logger's Depth: 2101m.	16.05.2016
2	Run#2	LDL-CNL-CALI-SP-GR Recorded from 2098m to 1153.21m	17.05.2016
3	Run#3	FMI-DSI Recorded from 2087m to 1153m	17.05.2016

4	Run#4	CMR-ECS Recorded from 2089m to 1158m	19.05.2016
5	Run#5	Seismic check shot survey, Depth: from 2100m to 654m	19.05.2016
6	Run#6	MDT	21.05.2016
6	Run#7	SWC, ATTEMPTED: 30, RECOVERED: 28 , BARREL LOST: 02	30.05.2016

Log Correlation of reservoirs within K-III+IV, between PA#01 and PA#02: **Figure 4-12**

Figure 4-12:Log Correlation of reservoirs within K-III+IV, between PA#01 and PA#02



C) Well log evaluation and initial test results (PA#02):

Formation Evaluation :

Since no water sample could be taken in MDT, the standard value of 0.25 ohm-m has been considered for Rw at reservoir temperature. A dual water model was used for saturation computation. Archie parameters were taken as a=1, m=2, n=2.

K-III+IV B Pay sand: Full suite of WL logs along with advanced logs like FMI, DSI & ECS were recorded in this interval. CMR log shows the presence of free fluid in the interval from 1257 to 1261m with 100MD permeability.

Petrophysical analysis of K-**III+IV** interval is as follows **(Table 4-14**):

Table 4-14: Petrophysical analysis findings of K-III+IV interval

Gross Interval	Net Pay Thickness	Average Effective Porosity	CMR Permeability	Oil Saturation
1256-1261 m	5 m	20%	100 MD	55%

Older Cambay Shale: Log suites recorded in the interval includes Basic WL logs, Formation Micro-Imager, Dipole sonic and CMR-ECS. The log characteristic of OCS interval in PA-2 is similar to that of PA-I. The OCS interval corresponds to fractured thinly laminated silt and silty shale with some indication of movable hydrocarbons. Side-wall cores obtained from the interval confirm the presence of laminated siltyshales, siltstones and fissile shale, which yielded hydrocarbon shows. The older Shale is identified as an object for future testing.

4.3.3 Well testing and workover history

Well Test PA#02

Object I: 1256-1261m (Conventional testing)
Well was perforated with 3-3/8" HSD guns at 6spf from 1256m-1261m (total 5m) on 25th October 2016 and oil surfaced on 27th October 2016, after N2 Application.

Multi-bean study was carried out. The results are as follows in **Table 4-15.**

Table 4-15: Multi bean flow results of Object-I, K-III+IVB in PA#02

Perforation Interval: 1256-1261m (5m) Kalol-III+IVB Sand

Choke	Flow Duration	Qo	Qw	Qg	FTHP (Avg)	FBHP (Avg)	Remarks
xx/64''	Hrs	bpd	bpd	SCMD	psi	psi	
12/64''	12:00	20.4	0	0	52	1522	Small quantity of gas flowed, Oil ~ 31 degree API
16/64''	12:00	17	0	0	22	1446	
20/64''	12:00	23	0	0	26	1397	
24/64''	12:00	25.2	0	0	10	1327	
0	72:00	Well shut-in for Main Build-up					72hrs build-up

Oil self flow rate of ~25 bopd was observed through 24/64" choke size.
Maximum surface pressure recorded: 363 psi (SITHP), Max. tubing head temperature: 39 ^{0}C,
Oil gravity is 30.5 degree API.
Reservoir pressure and temperature are 1934.8 psi (MDT) and 84 ^{0}C. Cum production 164.13 stb during testing.

Gas also flowed but the rate was too small to measure.
The testing of the well PA#02, Object I (K-III+IVB) has proved presence of producible quantity of oil from the reservoir

4.3.4 Reservoir engineering studies and analysis

Key reservoir engineering datasets, wherever available have been collated and presented under various data genres. In a comprehensive data presentation, the results are included from well tests, formation dynamics tests, reservoir pressure build-up study and PVT data/ results.

Formation dynamics tests (PA#02)

MDT pressure tests details are tabulated in **Table 4-16 and Table 4-17.**

MPRQ-MRPA-MRFA Sampling Log results (Depth 1418.5 m to 1161 m):

Maximum recorded temperature from thermometer of LEH is 173.5 degF
Pretest details: 7 good, 5 tight.
Samples collected: @ 1259m: Oil with some water.

MPRQ-MRP-MRFA Sampling Log results (below 1662m depth):

Maximum recorded temperature from thermometer of LEH is 258 degF
Pretest details: 22 tight, 1 Supercharged, 3 No Seal, 2 Lost Seal, 1 Unstabilized

Table 4-16: MDT pressure tests in PA-2 in depth 1418.5 m to 1161 m in PA#02

S.No	Depth (MD) (mtr)	Mud Pressure Before (psi)	Mud Pressure After (psi)	Last BU Pressure (psi)	Formation Pressure (psi)	Temperature After (F°)	Status and Remarks
1	1283.6	2366.1	2366.0	1989.2	1989.2	147.0	Good test
2	1418.5	2611.9	2613.1	1391.8	NA	155.9	Tight test
3	1264.5	2329.3	2329.7	1679.9	NA	158.0	Tight test
4	1262.5	2325.0	2325.4	1371.1	NA	162.1	Tight test
5	1260.0	2318.9	2319.7	1949.6	1949.6	162.3	Good test
6	1260.5	2320.9	2318.4	2047.5	NA	166.1	Tight test
7	1259.5	2314.7	2315.2	1940.0	1940.0	166.4	Good test
8	1259.0	2313.4	2320.0	1934.8	1934.8	173.5	Good test 1 Sample collected
9	1258.5	2315.2	2314.5	1932.7	1932.7	171.9	Good test
10	1254.5	2307.7	2307.6	1083.9	NA	171.9	Tight test
11	1248.5	2297.1	1711.6		NA	171.0	Tight test
12	1247.5	2295.1	2294.5	1394.9	NA	170.9	Tight test
13	1172.0	2158.4	2157.4	2156.8	2156.8	170.0	Good test
14	1161.0	2138.1	2137.3	2136.8	2136.8	167.8	Good test
15	1252.5	2304.0	2362.6	NA	NA	172.5	Tight test

Table 4-17: MDT pressure tests in PA-2 below 1662m depth in PA#02

S.No	Depth (MD) (mtr)	Mud Pressure Before (psi)	Mud Pressure after (psi)	Last BU Pressure (psi)	Formation Pressure (psi)	Temp After (F°)	Status and Remarks
1	2088.97	4097.157	4111.963	1647.775	-	236.13	Tight Test
2	2085.48	4094.272	4106.323	1694.398	-	237.07	Tight Test
3	2075.2	4067.588	4085.131	3005.177	-	237.66	Tight Test
4	2075.6	4070.214	4089.804	4098.188	-	239.04	Lost Seal
5	2075.59	4083.051	4088.961	3457.351	-	239.66	Tight Test
6	2068.98	4056.323	4075.141	4077.811	4077.811	241.07	Supercharged
7	2062.47	4042.954	4060.664	3785.798	-	241.61	Tight Test
8	2062.68	4046.273	4060.347	3077.366	-	241.89	Tight Test
9	2050.12	4024.427	4035.739	3428.439	-	242.01	Tight Test
10	2043.81	4019.201	4022.519	3023.226	-	242.08	Tight Test
11	2042.43	4014.3	4019.133	2919.776	-	242.37	Tight Test
12	2032.18	3985.059	3997.542	3998.694	-	242.39	No Seal
13	2032.33	3994.183	3998.783	4001.084	-	242.61	No Seal
14	2014.17	3949.719	3961.098	1531.014	-	242.27	Tight Test
15	2014.51	3958.17	3962.169	3963.717	-	241.89	No Seal
16	1992.72	3914.516	3917.274	2066.289	-	240.82	Tight Test
17	1989.51	3909.541	3910.477	2067.36	-	239.94	Tight Test
18	1946.96	3810.567	3820.642	1456.777	-	238.44	Tight Test
19	1945.52	3813.747	3819.272	1893.476	-	236.92	Tight Test
20	1935.82	3795.407	3800.408	2070.061	-	235.23	Tight Test
21	1934.52	3791.149	3799.203	2553.329	-	234.88	Tight Test
22	1933.6	3795.085	3797.843	2223.133	-	234.68	Tight Test
23	1928.22	3776.187	3787.647	947.648	-	234.74	Tight Test
24	1838	3599.232	3603.65	1552.816	-	226.16	Tight Test
25	1681.98	3274.136	3283.823	753.513	-	214.99	Tight Test
26	1673.49	3263.448	3269.276	842.693	-	212.77	Tight Test
27	1662.22	3239.095	3247.745	400.439	-	211.56	Tight Test
28	2087.19	4131.81	4115.613	-	-	248.17	Lost Seal
29	2069.04	4052.758	4068.603	-	-	252.96	Unstabilized

Pressure build-up study (PA#02)

PA#2 was spudded on 10.04.2016 to a total depth of 2130m. Full suite of conventional well logs along with advanced logs were recorded in K-III+IVB pay sand. CMR log shows presence of free fluid in the interval from 1257 to 1261m with 100 MD permeability, 18% average porosity and 55% oil saturation are estimated in this interval.

Interval 1256-1261m (total 5m) at Kalol-III+IVB pay level was perforated with 3- 3/8" HSD gun @6spf and was tested conventionally. Oil surfaced after N2 application. Well was flown through multiple chokes.

Oil & Gas composition analysis (PA#02)

The API gravity is 30.5 and FVF is 1.2 v/v.

4.3.5 Geology and Reservoir Description of PA#02 field:

The geology of the area has been comprehensively reviewed using correlations, sections and maps. The well correlation, seismic sections, top structure, seismic attribute/amplitude and net sand/pay maps have been used to illustrate the magnitude and distribution of key reservoir properties in and around the discovered oil/gas pools (accumulations). The local tectonic setting and geological section of the area, wherever available are also given. These maps/sections are sequentially shown field-wise and reservoir unit-wise through figures, appropriately titled and illustrated in the following section.

Geological correlations, sections and maps (PA#02):

The discovery is situated near the eastern rising margin of the Ahmedabad area. A part of the eastern rising margin lies within the eastern parts of the block. The Nardipur - Walod - Nenpur low passes along the western part of the block. In the western part the sediments dip with low angles towards the west, while in the eastern part the dips are higher. A ENE-WSW trending transverse fault separates the two portions of the block. Though no major longitudinal faults are present, several small scale faults are present in both the syn-rift as well as the post rift sections. Seismic imaging reveals possible Deccan Trap Basement to be present at depths of more than 4km. The sym-rift sediments are separated from the post-rift by a seismically imaged unconformity. The Gamij field with listric fault lies to the east of the block. On the west, the Bakrol field is present, through which the western rising flank of the Nardipur - Walod - Nenpur low passes.

Some maps and sections are given as per below:
Seismic section along well PA#02 is shown in **Figure 4-6**.
Structure map with PA#01 and PA#02 hydrocarbon main pools and potential traps: **Figure 4-7**
Structure map near top of PA#02 Pay showing faults related Trap Door Structures: **Figure 4-13**
Structure map at top of PA#2 Pay showing discovered and its associated pools**: Figure 4-14**

Figure 4-13: Structure map near top of PA#2 Pay showing faults related Trap Door Structures

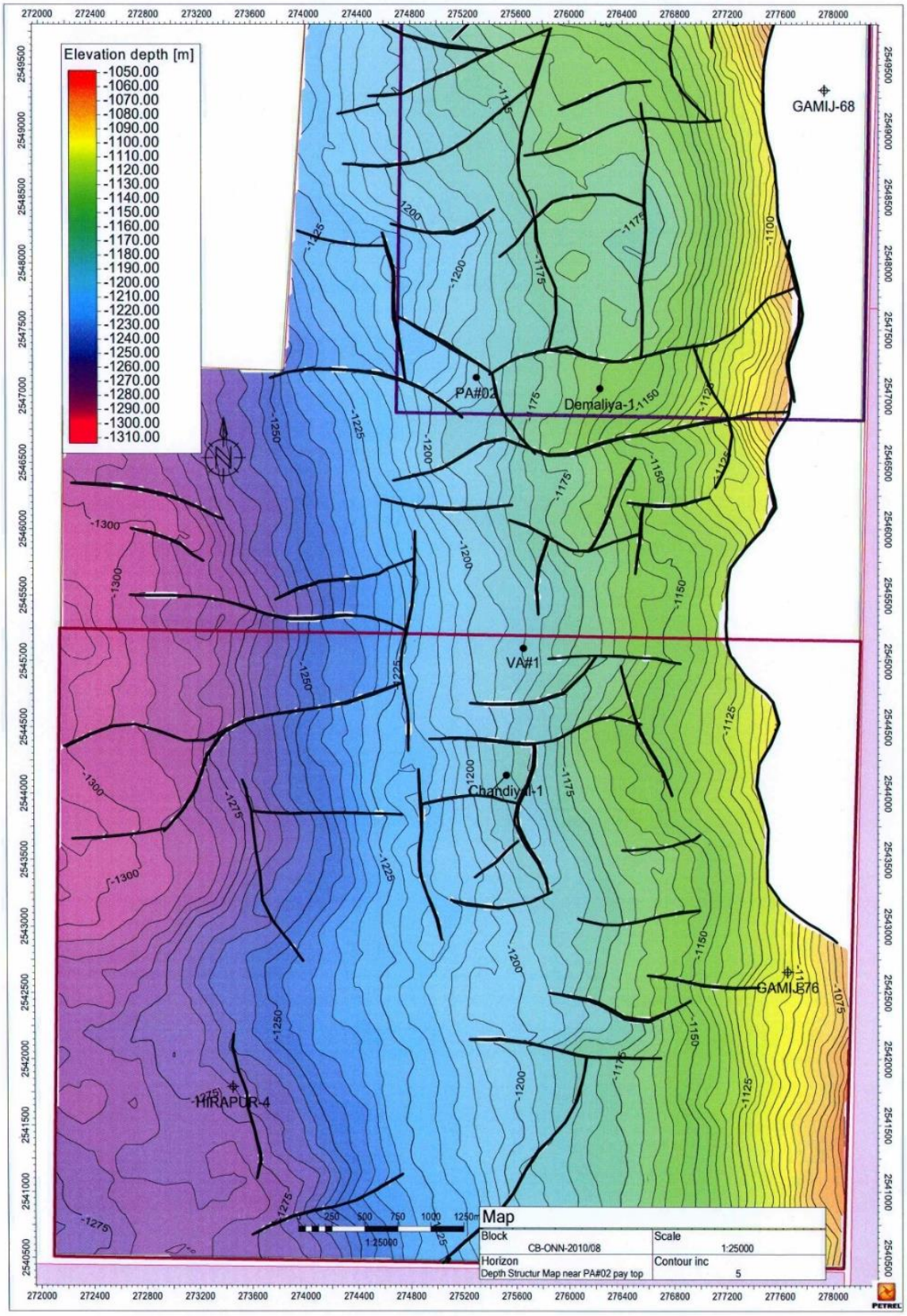
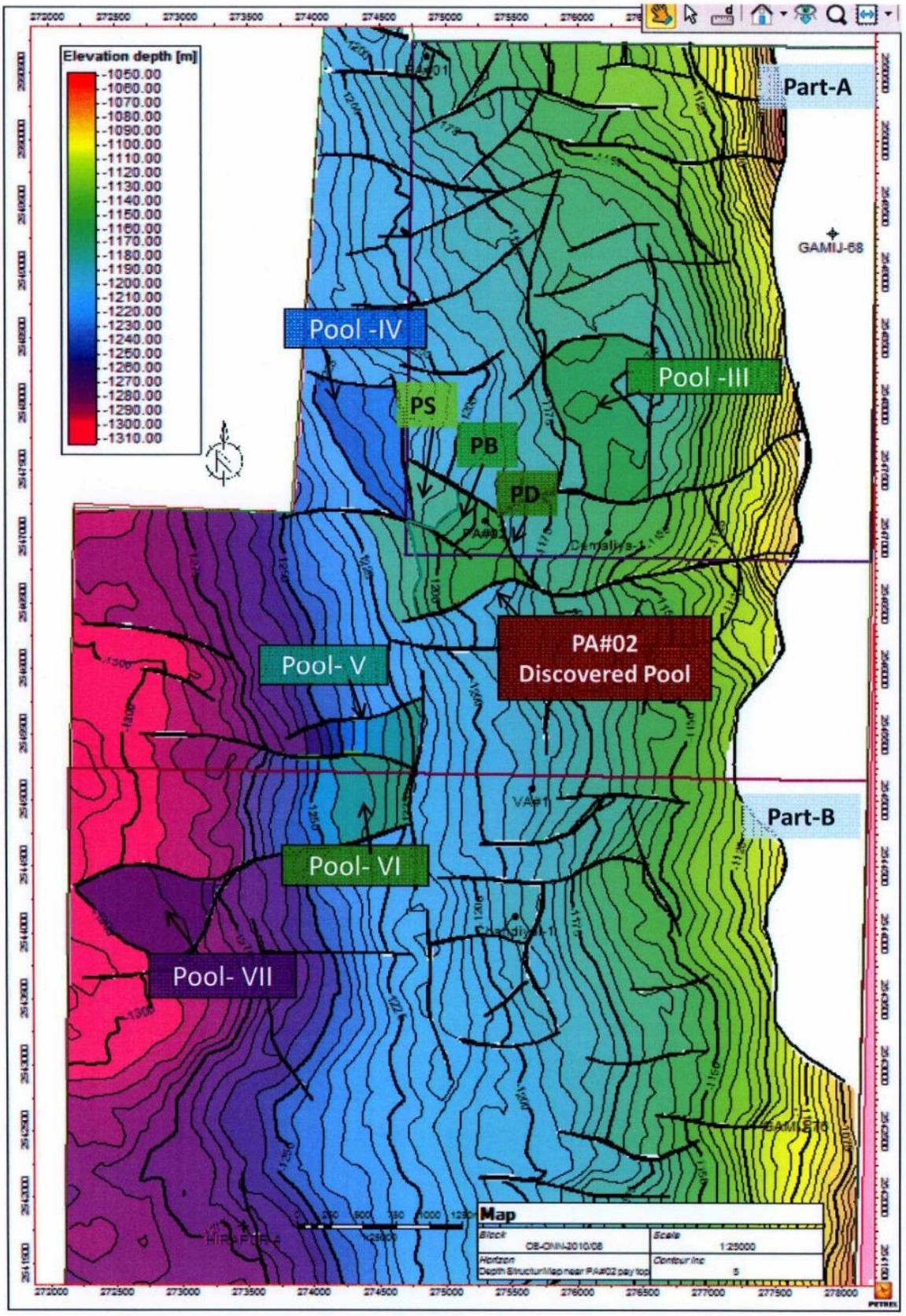


Figure- 8 Structure Map Near Top of PA#02 Pay showing showing Faults related Trap Door Structures

Figure 4-14: Structure map at top of PA#2 Pay showing discovered and its associated pools



4.3.6 Reservoir parameters and hydrocarbon estimates (PA#02):

The Petro-geophysical analysis of this K-III+IVB interval and parameters used for volumetric estimation of discovered and associated pools and their In-place are provided below in **Table 4-18, Table 4-19Table 4-20.**

Table 4-18: Petro-geophysical analysis of K+III+IVB

Gross Interval	Net Pay Thickness	Average Effective Porosity	CMR Permeability	Oil Saturation
1256-1261 m	5 m	20%	100 MD	55%

Parameters considered for volumetric estimation of discovered and associated pools are:

Name	Area (m^2)	Net Pay Thickness m	Pososity Average Effective	Hydrocarbon Saturation	FVF M3/m3
PA#02 Discovered	0.847	3.5	0.2	0.55	1.2
Pool-III	0.76	3.5	0.2	0.5	1.2
Pool-IV	0.323	2	0.2	0.5	1.2
Pool-V	0.359	3	0.2	0.5	1.2
Pool-VI	0.48	3	0.2	0.5	1.2
Pool-VII	0.532	3.5	0.2	0.5	1.2

Volumetric estimation for the PA#02 discovery area are as below in **Table 4-19 and Table 4-20.**

Table 4-19: Volumetric estimation (2P) of PA#02 discovery area

Field	O+OEG, MMTOE
PA#02	**0.26**

Table 4-20: Volumetric estimation of associated pools of PA#02 discovery area

Pool	O+OEG, MMTOE
Pool-III	0.22
Pool-IV	0.05
Pool-V	0.09
Pool-VI	0.12
Pool-VII	0.15
Total	**0.63**

Erstwhile Operator-reported estimates on record:

The field has a reported hydrocarbon estimate (O+OEG) of **0.05 MMTOE**.

All these hydrocarbon estimates are subject to future assessments based on Operator's own technical insights and additional information/data, which may warrant possible revision of the currently reported estimates.

4.3.7 Production Facility for Oil and Gas Evacuation:

Near-by surface Facility with distance: ONGC Navagam CTF at around 45Km southwest from well PA#02

CAMBAY ONSHORE -OGNAJ FIELD

4.4 DESCRIPTION OF CAMBAY ONSHORE OGNAJ-1 FIELD

The first well on the structure, Ognaj-1 was drilled by ONGC in the year 1982 and indicated the presence of hydrocarbon in horizon –X of Kalol Formation. On conventional testing, horizon-X produced oil. Second, well Ognaj-2 was abandoned without lowering the production casing. Based on evaluation of electro-facies in Ognaj-1 & 2 and Two Way Time (TWT) structure map, OGNAJ-3 was drilled as a Development well for exploitation of hydrocarbon from Pay Zone Kalol – X and to reassess the potential of Kalol – IX in Ognaj Block. The location is proposed at the crossing of seismic line G 276-01 and G 276-08 which is on the highest contour at K–IX & X level.

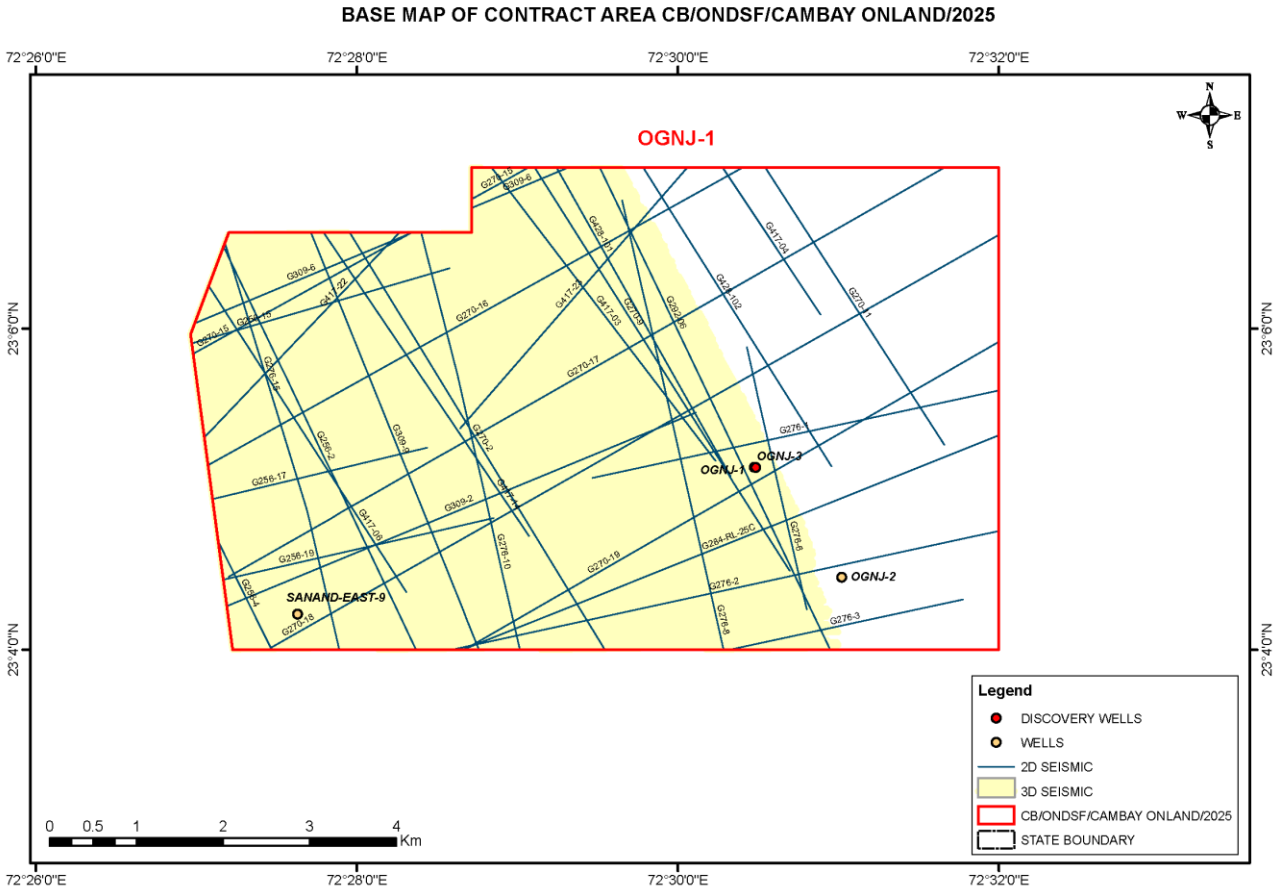
Discovery well Ognaj-1 falls within the channel where as well Ognaj-3 falls on the edge of the channel. Based on VSP results after integration of existing seismic data, the channel for future drilling prospects was identified expecting presence of good reservoir facies.

The co-ordinates of the endpoints defining the cluster boundary are tabulated below in **Table 4-21**. Seismic coverage of Ognaj field is shown in **Figure 4-15**.

Table 4-21: Endpoint coordinates outlining the cluster boundary

	OGNJ-1 Boundary Points		
	Area: 44.34 sq km		
	Point	**Longitude**	**Latitude**
	A	72°32’0.000” E	23°07’0.000” N
	B	72°32’0.000” E	23°04’0.000” N
	C	72°27’13.576” E	23°04’0.000” N
	D	72°26’57.854” E	23°05’57.808” N
	E	72°27’12.199” E	23°06’35.802” N
	F	72°28’42.848” E	23°06’35.802” N
	G	72°28’42.848” E	23°07’0.000” N
	A	72°32’0.000” E	23°07’0.000” N
SL. No.	**Well**	**Longitude**	**Latitude**
1	OGNJ-1	72°30’29.180” E	23°05’07.950” N

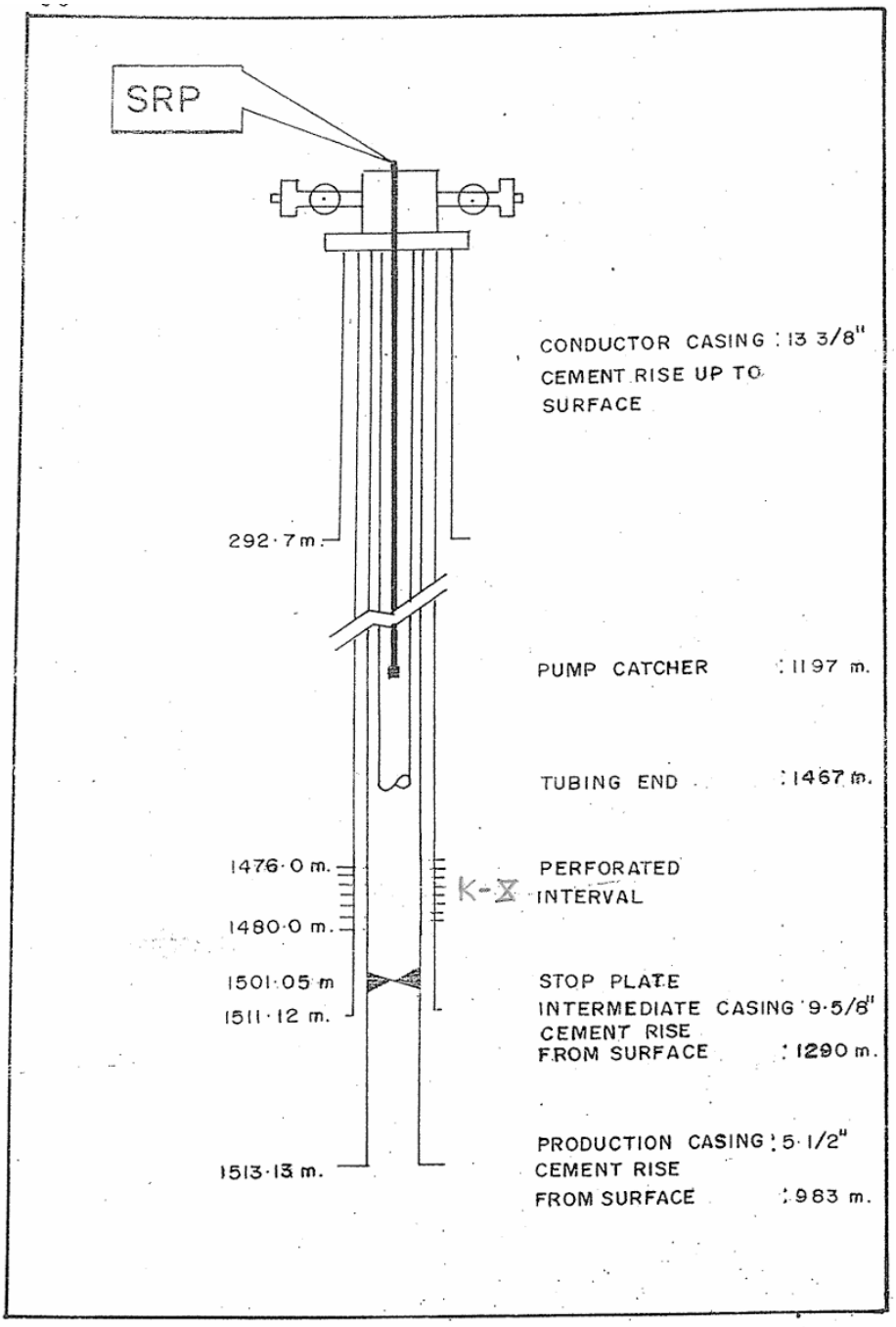
Figure 4-15: Base Map of Contract Area CB/ONDSF/CAMBAY ONLAND/2025 – OGNJ-1



4.4.1 Drilling and well completion

Key information of drilled wells has been collated and presented hereunder. The adjoining figures wherever shown illustrate the Well Construction Diagram and the Litho-column Information for key wells. Other well statics like kelly bush reference depth, water depth, drilled and logged depth including well coordinates are made available in Sections through various cross-references.

Figure 4-16: Well profile of OGNAJ-1



4.4.2 Well logging and formation evaluation

The well logs of all discovery wells along with some key wells in the contract area have been reviewed. The logs recorded in various open-hole sections along with cased-hole logs and information of conventional and other wireline formation test data are presented in this docket. The availability of key input reports like Well Completion Reports (WCR) and Formation Evaluation Report (FER) have been checked and information given. Reservoir parameters of interesting zones and results of the tested zone(s) have been included in this report. Log motifs of tested/ interesting zone of key wells are also appended.

A) Well completion and log evaluation reports availability (OGNAJ-1):

WCR/ FER availability	Spud date	KB	Drilled depth
Both available	17.02.1982	59.43 m	3000 m

B) Well logs acquired (OGNAJ -1):

Details of logs recorded in the wells are given in **Table 4-22** to **Table 4-24** below.

Table 4-22: Logs acquired in OGNAJ -1

Well No.	Type of Logs	Interval (m)
Ognaj-1	SP-NOR-2M-CAL	290-3000
	FDC	1300-1510
	FDC	2400-2960
	Neutron-GR	1350-1510
	Neutron-GR	2400-2960
	Neutron	1360-1490
	BHC-SONIC	1350-1510
	SP - CAL - LATEROLOG	1120-1500

Table 4-23: Logs acquired in OGNAJ -2

Well No.	Type of Logs	Interval (m)
Ognaj-2	SP CAL - LATEROLOG	2200-3000
	SP - MICROLOG - LATEROLOG - CAL	1350-1500
	DIL - SP	295-1600
	SP, NOR, 2M, CAL	298-1380

	CDL - CNS - GR - CAL	1300-1600

Table 4-24: Logs acquired in OGNAJ 3

Services	Date	Interval (m)	Hole Size	Casing Size	Remarks
DUAL LATEROLOG-SONIC-MSFL-SP-CALIPER-GR LOG	30.06.2011 (RUN-1)	1697–326.02			Weatherford
GR-NEUTRON-DENSITY	30.06.2011 (RUN-2)	1697–326.02			Weatherford
SWC (Side Wall Core)	01.07.2011 (RUN-3)	Attempted: 24 Cores Recovered: 22 Cores	8½"	5½"	HLS (Asia) Ltd
CBL-VDL-GR-CCL					
VSP					
Perforation					

OGNAJ-3 VSP

- PP-up 650 m source offset & 1350 m source offset VSP Image shows coverage towards E-W direction i.e. Ognaj-3 to Ognaj-1 up to 400 m 900 m at KALOL level respectively. (**Figure 4-17**)
- PP-up 1350 m source offset VSP Image shows a channels like feature at 250 m away from Ognaj-3(E to W) direction at K-IX & K-X level, but at K-X level this feature seems broader.
- PP-up 650 m source offset VSP Image shows channels like feature at K-X level 100m away towards East
- Discontinuity can be seen at around 200m & 400 m from TD on the 1350 m source VSP images, particularly on the reverse polarity version. (**Figure 4-18)**
- The channel/seismic facies variation is observed within K-IX & X pays between wells Ognaj-1 & Ognaj-3 (East to west direction). Well Ognaj-1 is falling within this channel where as well Ognaj-3 falls on the edge of the channel.
- Based on VSP results after integration of existing seismic data, identified and proposed two development locations within the channel for drilling where expecting presence of good reservoir facies.
-

Ognaj-3 VSP PP UP Image for both offset with variable area color w.r.t. offset is shown in **Figure 4-17**
Ognaj-3 VSP Imaged VSP Normal Polarity are shown in **Figure 4-18.**

Figure 4-17: OGNAJ-3 VSP PP UP Image for both offset with variable area color w.r.t. offset

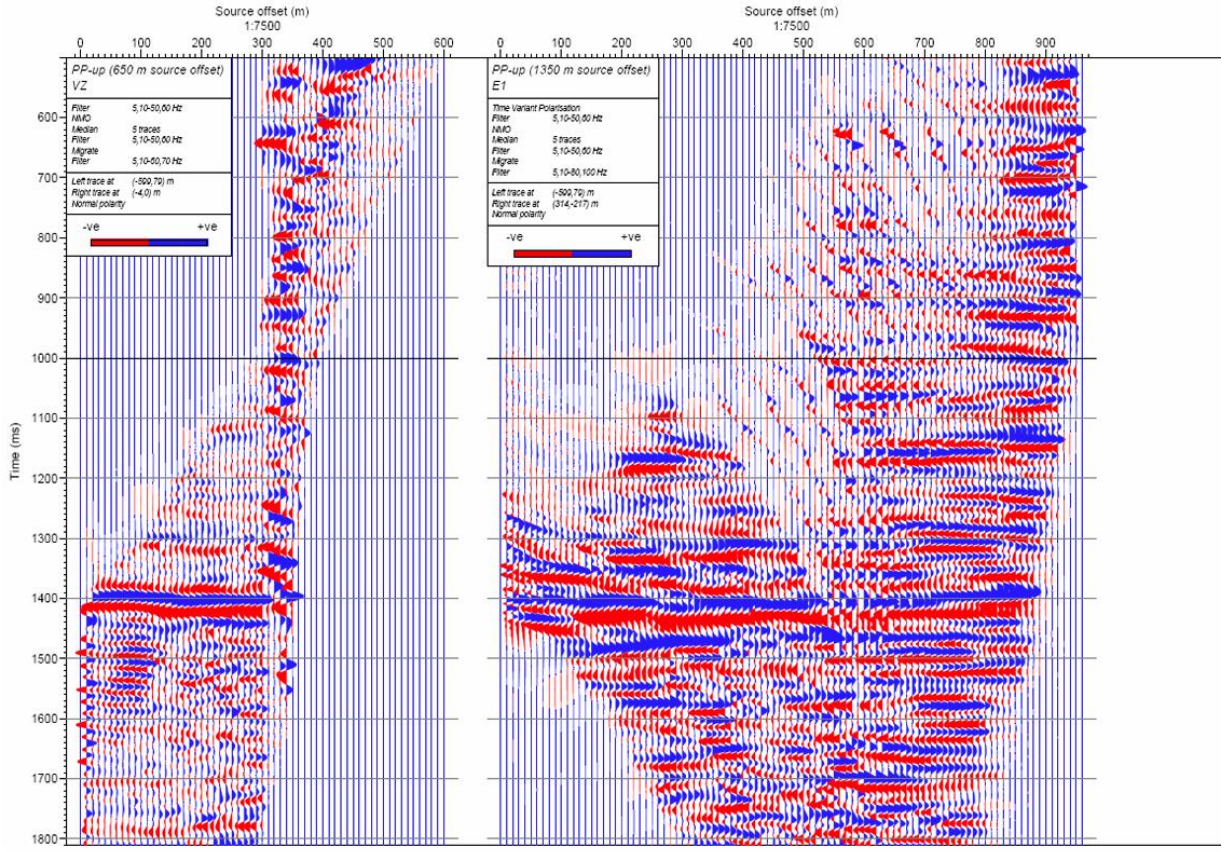
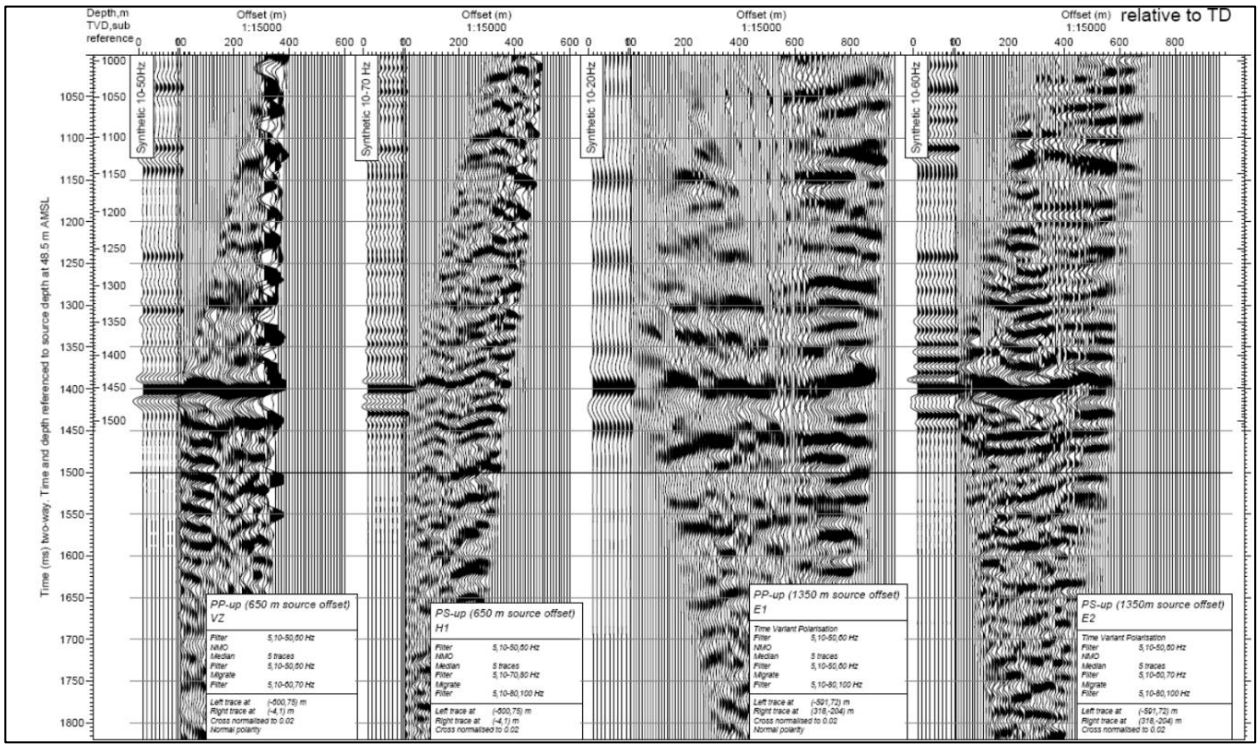
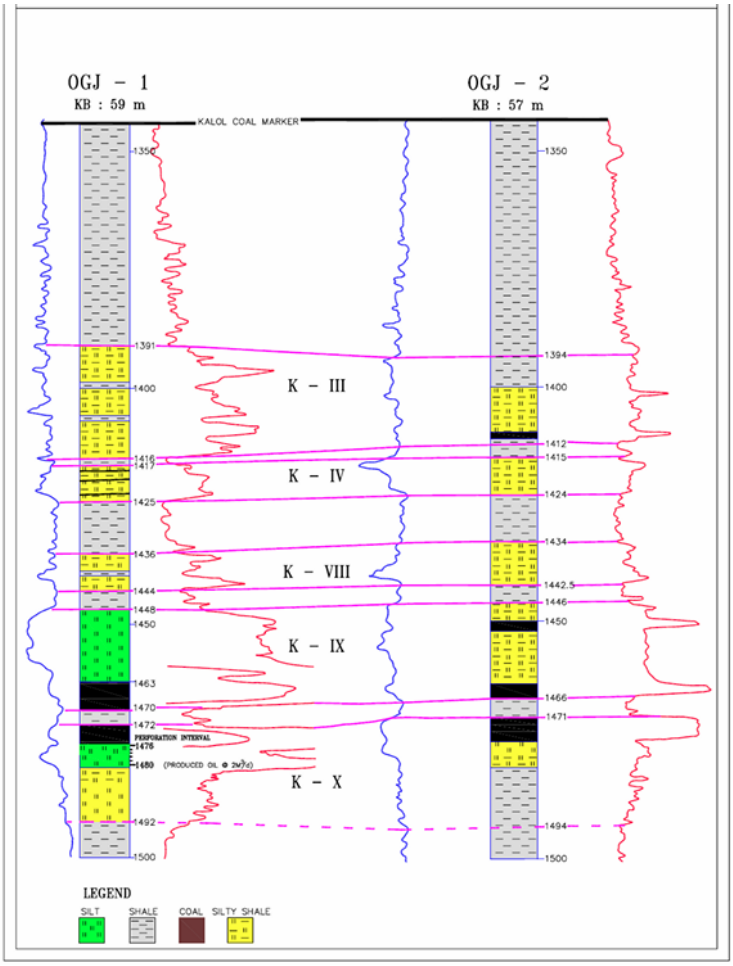


Figure 4-18: OGNAJ-3 VSP Imaged VSP Normal Polarity



Electrolog correlation of Ognaj-1 and Ognaj-2 is shown in **Figure 4-19**

Figure 4-19: Electrolog Correlation of wells OGNAJ-1 and OGNAJ-2



Stratigraphy, Wells stratigraphy and pay zone Correlation details are given as below:

Stratigraphic sequence encountered in Ognaj-1: **Table 4-25**
Generalized stratigraphic sequence: **Table 4-26**
Stratigraphic Correlation of Ognaj Wells **Table 4-27**
Pay Zone Correlation of Ognaj wells **Table 4-28**

Table 4-25: Stratigraphic sequence encountered in OGNAJ-1

Age	Formation	Thickness (m)	Lithology
Post Lower Miocene	Post Babaguru	905	Alluvium, gravel, Kankar; coarse sandstone, claystone
Lower Miocene	Babaguru	260	Coarse to medium sandstone and grey claystone
Oligocene-Late Eocene	Tarapur Shale	185	Dark grey shales with minor thin sandstone layers
Middle Eocene	Kalol	155	Siltstone, sandstone, coal, shale
Lower Eocene	Cambay Shale	990	Dark grey shales, minor siltstone
Paleocene	Olpad	515+	Trapwacke and trapwash, conglomerate, siltstone, claystone

This generalized stratigraphic sequence encountered in this well based on the well cuttings data generated during drilling & analysis of well logs is in Table **4-26**.

Table 4-26: Generalized stratigraphic sequence

S.No	Formation Name	OGJ-3 KB:58.43 m (M MD)	OGJ-1 KB:59.43 m (M MD)	OGJ-2 KB:56.73 m (M MD)
1	Post-Babaguru	0-950	0-900	0-900
2	Babaguru	950-1260	900-1160	900-1160
3	Tarapur Shale	1260-1478	1160-1343.5	1160-1376
4	Kalol	1478-1655	1343.5-1496.5	1343-1479
5	Younger Cambay Shale	1655-1697+	1496.5-1909	1494-1600+
6	Older Cambay Shale		1909-2485	
7	Olpad		2485-3000	

Stratigraphic Correlation of Ognaj Wells, viz. 1, 2 & 3 based on well log facies of these wells is given in **Table 4-27.**

Table 4-27: Stratigraphic Correlation of OGNAJ Wells

Age	Formation Name	OGJ-1 KB:59.43 m Interval (M MD)	OGJ-2 KB:56.73 m Interval (M MD)	OGJ-3 KB:58.43 m Interval (M MD)
Pliocene To Recent	Gujrat Alluvium	0-600	0-575	0.0-600.0
Upper Miocene	Jhagadia	600-730	575-725	600.0-750.0
Middle Miocene	Kand	730.0-850.0	725.0-865.0	750.0-887.0
Lower Miocene	Babaguru	850.0-1160.0	865.0-1160.0	887.0-1260.0
Upper Eocene to Oligocene	Tarapur	1160-1320.0	1160.0-1325.0	1260.0-1450.0
Middle to Upper Eocene	Kalol	1320.0-1495.0	1325.0-1492.5	1450.0-1650.0
Lower Eocene to Middle Eocene	Younger Cambay Shale	1495.0-1500.0+	1492.5-1595.0+	1650.0-1697+

Table 4-28: Pay Zone Correlation of OGNAJ wells

S.No	Pay Zones	OGJ-1 (KB:56.73 m)	OGJ-2 (KB:59.43 m)	OGJ-3 (KB:58.43 m)
		TVD(m)	TVD(m)	MD(m)
1	**Kalol Top**	1343	1343	1478
2	**K-III**	1391-1415	1391-1412	1536-1556
3	**K-IV**	1417-1425	1415-1424	1565-1578
4	**K-VIII**	1436-1444	1434-1442.5	1588-1605
5	**K-IX**	1448-1470	1446-1466	1606-1629
6	**K-X**	1472-1492	1470-1494	1629-1640

C) Well log evaluation and initial test results (OGNAJ -1):

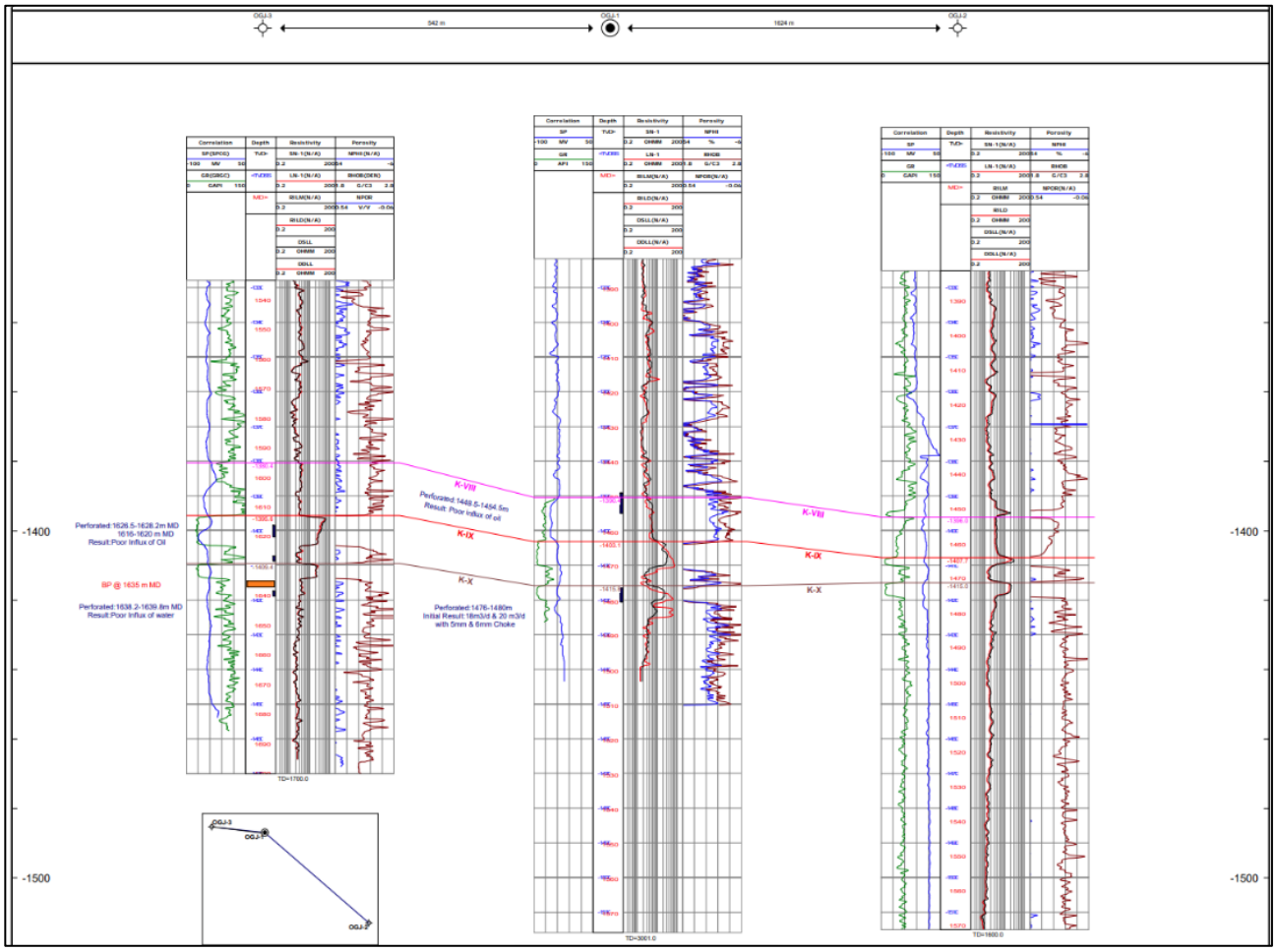
Formation evaluation of producing zone in well Ognaj-1 is given in **Table 4-29** below.

Table 4-29: Formation evaluation of OGNAJ -1

Well No.	Interval (m)	Horizon	He, m	Rt ohm.m	Ø (%)	So (%)	Remarks
OGNAJ-1	1476.0-1480.0	K-X	1.5	12.0	18	55	Oil

Log motifs of Ognaj-1, Ognaj-2 and Ognaj-3 are placed at **Figure 4-20.**

Figure 4-20: Well log motif of OGNAJ 1 OGNAJ-2 and OGNAJ-3



4.4.3 Well testing and workover history

The well Ognaj-1 was drilled in 1982 and production testing was done. Again, in September 1988 well was worked over and production testing was done with mobile SRP unit. Cumulatively it produced 18.5 m^3 oil. Testing details are given in **Table 4-30.**

Table 4-30: Testing details of **OGNAJ -1**

Well No.	Horizon	Interval (m)	Main Results
Ognaj-1	Kalol-X	1478.0-1480.0 (cased hole DST)	3.56 m^3 of oil influx in the drill string.
	Kalol-X	1476.0-1480.0 (Conventional)	Well flowed highly viscous oil @ 18 m^3/d with feeble gas through 5mm bean.

4.4.4 Reservoir engineering studies and analysis

Key reservoir engineering datasets, wherever available have been collated and presented under various data genres. In a comprehensive data presentation, the results are included from well tests, formation dynamics tests, reservoir pressure build-up study and PVT data/ results.

Formation dynamics tests (OGNAJ 1)

DST/RFT

No open hole DST/RFT was carried out in wells Ognaj-1 .

Formation in the interval 1476-1480 M was perforated after acid job and compressor application, well became active with oil and negligible gas. Bean study results and fluid parameters for Ognaj-1 are given in **Table 4-31, Table 4-32.**

Pressure readings as per DST :
Flow:Initial : 3.76 Kg/cm^2 Final: 42.17 kg/cm^2
Shut in: initial : 42.17 kg/cm$^{2.}$
Final: 157.05 kg/cm2

Table 4-31: Bean study of OGNAJ-1

Bean (mm)	FTHP (psi)	Oil rate (m³/d)	Gas	Remarks
5.0	20.0	18.0		Viscous oil with feeble gas
6.0	12.0	20.0		feeble gas

Table 4-32: Formation fluid parameters

Fluid parameters of Ognaj-1	
Current reservoir pressure (Kg/cm²)	158.4 recorded at 1420 m MSL
API gravity of oil (at 60°F)	29°
Viscosity at 45°C (cp)	62.5
Density at 15°C (g/ml)	0.8815

4.4.5 Geology and Reservoir Description of OGNAJ-1 field:

The geology of the area has been comprehensively reviewed using correlations, sections and maps. The well correlation, seismic sections, top structure, seismic attribute/amplitude and net sand/pay maps have been used to illustrate the magnitude and distribution of key reservoir properties in and around the discovered oil/gas pools (accumulations). The local tectonic setting and geological section of the area, wherever available are also given. These maps/sections are sequentially shown field-wise and reservoir unit-wise through figures, appropriately titled and illustrated in the following section.

Geological correlations, sections and maps (OGNAJ-1 field):

Ahmedabad-Mehsana tectonic: block, located in North Cambay basin is bounded in the north by Patan-Sanchor depression and in the south by Tarapur depression. This tectonic block is bounded in the east and west by basin margin faults represented by a number of steps faults, the eastern margin being more steeply faulted. Two longitudinal axial trends aligned. parallel to the axis of the basin are conspicuous in this block.· These are Sobhasan-Kalol-Ahmedabad trend in the east and the Mehsana Horst-Kadi-Jhalora-Sanand trend in the west. The major oil and gas fields in the area are located on these two axial trends.

The Ognaj structure as depicted on a time contour map on top of Kalol horizon IX and X are given on **Figure 4-21** and **Figure 4-22**. Based on evaluation of electro-facies in Ognaj-1 & 2 and Two Way Time (TWT) structure map, Ognaj-3 was drilled by SELAN.

Seismic sections along the wells : **Figure 4-23**

Figure 4-21: TWT Contour map at K-IX top

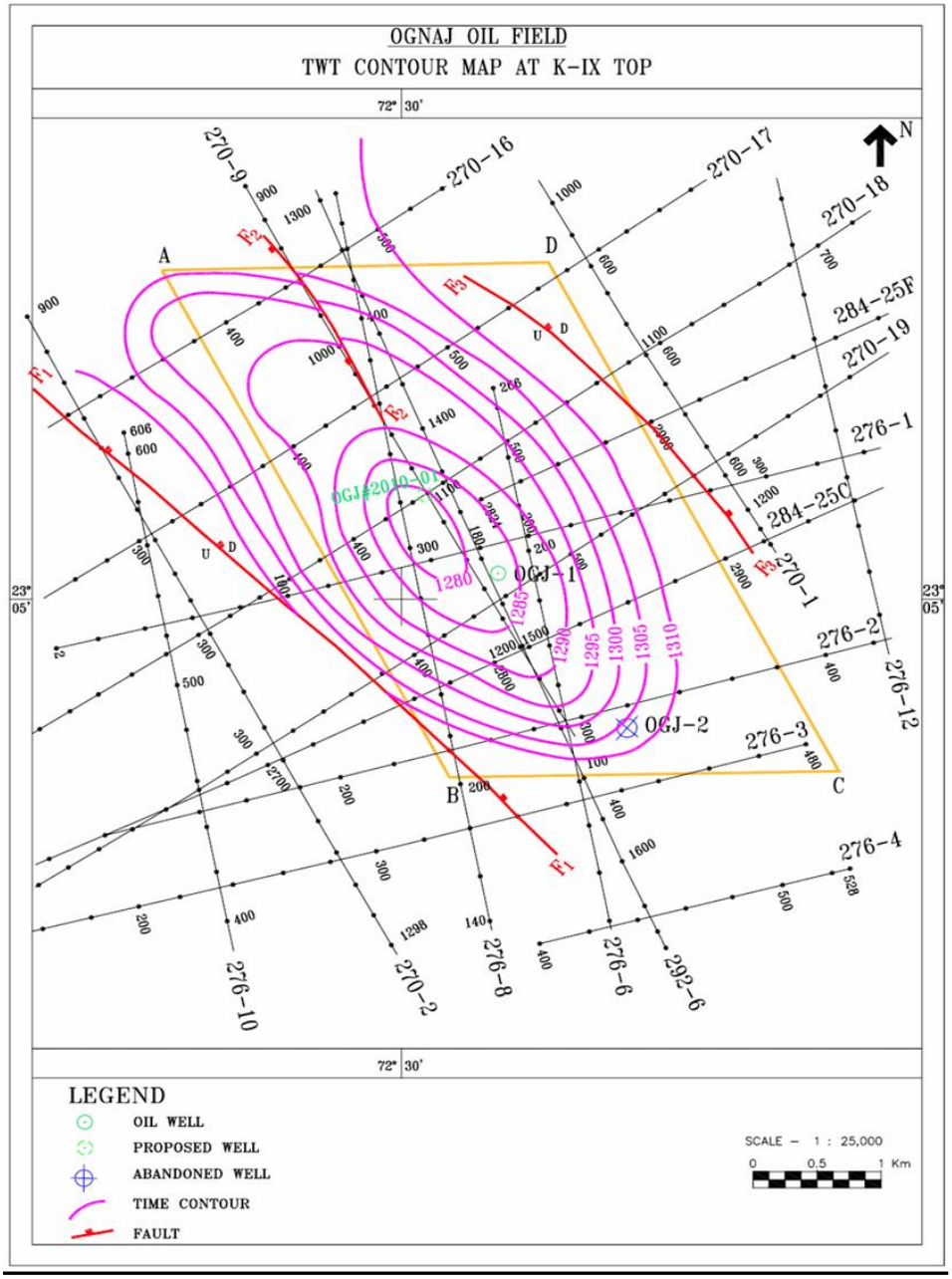


Figure 4-22: TWT Contour map at K-X top

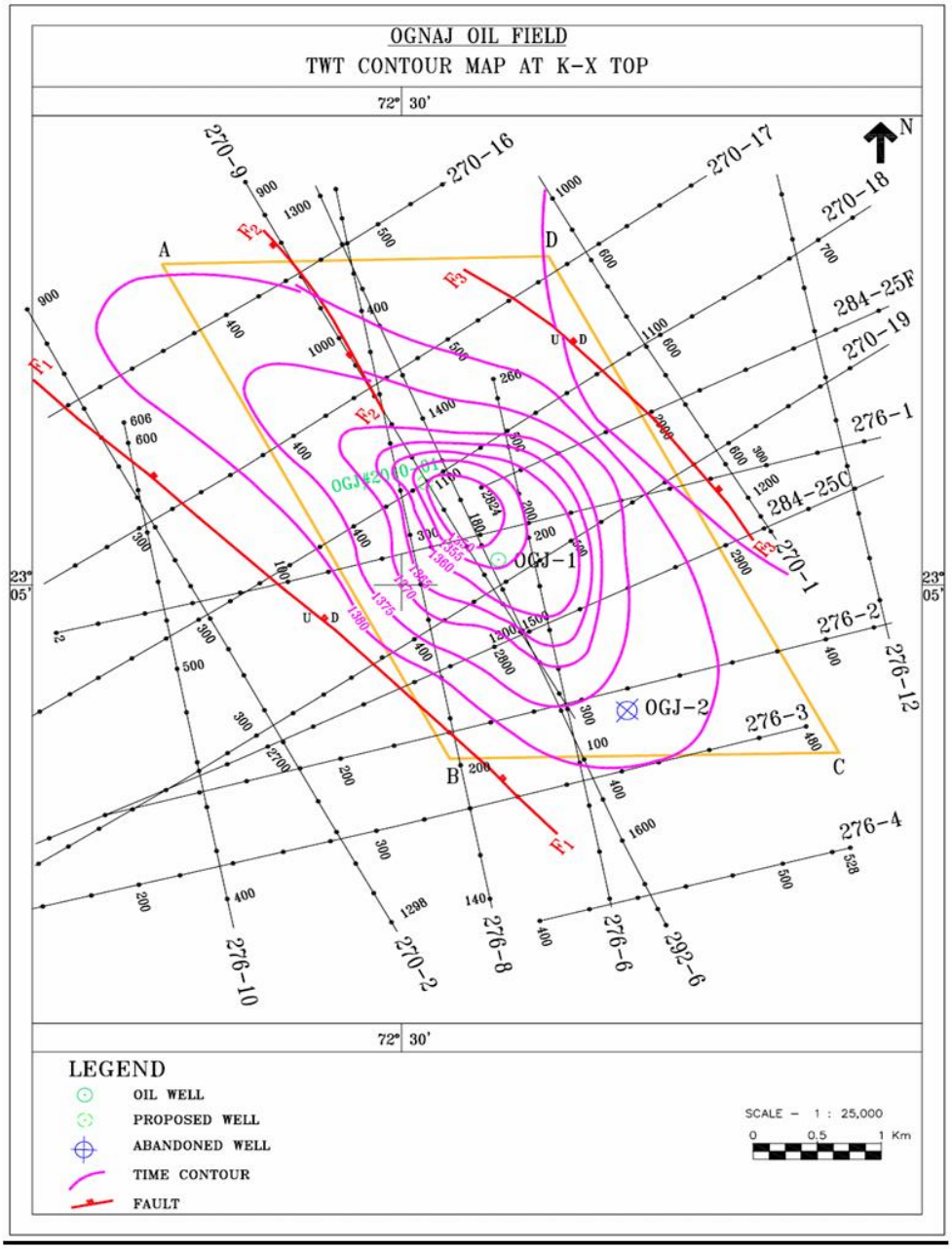
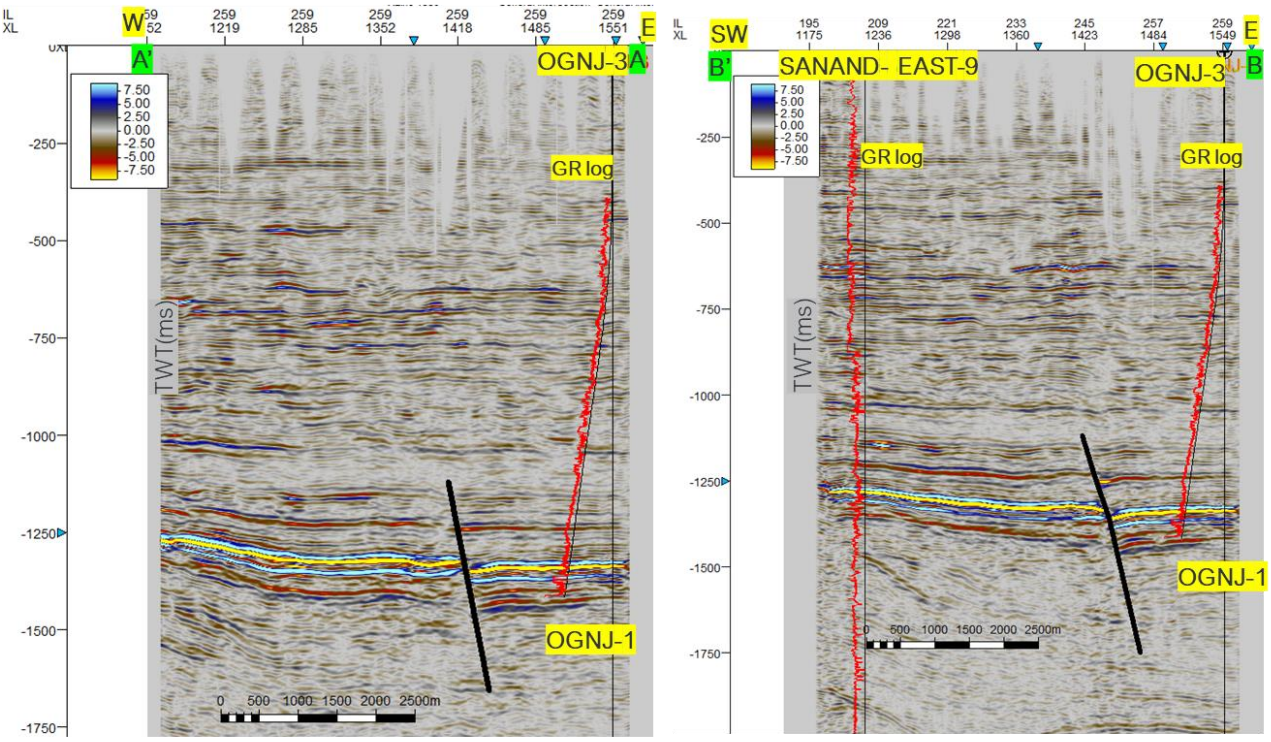
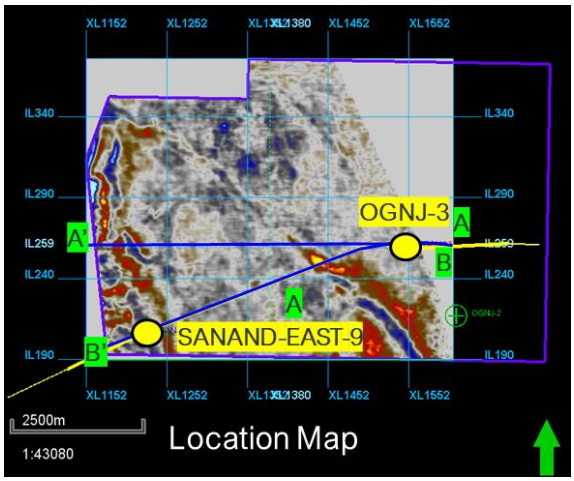


Figure 4-23: Seismic sections along the wells :



Vertical exaggeration: 5x
Seismic volume: 00001.CB-ONN-2002_3_3D_SANAND_FINAL_MIGRATION_



4.4.6 Reservoir parameters and hydrocarbon estimates (OGNAJ-1) field:

The estimates of hydrocarbon in-place have been worked out under various field assumptions, and all inputs, working and results, as available and sourced are presented in the following section.

Petrophysical parameters and wellbore estimates:

The In-Place were estimated for area around well Ognaj-1 based on the testing results of pay zone X in the same well. Oil water contact has not been established in the area.

Reservoir parameters considered for volumetric estimation and In-place are given in **Table 4-33 and Table 4-34.**

Table 4-33: Parameters for Volumetric estimation of OGNAJ-1 discovery area

Volumetric estimation of OGNAJ-1 discovery area	
Parameter	**Value**
Initial reservoir pressure	158.4 Kg/cm² @1420 m MSL
Reservoir temperature	90°C @1417 m MSL
Area, sqKm	1.256
Net Thickness, m	1.5
Average effective porosity	18%
Average hydrocarbon saturation	55%
FVF, v/v	1.14
Sp. gravity of oil	0.8815
API gravity	29°
GOR (m³/t)	22 (assumed)

Table 4-34: Volumetric estimation (2P) of OGNAJ-1 discovery area

Field	O+OEG, MMTOE
Ognaj-1	**0.15**

Erstwhile Operator-reported estimates on record:

The field has a reported hydrocarbon estimate (O+OEG) of **0.11 MMTOE**.

All these hydrocarbon estimates are subject to future assessments based on Operator's own technical insights and additional information/data, which may warrant possible revision of the currently reported estimates.

4.4.7 Production Facility for Oil and Gas Evacuation:

Production facilities do not exist at Ognaj-1. After testing the well with mobile SRP unit in September 1988 the well was closed. The well is fitted with downhole assembly of SRP (rods and pump). Depth of pump catcher is 1197 m.

Near-by surface Facility with distance: Jhalora GGS-II, approx. 22 kms.

CAMBAY ONSHORE UBER-2 FIELD

4.5 DESCRIPTION OF CAMBAY ONSHORE UBER-2 FIELD

The well UBER-2 (UBAC) is a vertical exploratory well drilled up to 4504 m depth (Logger's depth), with the objective to explore the hydrocarbon potential of Hazad, Olpad and Trap in Western Onshore Basin. The well is located towards NNE of Jambusar-5, WNW of Jambusar-25 (JMAQ) and WSW of Jambusar-19 (JMAK).

The co-ordinates of the endpoints defining the block boundary are tabulated below in **Table 4-35**. Surrounding wells to UBER-2 location and seismic coverage of the block are given in **Figure 4-24 and Figure 4-25.**

Table 4-35: Co-ordinates of the endpoints defining the block boundary

	UBER-2 Boundary Points		
	Area: 25.38 sq km		
	Point	**Longitude**	**Latitude**
	A	72°44'0.000" E	22°12'0.000" N
	B	72°47'0.000" E	22°12'0.000" N
	C	72°47'0.000" E	22°10'0.000" N
	D	72°46'0.000" E	22°10'0.000" N
	E	72°46'0.000" E	22°09'0.000" N
	F	72°44'0.000" E	22°09'0.000" N
	A	72°44'0.000" E	22°12'0.000" N
SL. No.	**Well**	**Longitude**	**Latitude**
1	UBER-2	72°45'37.724" E	22°10'22.798" N

Figure 4-24: Location map of UBER-2

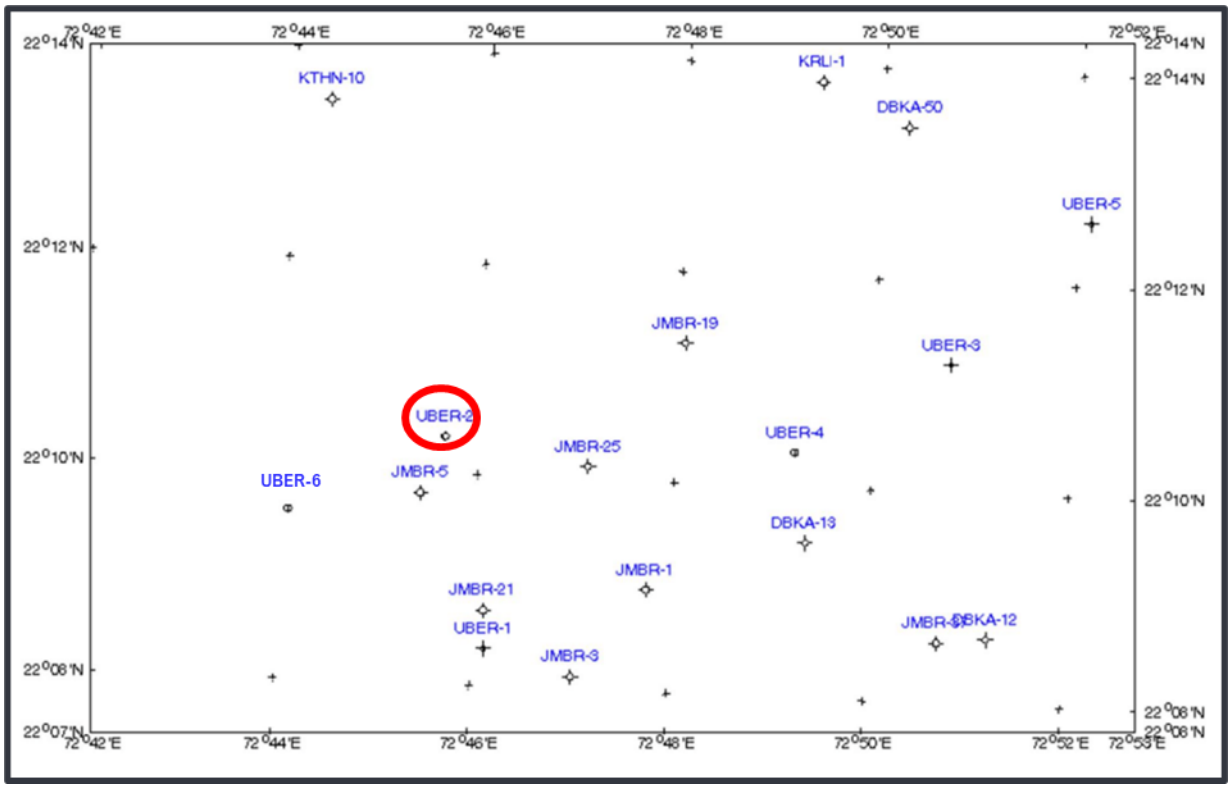
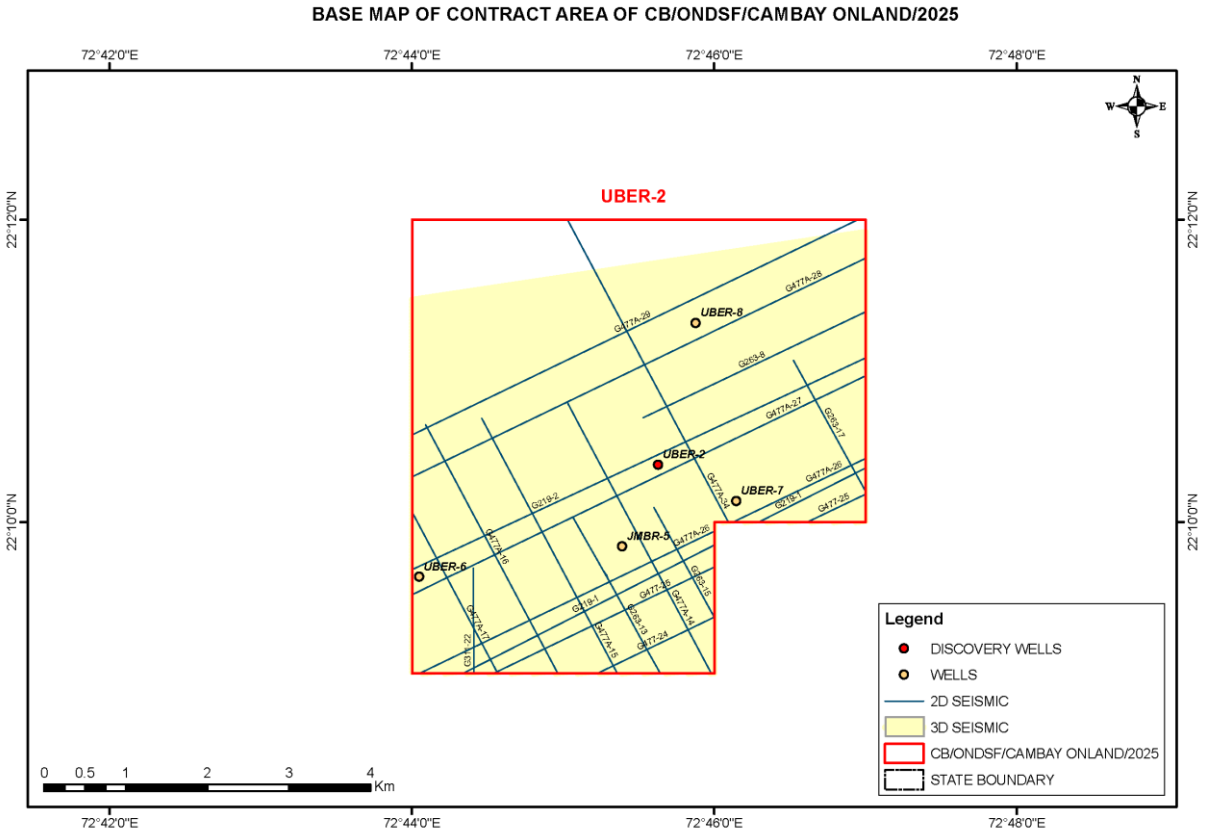


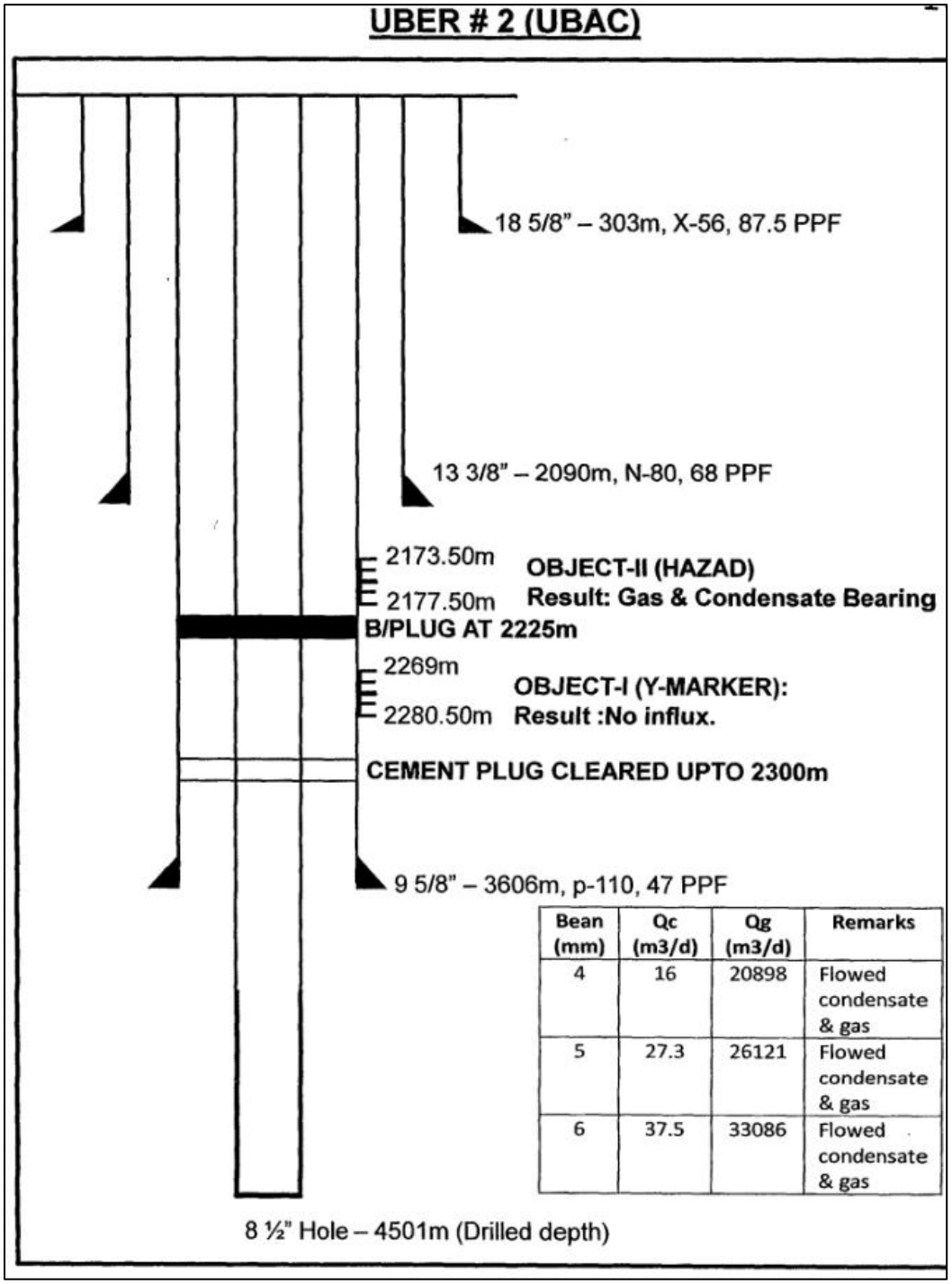
Figure 4-25: Seismic coverage in UBER-2 area



4.5.1 Drilling and well completion

Key information of drilled wells have been collated and presented hereunder. The adjoining figures wherever shown illustrate the Well Construction Diagram and the Litho-column Information for key wells. Other well statics like kelly bush reference depth, water depth, drilled and logged depth including well coordinates are made available in Sections through various cross-references.

Figure 4-26: Well profile of UBER-2



Bean (mm)	Qc (m3/d)	Qg (m3/d)	Remarks
4	16	20898	Flowed condensate & gas
5	27.3	26121	Flowed condensate & gas
6	37.5	33086	Flowed condensate & gas

Figure 4-27Figure 4-27: Litho-section of UBER-2

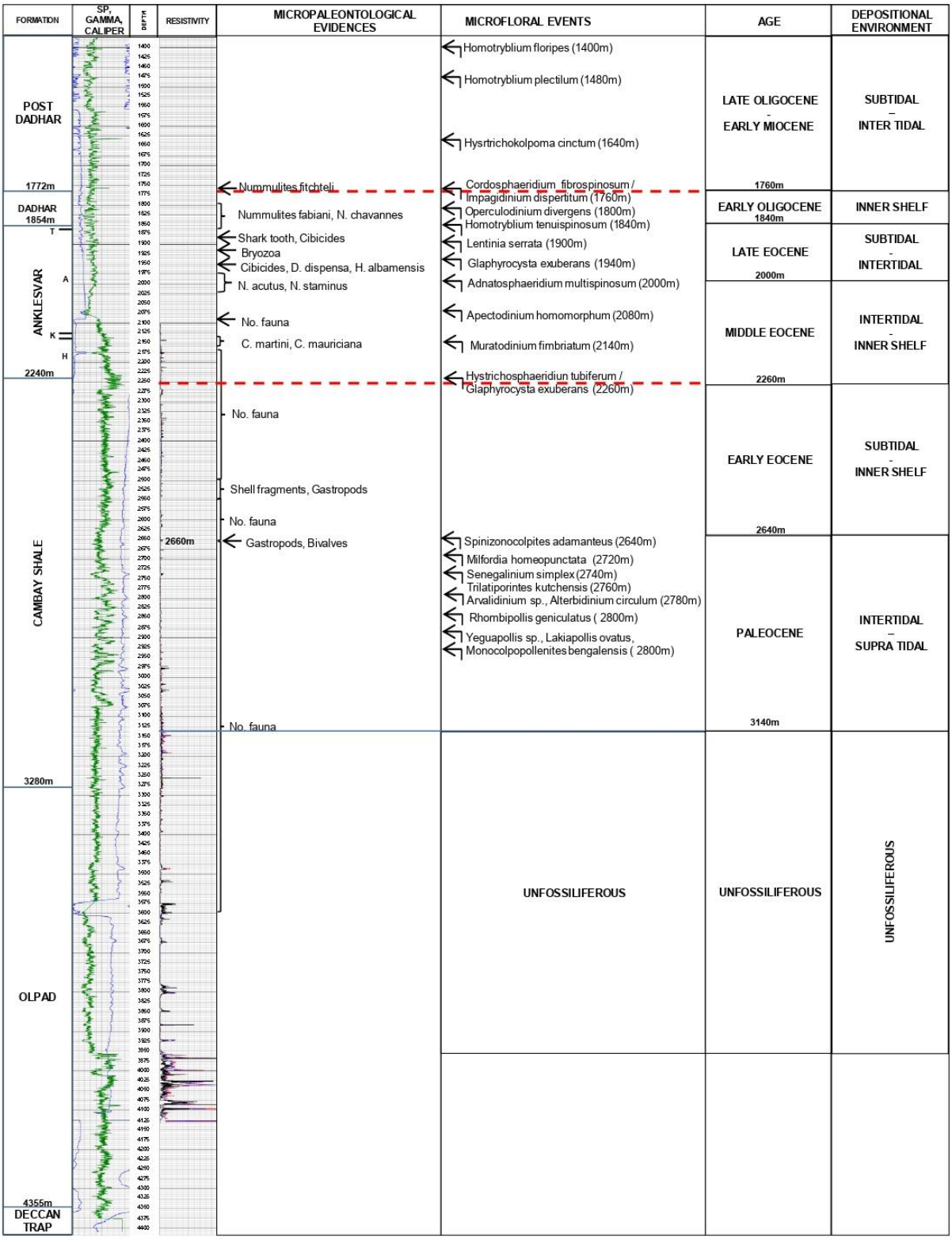


Fig. 3 : Biochronstratigraphic anlaysis, age and depositional environment in Well Uber#2.

Table 4-36: Status of drilled wells in UBER area

Sl. No	WELL	DEPTH TVD (m)	DEPTH MD (m)	Date of Spudding	Date of Completion / Date of Rig Release	Status
1	**UBER-1**	3750	3750	03.01.2010	03.06.2010	Abandoned
2	**UBER-2**	4501	4501	03.07.2011	31.01.2012	Gas and Condensates
3	**UBER-3**	3213	3213	15.03.2012	26.06.2012	Abandoned with oil indication
4	**UBER-4**	3221	3221	13.01.2012	25.03.2012	Abandoned
5	**UBER-5**	2531	2531	21.03.2012	05.05.2012	Abandoned
6	**UBER-6**	2982	2982	09.04.2012	05.09.2012	Abandoned with oil indication
7	**UBER-7**	2900	3074	20.08.2014	05.12.2014	Abandoned with little oil
8	**UBER-8 (UBAA-1)**	2900	3434	10.10.2014	03.02.2015	Abandoned-Oil indication with poor /no influx in GS-6 sand

4.5.2 Well logging and formation evaluation

The well logs of all discovery wells along with some key wells in the contract area have been reviewed. The logs recorded in various open-hole sections along with cased-hole logs and information of conventional and other wireline formation test data are presented in this docket. The availability of key input reports like Well Completion Reports (WCR) and Formation Evaluation Report (FER) have been checked and information given. Reservoir parameters of interesting zones and results of the tested zone(s) have been included in this report. Log motifs of tested/ interesting zone of key wells are also appended.

A) Well completion and log evaluation reports availability (UBER-2) :

WCR/ FER availability	Spud date	KB	Drilled depth
WCR & FER available	03.07.2021	15.39 m	4501 m

Logs suites recorded in well UBER-2 **Table 4-37**. And conventional cores cut given in **Table 4-38.**

B) Well logs acquired (UBER-2)

Table 4-37: Logs acquired in UBER-2

Logs	Interval (m)	Remarks
HDIL-SP-GR	301m-2090m	**ONGC UNIT**
DAL-GR	301m-2082m	
ZDEN-CN-G R-CAL	301m-2088m	
HDIL-SP-GR	2463.5m - 2089.0m	**ONGC UNIT** Rm = 0.085 ohm.m @ 96 degF Rmf = 0.050 ohm.m @ 80 degF Rmc = 0.110 ohm.m@ 81.9 degF Max Recorded Temp. 212 deg F
ZDL-CN-GR- CAL	466m-2089m	**ONGC** UNIT Rm= 0.085 ohm.m@ 96 degF Rmf = 0.050 ohm.m @ 80 degF Rmc = 0.110 ohm.m @ 81.9 degF Max Recorded Temp. 212 deg F
MDT-GR (Pretest and Sampling)	2429.2-2129m	SCHLUMBERGER UNIT Carried out pretest at 13 points and two samples were collected from depths 2175m and 2176.2m
DLL-MSFL-CALI-GR-SP	3581.0-2088.4m	HLS UNIT Salinity : 79200 mg/l as Nacl Rm= 0.09 ohm.m @ 94.00 deg F Rmf = 0.06 ohm.m @ 92.00 deg F Rmc = 0.35 ohm.m @ 92.00 deg F Max. Recorded Temp= 300°F
SDL-DSN-G R-CALI	3581.0-2088.4m	HLS UNIT: Salinity : 79200 mg/l as Nacl Rm= 0.09 ohm.m @ 94.00 deg F Rmf = 0.06 ohm.m @ 92.00 deg F Rmc = 0.35 ohm.m @ 92.00 deg F Max. Recorded Temp= 302°F
CSNG-GR	3581.0-2088.4m	HLS UNIT: Rm= 0.09 ohm.m @ 94.00 deg F Rmf = 0.06 ohm.m @ 92.00 deg F Rmc = 0.35 ohm.m @ 92.00 deg F Max. Recorded Temp= 302°F
FMI-GPIT-GR	3520.0- 2100.0m	SCHLUMBERGER UNIT:

MSDIPS		Rm = 0.11 ohm.m @ 85.9 degF Rmf =0.69 ohm.m @ 84.6 degF Rmc = 0.53 ohm.m @ 83.9 degF Max Recorded Temp= 300°F
CMR-GR	3525.0 - 2130.00 m	SCHLUMBERGER UNIT: Rmc = 0.530 ohm.m @ 29 degC Rmf = 0.690 ohm.m @ 29 degC Rm:= 0.110 ohm.m @ 30 degC Maximum Recorded Temp= 300°F
DSI-GR	3576.40-2090.00m	SCHLUMBERGER UNIT: Rm= 0.11 ohm.m @ 85.9 degF Rmf = 0.69 ohm.m @ 84.6 degF Rmc = 0.53: ohm.m @ 83.9 degF Max Recorded Temp : 300 °F
MDT-GR (Pretest and Sampling)	3516.5-2175. 7m	SCHLUMBERGER UNIT Carried out pretest at 10 points and one ' sample was collected from 2175.72m depth.
SWC	2140-3516.5m	**ONGC** UNIT Attempted: 24; Recovered: 20 Misfired: 2; Lost barrel; Empty barrel: 1
CBL-VDL	2050-3606m	ONGC UNIT
VSP	2400-180m	ONGC UNIT
DLL-MSFL-GR-SP-CAL	4121.48-3607.2m	SCHLUMBERGER UNIT: Rm= 0.140 ohm.m @ 30 deg C Rmf = 0.073 ohm.m @ 31 deg C Rmc = 0.149ohm.m@ 24 deg C Max Recorded Temp: 171 °C
lOL-CNL-GR-CAL	4127-3607 .2m	SCHLUMBERGER UNIT: Rm= 0.140 ohm.m @ 30 deg C Rmf = 0.073 ohm.m @ 31 deg C Rmc = 0.149ohm.m @ 24 deg C Max Recorded Temp : 175 °C
		SCHLUMBERGER UNIT:
		Rm=0.128 ohm.m @ 29 deg C
QAIT-QTGC	4397-3850m	Rmf = 0.065 ohm.m @ 30 deg C Rmc = 0.242ohm.m @ 29 deg C
		Max Recorded Temp: 177 °C
QLDT-QCNT-QTGC	4378.64-3975m	SCHLUMBERGER UNIT: Rm= 0.128 ohm.m @ 29 deg C Rmf = 0.065 ohm.m@ 30 deg C Rmc = 0.242ohm.m@ 29 deg C Max Recorded Temp: 177 °C
QSLT-QTGC	4386.69-3600m	SCHLUMBERGER UNIT: Rm= 0.128 ohm.m @ 29 deg C Rmf = 0.065 ohm.m @ 30 deg C Rmc = 0.242ohm.m @ 29 deg C Max Recorded Temp: 177 °C
QAIT-QTGC	4501-4350m	SCHLUMBERGER UNIT: Rm= 0.134 ohm.m @ 20 deg C Rmf = 0.067 ohm.m @ 19 deg C Rmc = 0.322ohm.m @ 21 deg C Max Recorded Temp : 183 °C
QLDT-QCNT-QTGC	4482.64-4350m	**SCHLUMBERGER UNIT:** Rm= 0.134 ohm.m@ 20 deg C Rmf = 0.067 ohm.m @ 19 deg C Rmc = 0.322ohm.m @ 21 deg C Max Recorded Temp *:* 183 °C
QSLT-QTGC	4471.46-4350m	SCHLUMBERGER UNIT: Rm= 0.134 ohm.m@ 20 deg C Rmf = 0.067 ohm.m @ 19 deg C Rmc = 0.322ohm.m @ 21 deg C Max Recorded Temp *:* 183 °C
SWC	4376-3628m	**HLS UNIT:** Attempted: 24; Recovered: 17 Washed out: 04; Lost barrel: 03-

Table 4-38: Conventional Cores cut in UBER-2

Core No	Interval (m)	Recovery %	Formation / Member	Lithology and shows
CC-1	2182–2191m	21.50%	ARDOL	Siltstone and Silty Shale; Specky GYF / Moderate to Very strong cut
CC-2	2267–2276m	9.11%	HAZAD	Silt-stone and silty shale; Specky Golden Yellow Fluorescence / Strong cut

CC-3	2513.5–2519.5m	100%	HAZAD	Silt-stone and silty shale – NF/NC
CC-4	3100–3106m	98.66%	CAMBAY SHALE	Shale and Sandstone – NF/NC

Stratigraphic sequence in UBER-2: **Table 4-39**
Stratigraphic correlation of UBER-2 with adjacent wells: **Table 4-40.**

Pay zone correlation of well UBER-2 with nearby wells: **Table 4-41**

Table 4-39: Stratigraphic sequence in UBER-2

STRATIGRAPHY: (Depths are in meter, Depths within bracket are in MSL)				
AGE	**FORMATION**	**MEMBER**	**UBER#2 (UBAC) KB : 15.39m**	**Thickness (m)**
MIOCENE TO RECENT	POST DADHAR	ALLUVIUM, JAMBUSAR & BROACH	00-1772m (00-1757m)	1757
		JHAGADIA		
		KAND		
		BABAGURU		
		TARKESHWAR		
OLIGOCENE	DADHAR		1772-1920m (1757-1905m)	148
MIDDLE TO LATE EOCENE	ANKLESHWAR	TELWA	1920-1925m (1905-1910m)	5
		ARDOL	1925-2130m (1910-2115m)	205
		KANWA	2130-2142m (2115-2127m)	12
		HAZAD	2142-2240m (2127-2225m)	98
EARLY TO MIDDLE EOCENE	CAMBAY SHALE (YCS)		2240-2660m (2225-2645m)	420
	CAMBAY SHALE (Y-MARKER)		2267-2287m (2252-2272m)	20
	CAMBAY SHALE (OCS)		2660-3282m (2645-3267m)	622
PALEOCENE	OLPAD		3282-4355m (3267-4340m)	1073
EARLY CRETACEOUS	DECCAN TRAP		4355-4501m+ (4340-4486m+)	146+

Table 4-40: Stratigraphic correlation of UBER-2 with adjacent wells

STRATIGRAPHIC CORRELATION WITH ADJACENT WELLS									
Age	Formation	Member	Uber #2 (UBAC) KB: 15.39m	Uber # 8 (UBAA) KB:12.72m L-Profile	Uber #7 (UBAI) KB : 15.39m S-Profile	Uber #6 (UBAG) K.B:18.10m	UBER # 1 (UBAB) KB : 20.35m	JMBR # 5 KB: 18.35m Vertical	JMBR # 25 KB: 14.91m Vertical
Miocene to Recent	Post Dadhar		00-1772m (00-1757m)	00-2031m (MD) 00-1739m (TVD-KB) 00-1726.28m (TVD-MSL)	00-1853m 00-1776.5m (TVD-KB) 00-1761m (TVD-MSL)	00-1793m (00-1774.90m)	0-1770 (0-1749.65)	0-1784 (0-1766)	0-1760 (0-1745)
Oligocene	Dadhar		1772-1920m (1757-1905m)	2031-2213m (MD) 1739-1899m (TVD-KB) 1726.28-1886.24m (TVD-MSL)	1853-2015m 1776.5-1918m (TVD-KB) 1761-1902m (TVD-MSL)	1793-1924m (1774.90-1905.90m)	1770-1968 (1749.65-1947.65)	1784-1925 (1766-1907)	1760-1988 (1745-1973)
Middle to Late Eocene	Ankleshwar	Telwa	1920-1925m (1905-1910m)	2213-2222.5m (MD) 1899-1907m (TVD-KB) 1886.24-1894.27m (TVD-MSL)	2015-2025m 1918-1927.5m (TVD-KB) 1903-1912m (TVD-MSL)	1924-1936 (1905.90-1917.90m)	1968-1980 (1947.65-1959.65)	1925-1938 (1907-1920)	1988-1998 (1973-1983)
		Ardol	1925-2130m (1910-2115m)	2222.5m - 2463m (MD) 1907m - 2100 (TVD-KB) 1894.27m - 2087.28 (TVD-MSL)	2025-2268m 1927.5-2154m (TVD-KB) 1912-2139m (TVD-MSL)	1936-2198m (1917.90-2179.90m)	1980-2189 (1959.65-2168.65)	1938-2145 (1920-2127)	1998-2138 (1983-2123)
		Kanwa	2130-2142m (2115-2127m)	2463 - 2474.5m (MD) 2100 - 2109m (TVD-KB) 2087.28 - 2096.24m (TVD-MSL)	2268-2279.5m 2154-2165m (TVD-KB) 2139-2150m (TVD-MSL)	2198-2206m (2179.90-2187.90m)	2189-2198 (2168.65-2177.65)	2145-2156 (2127-2138)	2138-2150 (2123-2135)
		Hazad	2142-2240m (2127-2225m)	2474.5 - 2595.5m (MD) 2109 - 2205m (TVD-KB) 2096.24 - 2192.22 (TVD-MSL)	2279.5-2386m 2165-2264m (TVD-KB) 2150-2249m (TVD-MSL)	2206-2317m (2187.90-2298.90m)	2198-2289 (2177.65-2268.65)	2156-2280 (2138-2242)	2150-2251 (2135-2236)
Early to Middle Eocene	Cambay shale (YCS)		2240-2660m (2225-2645m)	2595.5 - 2622.5m (MD) 2205 - 2226.5 (TVD-KB) 2192.28 - 2213.78 (TVD-MSL)		2317-2753m (2298.90-2734.90m)	2289-2811 (2268.65-2790.65)	2260-2701+ (2242-2682.65)	2251-2304+ (2236-2289)
	Cambay Shale (Y' Marker)		2267-2287m (2252-2272m)	2622.5 - 2640m (MD) 2226.5 - 2241m (TVD-KB) 2213.78 - 2228.28 (MSL)	2279.5-3074m+ 2165-2900m+ (TVD-KB) 2150-2885m+ (TVD-MSL)	2338-2355.50m (2319.90-2337.40m)	2348-2368 (2327.65-2347.65)		Not Drilled
	Cambay Shale (OCS)		2660-3282m (2645-3267m)	2640 - 3143m (MD) 2241 - 2667.5m (TVD-KB) 2228.28 - 2654.78 (TVD-MSL)		2753-2987m+ (2734.90-2968.90m+)	2811-3540 (2790.65-3591.65)		Not Drilled
Paleocene	Olpad		3282-4355m (3267-4340m)	3143 - 3433+ (MD) 2667.5 - 2900m+ (TVD-KB) 2654.78 - 2887.28 (TVD-MSL)	Not Drilled	Not Drilled	3540-3750+ (3591.65-3729.65+)	Not Drilled	Not Drilled
Early Cretaceous	Weathered Trap / Deccan Trap		4355-4501m+ (4340-4486m+)	Not Drilled	Not Drilled	Not Drilled	Not Drilled	Not Drilled	Not Drilled

Depths are in meter; depths given in brackets are in TVD &MSL

Table 4-41: Pay zone correlation of well UBER-2 with nearby wells

PAY ZONE CORRELATION OF WELL UBER#8 (UBAA) WITH NEARBY WELLS							
Sand	**UBER #2 (UBAC) KB : 15.39m**	**UBER#8 (UBAA) K.B.:12.72m**	**UBER#7 (UBAI) KB : 15.39m**	**UBER#6 (UBAG) K.B.:18.10 m**	**UBER#1 (UBAB) KB : 20.35m**	**JMBR#5 KB : 15.39m**	**JMBR#25**
GS-9	2159-2162.5m (2143.6-2147.1m)	2127.5 - 2131.5m TVD (2114.78 – 2118.78m)	2178.5-2181.5m TVD (2163-2166m)	Not developed	2227-2232m (2207-2212m)	2174-2179 (2156-2161)	2167-2178.5 (2152-2164)
GS-8	2163-2165m (2147.6-2149.6m)	Not developed	2182.5-2185m (2167-2170m)	Not developed	2237-2241m (2217-2221m)	2183-2185 (2165-2167)	2184 - 2186 (2169.09 - 2171.09)
GS-6	2173.5-2177.5m (2158.1-2162.1m)	2140 – 2144.5m (TVD) (2123.28 – 2131.78m)	2193.5-2199m (2178-2184m)	2248-2251.50m (2229.90-2233.50m)	2245-2257.5m (2225-2237.5m)	2188-2205 (2170-2187)	2190 - 2193 (2175.09 - 2178.09)
Y-marker	2267-2287m (2252-2272m)	2226.5 – 2240m (TVD) (2131.78 – 2227.28m)	2288-2308m (2273-2293m)	2338-2356.5 (2319.9-2337.4)		2287-2313 (2268.65-2294.65)	2284 - 2305 (2269 - 2290)

*All depths within parentheses are in MSL.

C) Well log evaluation and initial test results (UBER-2):

- The well U**BER**-2 (UBAC) is structurally up at all the levels as compared to Jambusar-5 and Jambusar-25 (JMAQ).
- In the Hazad Member the layer developed in the interval 2173 - 2179 m having good reservoir facies is evaluated as hydrocarbon bearing with water saturation 58-62% and effective porosity 14-22%.
- The Y - Marker developed in the interval 2269 – 2280.5 m of Younger Cambay Shale (YCS) is highly shaly with water saturation 80-90% and effective porosity 8-12%.
- The Olpad and Trap Formations are not interesting from hydrocarbon point of view.
- As per FMI log Ankleshwar Formation and upper part of Younger Cambay Shale (YCS) show dip magnitude 4 - 11 degrees and dip azimuth towards E to SE. Older Cambay Shale (OCS) show dip magnitude 3 - 27 degrees and dip azimuth towards NE to E. Olpad Formation show dip magnitude 5 -21 degrees and dip azimuth towards SW direction. 2173 - 2179 m (Hazad) was recommended for testing in this well. Intervals were identified for testing in this well: Object-I: 2269-2280.5 m (Y-Marker), Object-II: 2173.5-2177.5 m (Hazad)

Details of initial testing in UBER-2 are given in **Table 4-42.**

Table 4-42: Initial testing details of UBER-2

Initial Testing Results of UBER-2

Object	**I**	**II**
Horizon Name	**Y-Marker**	**Hazad**
Interval (m)	2269-2280.5	2173.5-2177.5
Testing Date	16 - 20 Jan 2012	21 - 27 Jan 2012
Perforation Type	Conventional	Conventional
Shot Density (SPM)	18	18
Activation Type	Compressor (N_2)	Self
Bean Size (mm)	-	4, 5 & 6
Oil Flow Rate (m^3/Day) / Amount	-	-
Flow Rate - Gas (m^3/Day)	-	• Gas: 20,898 m^3/d and Condensate: 16 m^3/d (through 4 mm bean) • Gas: 26,121 m^3/d and Condensate:27.3 m^3/d (through 5 mm bean) • Gas: 33,086 m^3/d and Condensate:37.5 m^3/d (through 6 mm bean)
Water Cut	-	Yes
GOR	-	-
FTHP/CHP (psi)	-	1875/2000 (with 4 mm bean) 1850/2100 (with 5 mm bean) 1900/2050 (with 6 mm bean)
STHP/CHP (psi)	-	2160/2160

Salinity (gpl)	2.97, 3.795 & 1.32	-
Oil Gravity (API)	-	-
Status	**No Influx**	**Gas and Condensate bearing**

Log motifs of Object-I and Object-II are shown in **Figure 4-28 and Figure 4-29.**

Figure 4-28: Well log motif of UBER-2 Object-I

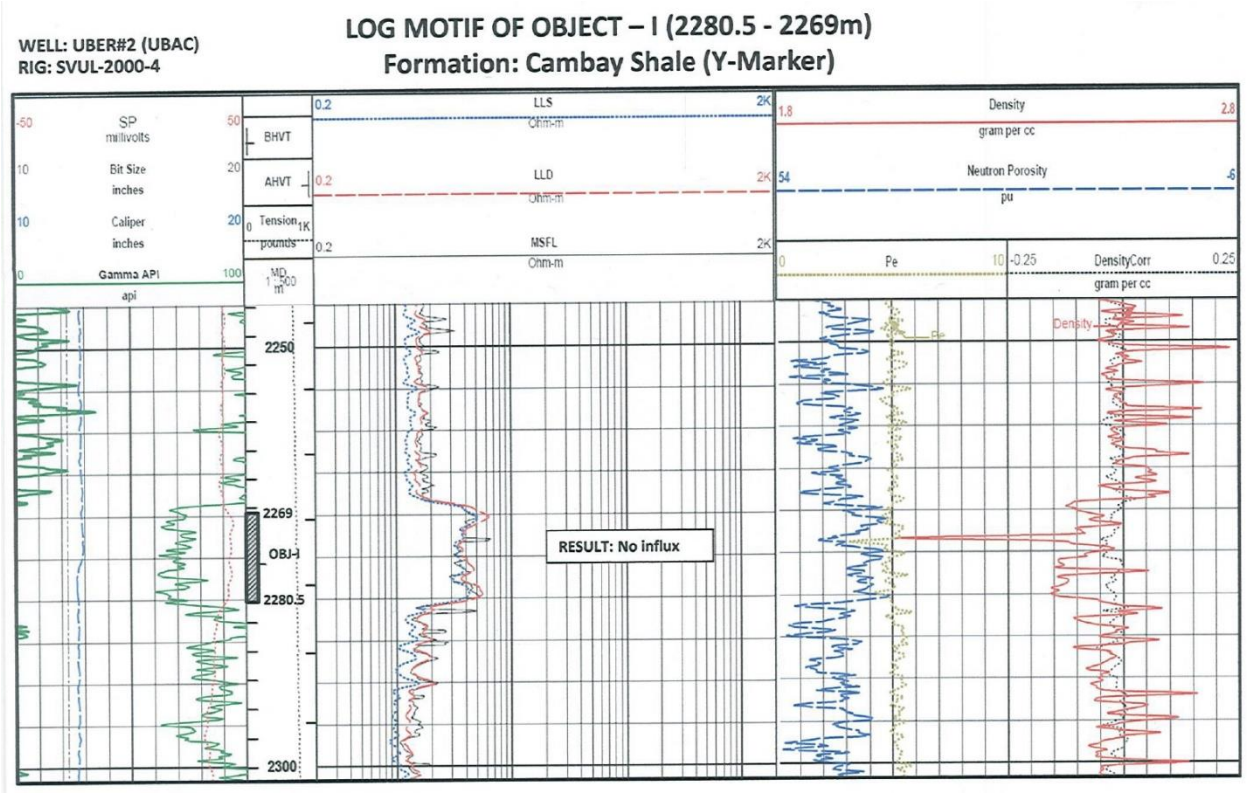
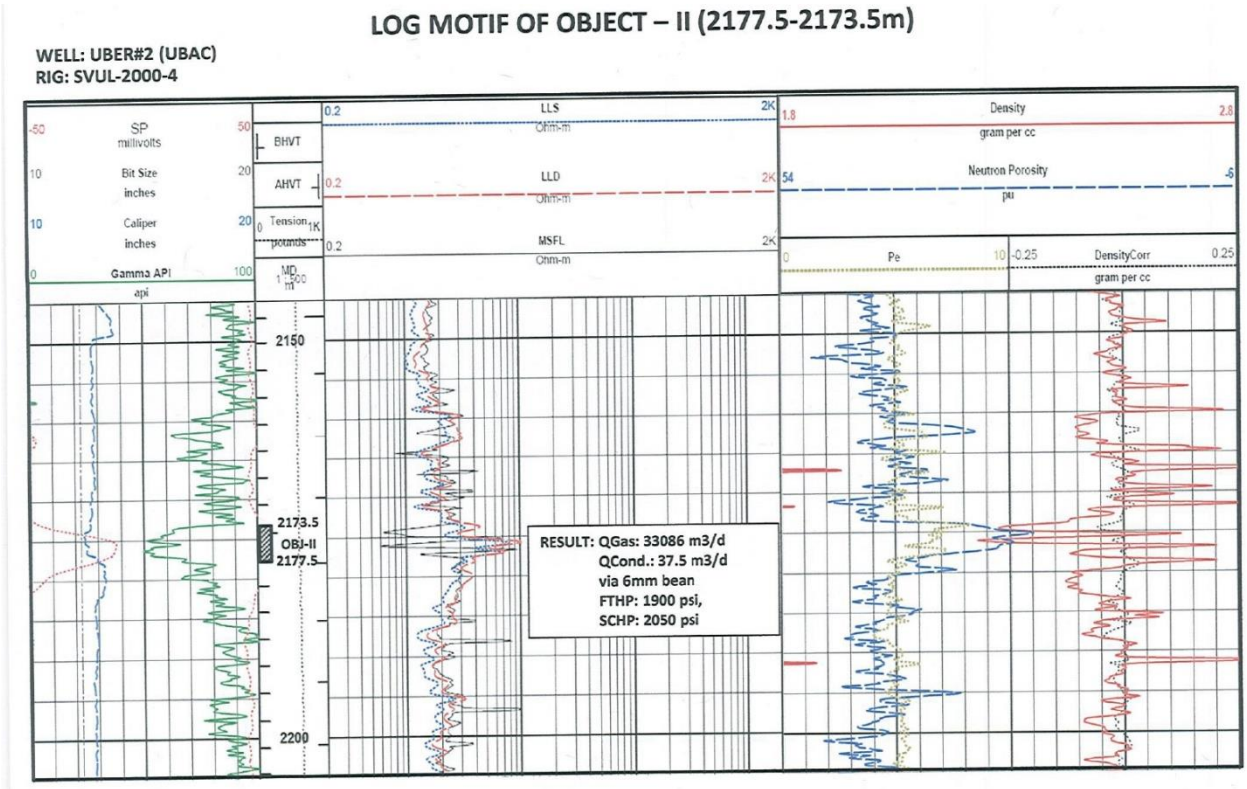


Figure 4-29: Well log motif of UBER-2 Object-II



4.5.3 Well testing and workover history

Following intervals were identified for testing in this well:

Object-I: 2269-2280.5 m (Y-Marker)

Object-II: 2173.5-2177.5 m (Hazad)

Object-I: 2269-2280.5 m (Y-Marker) –The interval was perforated conventionally with 18 SPM. Nitrogen was applied up to 150 ksc and flow of technical water with salinity 2.97 gpl was observed. Again nitrogen was applied up to 180 ksc and water with salinity 3.795 gpl was observed. Well was closed under pressure. Again nitrogen was applied from 150 to 195 ksc and water with salinity 1.32 gpl was observed. BHS was carried out up to 2200 m. No liquid level was found. This status of this object was declared as No influx.

Object-II: 2173.5-2177.5 m (Hazad) –The interval was perforated conventionally with 18 SPM. While changing over to water well became active with water and gas. Flow of light oil with little water and gas was observed. Multi bean study was performed. Gas flow rate was 20,898 m3/d and condensate flow rate was 16 m3/d through 4 mm bean. With 5 mm bean gas flow rate was 26,121 m3/d and condensate flow rate was 27.3 m3/d. With 6 mm bean gas flow rate was 33,086 m3/d and condensate flow rate was 37.5 m3/d. PVT sampling was carried out. Thereafter well was closed for 48 hours for build-up study. STHP and SCHP, both were found 2160 psi. This object was declared as gas and condensate bearing.

Main results and their details of production testing of Object-I and Object-II of UBER-2 are given in **Table 4-43 and Table 4-44.**

Table 4-43: Main results of testing of UBER-2

MAIN RESULTS:								
Obj	**Interval (m)**	**Formation / Member**	**Result**					**Remarks**
			Bean (mm)	**Qc (m3/d)**	**Qg (m3/d)**	**FTHP psi**	**CHP psi**	
I	**2280.5-2269**	Cambay Shale (Y-marker)	No influx					Isolated by setting B/plug at 2225m by wire line
II	**2177.5-2173.5**	Ankleshwar/ Hazad	4	16	20898	1875	2000	Gas & condensate bearing in Hazad Sand
			5	27.3	26121	1850	2100	
			6	37.5	33086	1900	2050	

Table 4-44: Testing details of UBER-2 Object-II

TESTING DETAILS OF OBJECT-II (2177.5-2173.5m) OF WELL UBER -2 (UBAC)								
Date	**Operation**	**Bean (mm)**	**Liquid type**	**Qi (m3/d)**	**Qg (m3/d)**	**FTHP (PSI)**	**CHP (PSI)**	**Remarks**
21.01.2012	B/P setting by wire line at 2225m to isolate Obj-I followed by perforation of Obj-II (2177.5-2173.5m). R/I 2 7/8" Tbg down to 2148.73m.							
22.01.2012	Changed over to water. While changing over, observed well became active with water & gas. K/out water via 8 mm bean. Changed over to 6mm bean. Observed light oil with little water & gas coming out.							Well under cleaning. Not stabilized. Sal: 25.5 / 11.3 / 7.5 gpl (Tech Water Sal: 2.47gpl)
	K/out	6	Cond with little water & gas	---	---			Well under cleaning. Not stabilized. Changed over to 4mm.
23.01.2012	Well flowing under observation	4	Cond & gas	15	20898	1875	2000	
24.01.2012	Multi bean study	4	Cond & gas	16	20898	1875	2000	
24.01.2012		5	Cond & gas	27.3	26121	1850	2100	
25.01.2012		6	Cond & gas	37.5	33086	1900	2050	
25.01.2012	PVT sampling carried out by IRS. Closed well at 1600 hrs on 25.01.12 for 48 hrs build up study							**Well under Build Up Study**
26/27.01.12	48 hrs Build up study completed at 1600 hrs on 27.01.2012							
27.01.2012	Shut in pressure study	6	Well closed	--	--	SBHP: 219.45 KSC @ 2120m		Reservoir study completed. Opened well & handed over for subduing
27.01.2012 To 29.01.2012	Subdued the well with 1.37 Sp. Gr. mud							

Composite log, FMI, DSI and CMR against Hazad member in UBER-2 are shown in **Figure 4-30.** Composite log against Y-marker in UBER-2 is shown in **Figure 4-31.**

Figure 4-30: Composite log, FMI, DSI and CMR against Hazad member in UBER-2

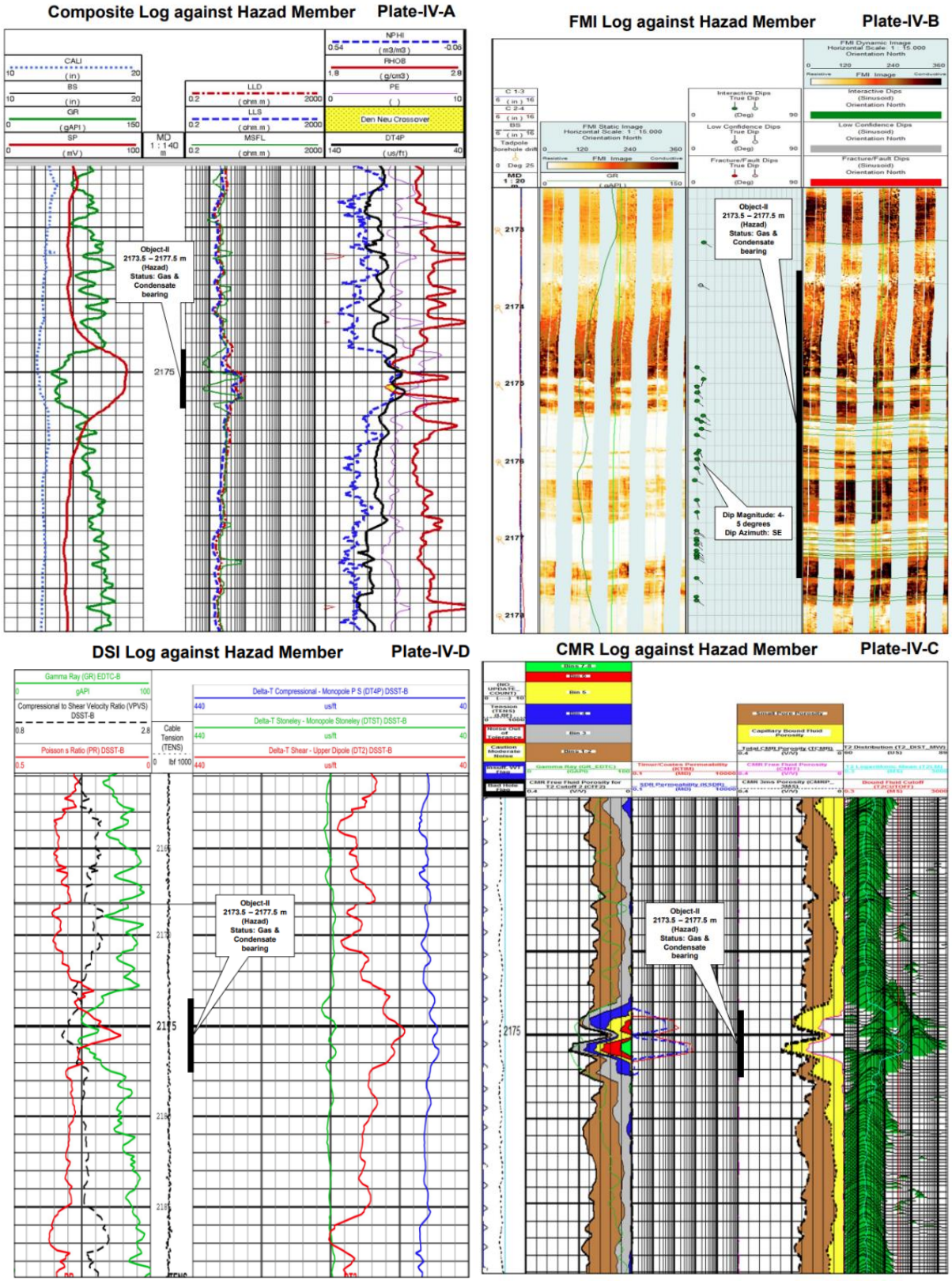
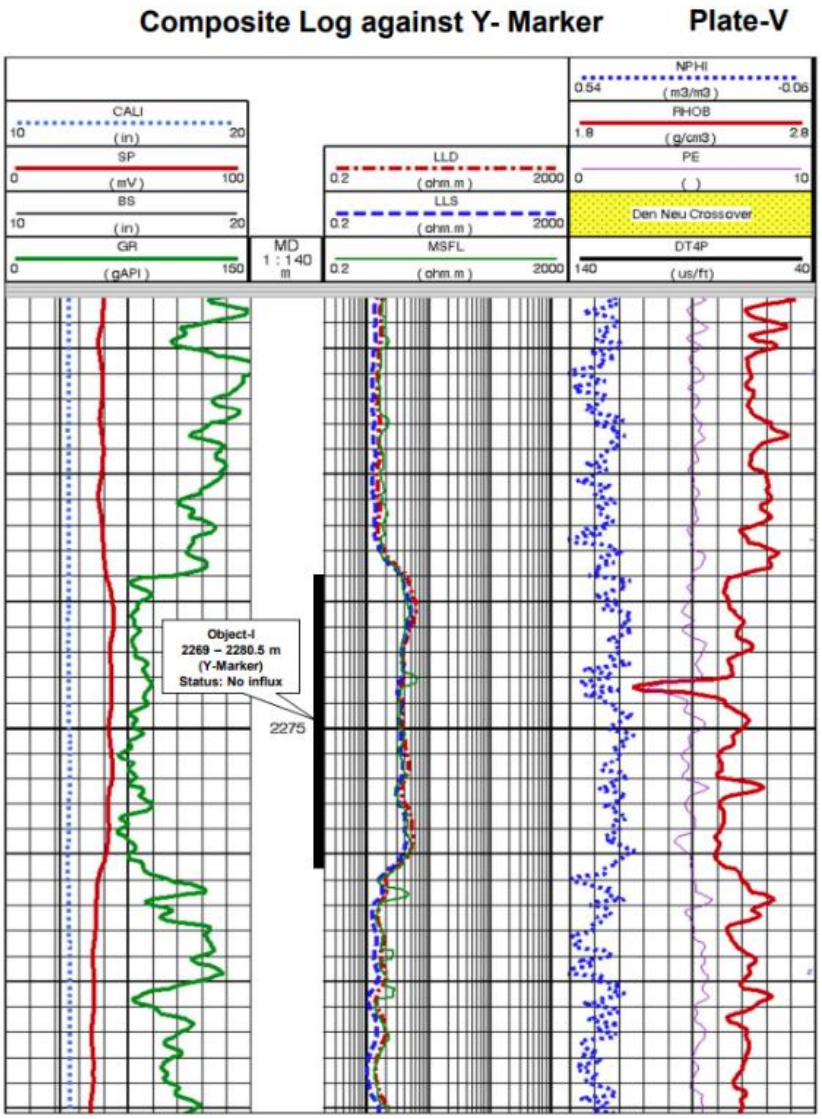


Figure 4-31: Composite log against Y-marker in UBER-2



4.5.4 Reservoir engineering studies and analysis

Key reservoir engineering datasets, wherever available have been collated and presented under various data genres. In a comprehensive data presentation, the results are included from well tests, formation dynamics tests, reservoir pressure build-up study and PVT data/ results.

Formation dynamics tests (UBER-2):

MDT pressure tests of Object-II and Object-I of UBER-2 are tabulated in **Table** 4-45 **and Table 4-46**. Sampling details during MDT are given in **Table 4-47.**

Table 4-45: MDT PRESSURE TEST in UBER-2 Object-II

Run#	Test	Depth (m)	Drawdown Mobility MD/CP	Mud Pressure Before PSIA	Mud Pressure After PSIA	Last Read Build-up Pressure PSIA	Formation Pressure (PSIA)
Run#1	1.	2175	23.8	4113.94	4113.93	3346.07	3346.07
Run#1	2.	2176.2	248.3	4118.09	4117.31	3346.59	3346.59
Run#2	1.	2175.72	76.21	4905.33	4911.59	3346.25	3346.25
Run#2	2.	2176.2	248.3	4118.09	4117.31	3346.59	3346.07

Table 4-46: MDT PRESSURE TEST in UBER-2 Object-I

Sl No:	Depth (m)	TVD (m)	Drawdown Mobility MD/CP	Mud Pressure Before (PSIA)	Mud Pressure After (PSIA)	Last read build-up Pres (PSIA)	Formation Pressure (PSIA)	Test Type
1	3516.54	3516.54	0.01	7874.05	7876.08	3569.84	3569.84	Tight test
2	3486.04	3486.04	0.00	7805.41	7811.59	4998.24	4998.24	Tight test
3	3034.33	3034.33	0.01	6807.08	6817.85	5231.07	5231.07	Tight test
4	3032.55	3032.55	0.01	6814.73	6818.76	4875.27	4875.27	Tight test
5	2976.51	2976.51	-	6683.40	6687.37	-	-	Lost Seal
6	2976.01	2976.01	0.01	6687.67	6692.65	4151.82	4151.82	Tight test
7	2954.52	2954.52	0.01	6641.73	6644.32	3275.42	3275.42	Tight test
8	2918.50	2918.50	-	6558.23	6562.55	2928.72	2928.72	Tight test
9	2737.02	2737.02	0.00	6150.04	6155.39	3224.78	3224.78	Tight test
10	2661.51	2661.51	0.01	5981.90	5986.88	3162.40	3162.40	Tight test

Table 4-47: MDT PRESSURE TEST & SAMPLE DATA :

Run#	Sr. No.	Depth (m)	Chamber size	Chamber opening pressure (psi)	Liquid quantity	Type of Liquid	Salinity (GPL)	Rm Ohm-m	Rmf Ohm-m	Max Recorded Temp
Run#1	1	2175	3.75lt	1200	1.75 lt	Condensate with water Condensate : 01 ltr Water : 0.75 ltr	25	0.091@83 deg F	0.080@83 deg F	240 degF
Run#1	2	2176.2	10 lt	400	3.5 ltr	Condensate : 3 ltr Water : 0.50 ltr	35			
Run#2	1	2175.7	3.75lt	4500	1.2 lt	Condensate : 0.5 lt Mud filtrate : 0.7 lt	54	0.11@85. 9 deg F	0.69@	
Run#2	2	2175.7	10 lt		3.5 lt	Condensate : 1.8 lt Mud filtrate : 1.7 lt	54		84.6 deg F	290 degF

Run#1 Mud filtrate Salinity: 34 gpl, MW: 1.29, VISC: 59,
Run#2 Mud filtrate Salinity: 49 GPL MW: 1.29, VISC: 59

BHS details of UBER-2 Object-II (2173.5-2177.5), GS-6 sand of Hazad

LL: Flowing, Gradient: 0.64 Ksc/10m @2120m, SBHP: 219.45 Ksc @2120m, Sample: Gas & Condensate, Temp: 115.9DegC.
API of liquid at 15.5DegC: 59.59,
Liquid density at 15.5 DegC: 0.7398 gm/cc
Separator gas gravity: 0.8430

Gas composition analysis (UBER-2) :

Results of Gas Chromatogram giving gas composition is given in **Table 4-48**.

Table 4-48: Gas Chromatogram details

Run#	Sr. No	Depth (m)	Chamber opening pressure (psi)	Gas Quantity (cuft)	Total Gas (%)	C1	C2	C3	iC4	nC4	iC5	nC5
Run#1	1	2175	1200	11.5	5.16	3.20	0.62	0.21				
Run#1	2	2176.2	400	43	7.02	4.35	0.84	0.28	0.35	0.49		
Run#2	1	2175.72	1200	11.5	93.71	38.66	-	4.45	0.48	-	-	-
Run#2	2.	2176.2	400	43	7.02	4.35	0.84	0.28	0.35	0.49		

The PVT sample collected was analysed in the laboratory. Results of Constant Volume Depletion Study at 126.8oC are tabulated in **Table 4-49**. Cum Gas Production & Cum Hydrocarbon Recovery at different pressures is given in **Table 4-50.** Retrograde liquid dropout volume vs. pressure is shown in **Figure 4-32.**

Table 4-49: PVT parameters UBER-2 from Constant Volume Depletion Study at 126.8°C

Pressure psig	Pressure kg/cm²	Gas FVF (Bg)	Inverse of Gas FVF (1/Bg)	Gas Gravity	Gas Deviation Factor(Z)
2500	175.77	0.0068	146.42	0.8889	0.8431
2000	140.62	0.0085	118.34	0.8807	0.8357
1500	105.46	0.0119	84.14	0.8802	0.8837
1000	70.31	0.0185	54.07	0.8955	0.9213
500	35.15	0.0384	26.06	0.9281	0.9695
0	0.00	1.3857	0.72	0.9851	1.0000

Table 4-50: Cum Gas Production & Cum Hydrocarbon Recovery at different pressures

Pressure (psig)	Pressure (kg/cm²)	Cumulative Gas Production (cc)	Cumulative Hydrocarbon Recovery (% wt/wt)
2500	175.77	1669	11.72
2000	140.62	3219	22.85
1500	105.46	4759	33.60
1000	70.31	6354	44.75
500	35.15	7868	55.79
0	0.00	9491	72.21

Figure 4-32: Constant Volume Depletion Study : Pressure vs. Retrograde Liquid

Results of PVT study:

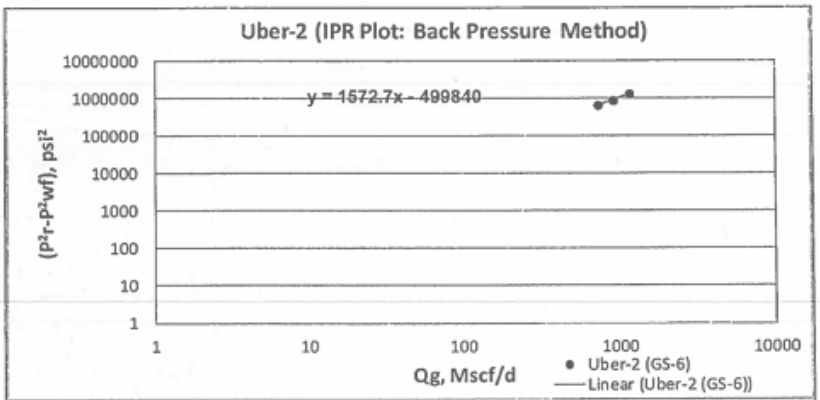
- The sample exists in gaseous phase at reservoir conditions and condensation takes place during depletion.

- Dew point pressure is observed at 2917 psig during CME study at reservoir temperature.
- The maximum liquid dropout in CME study at reservoir temperature is around 20.4% of hydrocarbon volume at 2778 psig, and the condensate build-up is quite sudden and the shape of the liquid drop out curve indicates the sample behaving more as "Near critical gas condensate system".
- The Molar % of C7+ of well stream composition is 7.24% (<12.5 mole%). The oAPI of the liquid at 15.5°C is measured as 59.6. The fluid falls in the category of a gas condensate.
- During CVD study, the liquid segregation is 20.24% of reservoir volume at 2500 psig and reduction of liquid volume to 12.70% of reservoir volume at 500 psig. The liquid does not vaporize completely up to atmospheric pressure and the residual liquid is 7.13% of reservoir volume.

AOFP analysis of UBER-2

Absolute Open Flow Potential (AOFP) plot of UBER-2 given in Figure 4-33.

Figure 4-33: AOFP analysis of UBER-2



	AOFP	20% of AOFP	25% of AOFP	30% of AOFP
Mscf/d	6513	1303	1628	1954
m^3/d	184417	36883	46104	55325
		35000	45000	55000

From PTA Report of Uber-2 (UBAC)

	AOFP	13% of AOFP	17% of AOFP	20% of AOFP	25% of AOFP	30% of AOFP
m^3/d	154600	20098	25509	30920	38650	46380
		20000	25000	30000	40000	45000

AOFP Analysis of Uber-2

4.5.5 Geology and Reservoir Description of UBER-2 field:

The geology of the area has been comprehensively reviewed using correlations, sections and maps. The well correlation, seismic sections, top structure, seismic attribute/amplitude and net sand/pay maps have been used to illustrate the magnitude and distribution of key reservoir properties in and around the discovered oil/gas pools (accumulations). The local tectonic setting and geological section of the area, wherever available are also given. These maps/sections are sequentially shown field-wise and reservoir unit-wise through figures, appropriately titled and illustrated in the following section.

Geological correlations, sections and maps (UBER-2 field):

The Synthetic seismogram is shown below.

Figure 4-34: Well to seismic Tie UBER-2

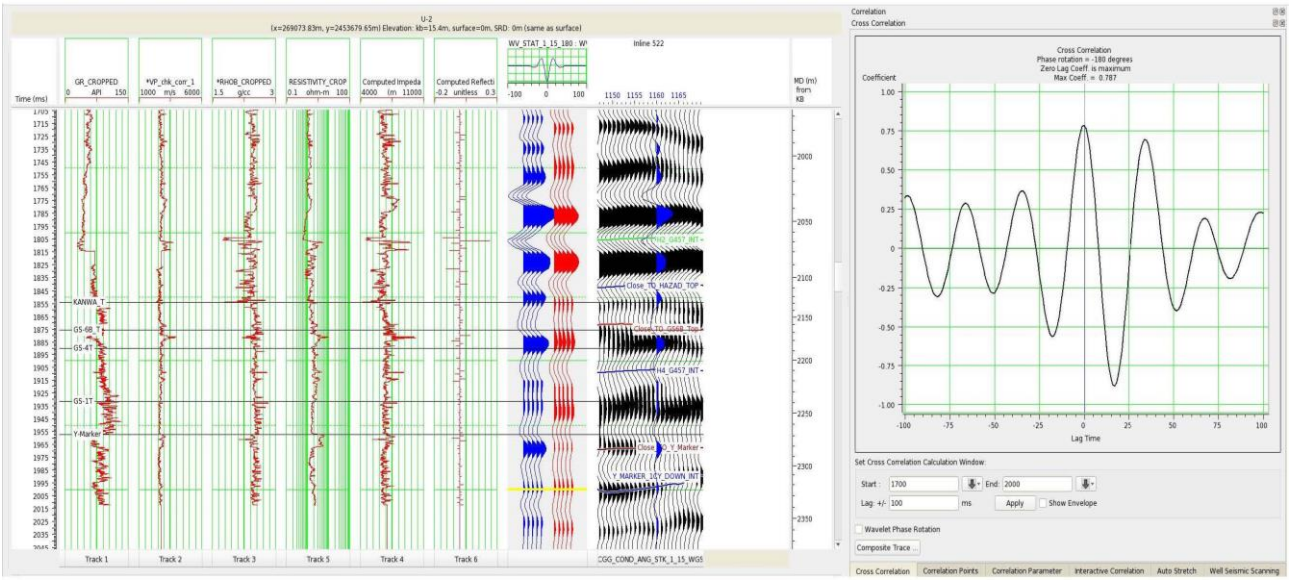


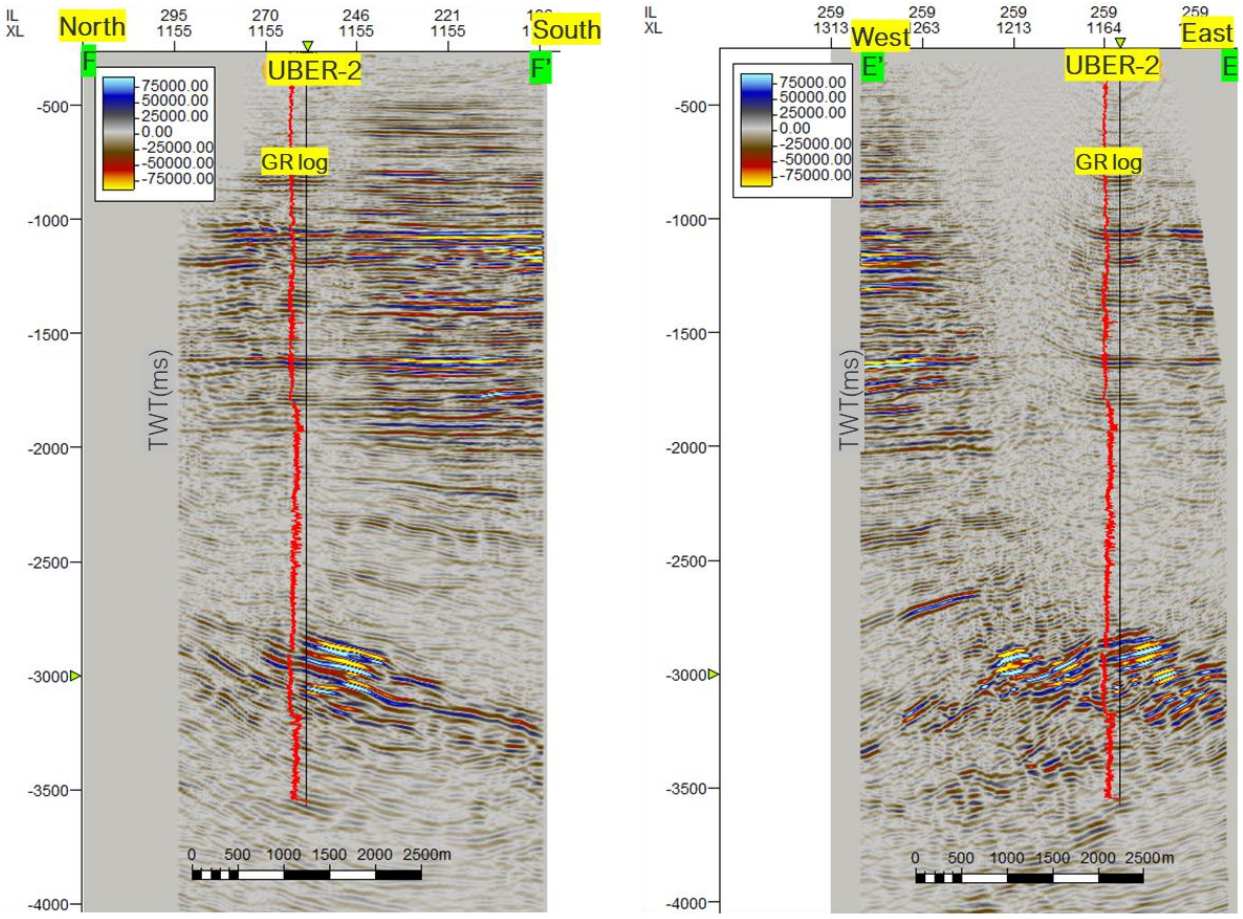
Fig.7 Well to Seismic Tie U-2

Major Faults have been interpreted. Structural modeling is done and Time structure maps at Hazad top, GS-6B Top, Y-marker & Olpad top are prepared to understand the structural framework at these levels

Refer pictures below:

Seismic sections along the well: **Figure 4-35**
Depth structure map at Hazad, Y-marker and Olpad Tops**: Figure 4-36**
Depth structure map at Hazad, Y-marker: **Figure 4-37.**
Structure contour on top of GS6 (Hazad): **Figure 4-38**
Effective sand thickness and gas isopay map on top of GS6 (Hazad): **Figure 4-39**

Figure 4-35:Seismic sections along the well



Vertical exaggeration: 2.5x
Seismic volume: 00003.CB-ONN-2004_3_3D-G498_FINAL_PSTM_STACK_

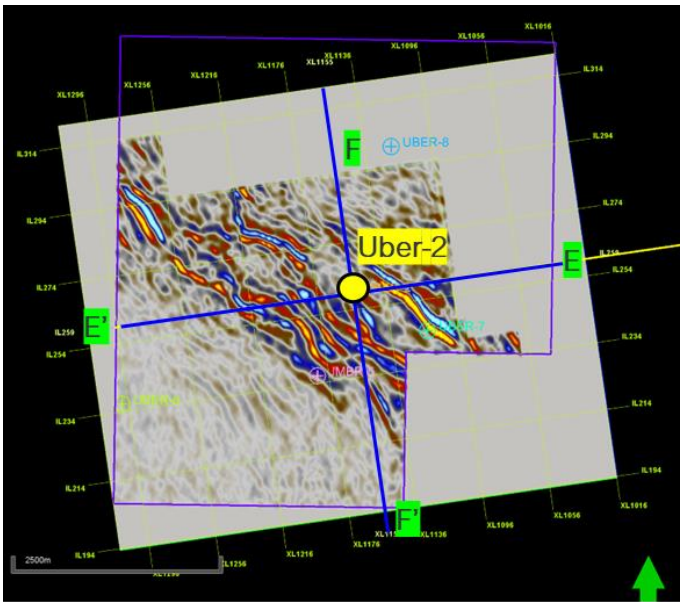


Figure 4-36: Depth structure map at Hazad, Y-marker and Olpad Tops

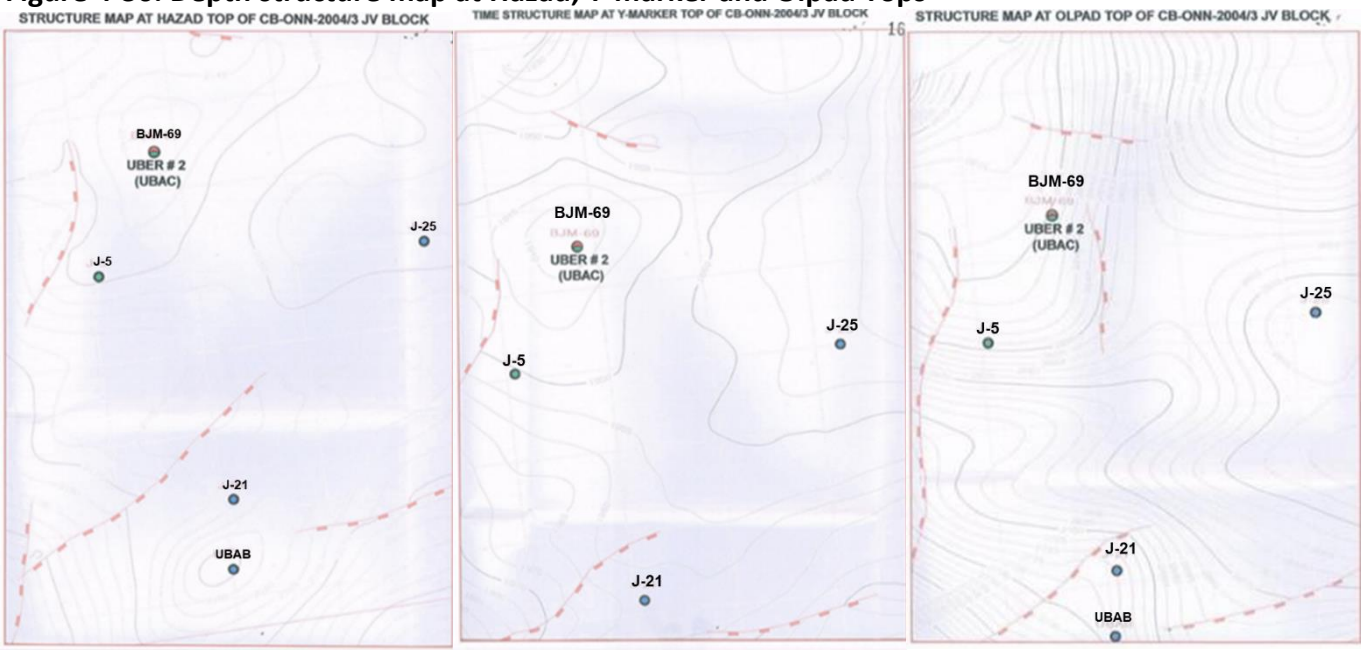


Figure 4-37: Depth structure map at Hazad and Y-marker Tops

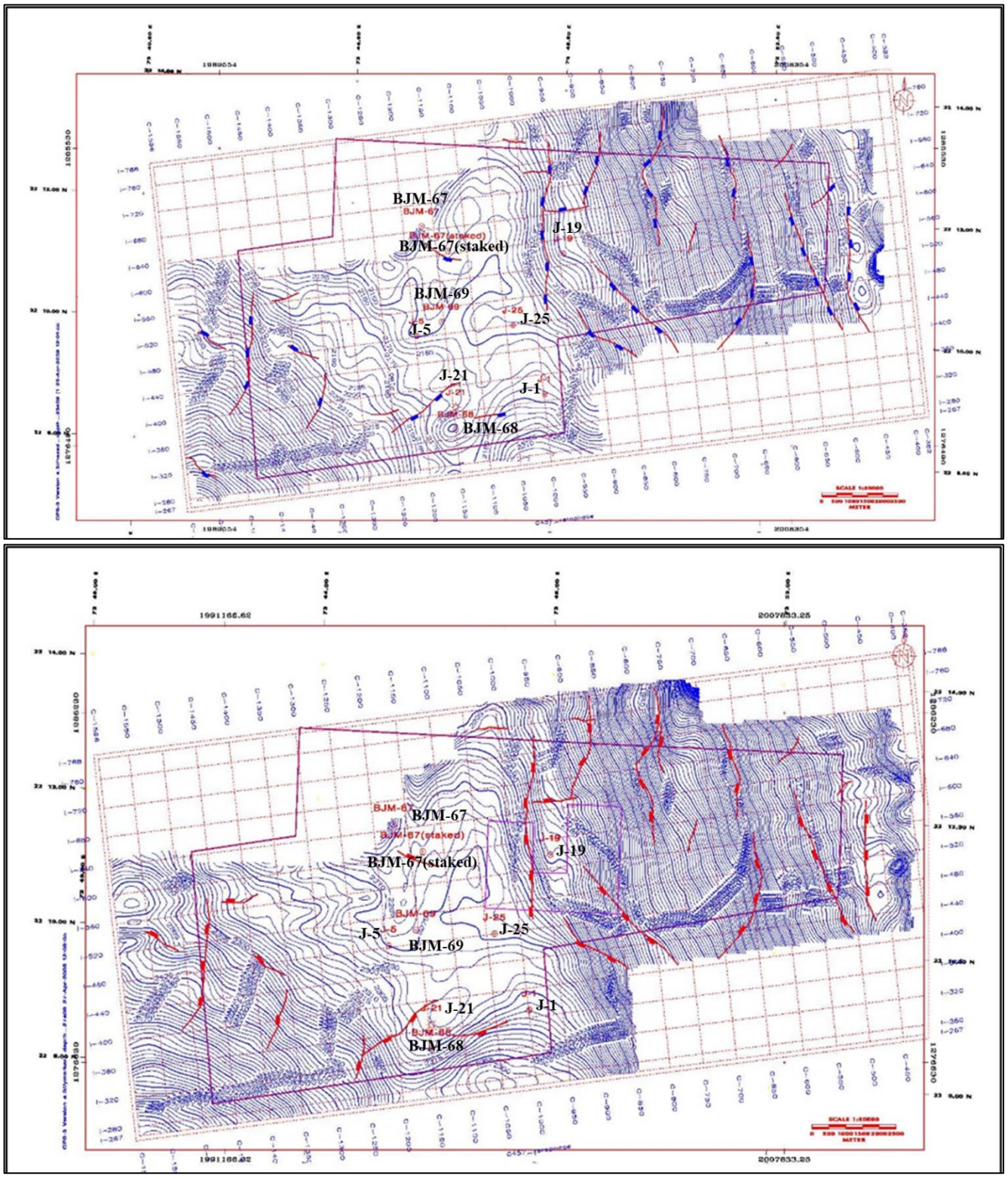


Figure 4-38: Structure contour on top of GS6 (Hazad)

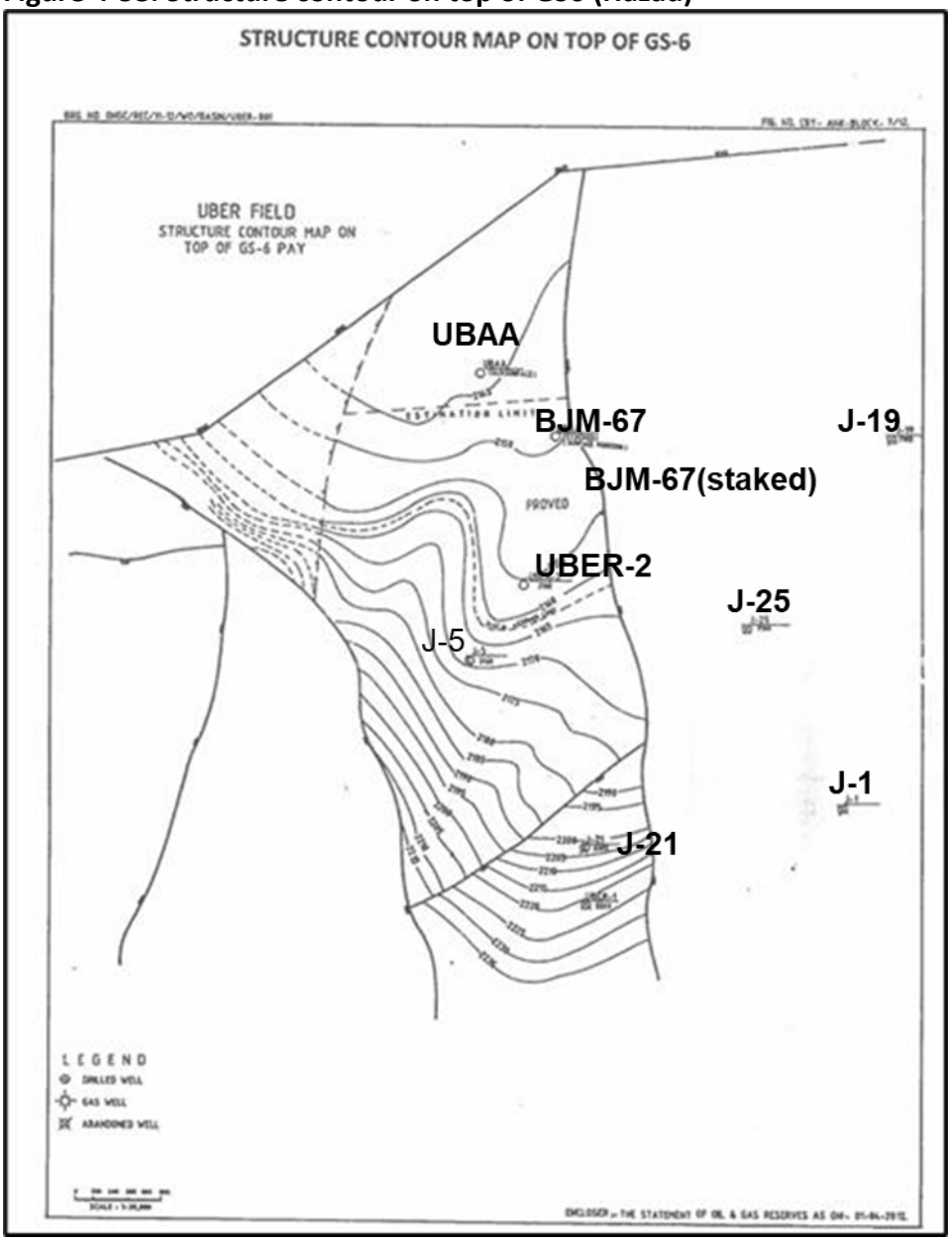
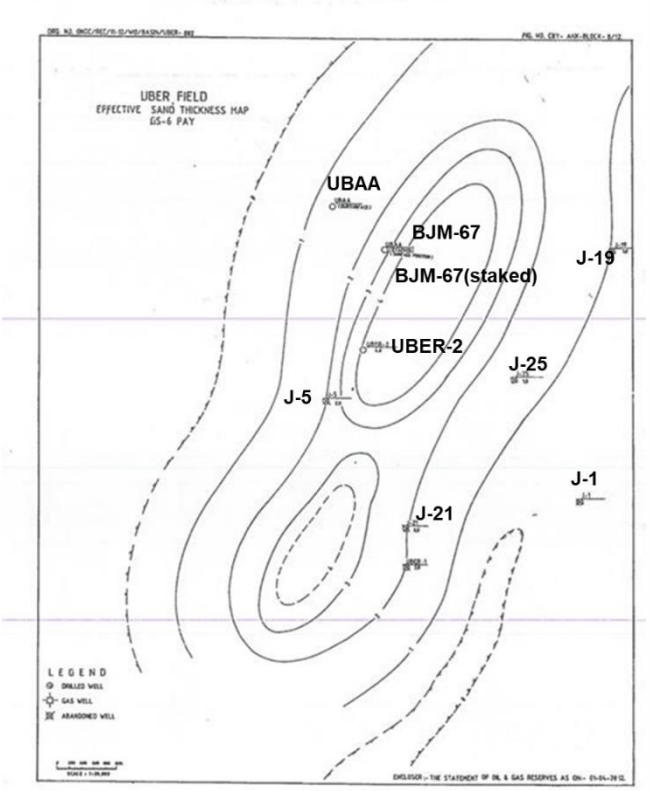
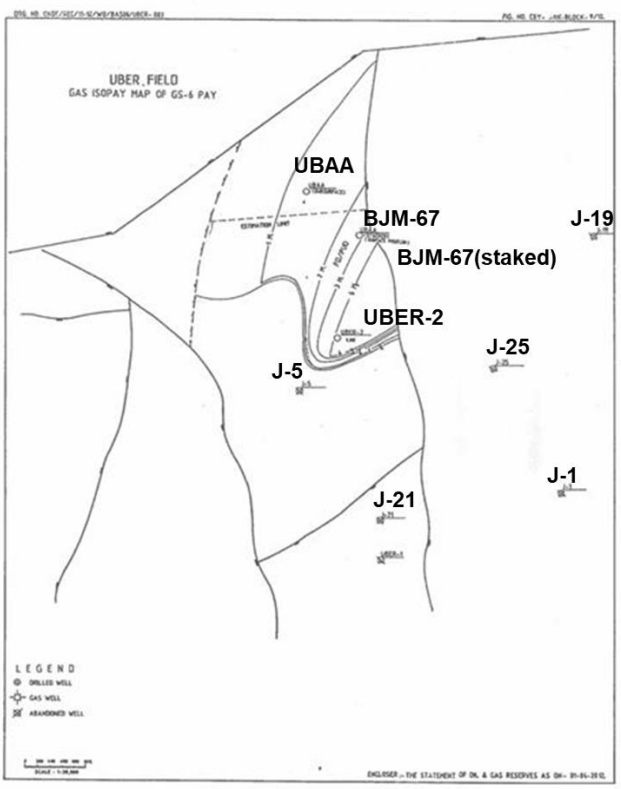


Figure 4-39: Effective sand thickness and gas isopay map on top of GS6 (Hazad)

EFFECTIVE SAND THICKNESS MAP ON TOP OF GS-6



GAS ISOPAY MAP OF GS-6 PAY



4.5.6 Reservoir parameters and hydrocarbon estimates (UBER-2) field:

The estimates of hydrocarbon in-place have been worked out under various field assumptions, and all inputs, working and results, as available and sourced, are presented in the following section

Table 4-51: Petrophysical parameters UBER-2

(Cut-offs used: $V_{cl} \leq 60\%$, $\Phi_e \geq 05\%$ and $S_w \leq 70\%$)

Sl. No.	Zone	Interval (m)	Effective Thickness (m)		Φ_e (%)	V_{sh} (%)	Shc (%)	Sw
			Inclined	Vertical				
1	Hazad Member (GS-6)	2160-2164	-	0	-	-	-	
2		2173-2179	-	4.01	14-22	23	42	58
3	Y-Marker	2268-2281	-	0	-	-	-	

Table 4-52: Parameters for Volumetric estimation of UBER-2 discovery area

Reservoir	Hazad Member (2173-2179)
Area, sqKm	6.157
Net Thickness, m	2.07
Average effective porosity	14%
Average hydrocarbon saturation	42%
FVF, rm3/sm3	0.00559
Z	0.875
Pressure, Ksc, & Temp	222.97 Ksc, 126.8 DegC
Dew Point	205.1 Ksc
CGR, m3/MMm3	750

Table 4-53: Volumetric estimation (2P) of UBER-2 discovery area

Category	O+OEG, MMTOE
Discovered	**0.22**

Erstwhile Operator-reported estimates on record:

The field has a reported hydrocarbon estimate (O+OEG) of **0.20 MMTOE**.

All these hydrocarbon estimates are subject to future assessments based on Operator's own technical insights and additional information/data, which may warrant possible revision of the currently reported estimates.

4.5.7 Production Facility for Oil and Gas Evacuation:

The nearest surface facility is JAMBUSAR GGS 15km

4.6 STATUS OF ADDITIONAL WELLS IN CB/ONDSF/CAMBAY ONLAND/2025 CONTRACT AREA

The contract area is a single area with 4 discoveries/fields (OGNAJ-1, PASUNIA-1, PASUNIA-2 and UBER-2) and 11 additional wells. The status of the additional well(s) has been described field-wise in the following section. Where reports/information were not available/accessible at the time of writing this report, the same may be enquired with NDR later.

PASUNIA 1&2:	
BKRL-3:	The exploratory well Bakrol-3 which is the 3rd well drilled on the Bakrol structure is located at 1.9 Km. in the direction of 520°W of Baketa Baora village and at 6.1 Km. in the direction of 535°E from Bakrol-2. The well is located on the highest (1475 m) closed structural contour. It was spudded on 15th March 1968 and completed on 4th May 1968 with a total drilled depth: 1507 m. The original target depth of 3000 m was reduced to 1507 m, as lower producing horizons met with in the southern (Navagam). structures were not found extending to this area as indicated by the drilling in Bakrol-2. The lithology of this well can be broadly correlated with the one found in the surrounding Ahmedabad, Kalol and Wavel areas. Kalol, Ahmedabad, Navagam structures which are situated in North, West and south of Bakrol structure respectively have produced hydrocarbons in the equivalent horizons of the upper Eocene formations. Equivalents of Kalol III and IV horizons consisting of silts and coal appear to shale out. Equivalent of Kalol VIII, IX horizon and X horizons comprising coal and silt, are well developed in this well. The earlier wells, Bakrol-1 & 2 which were drilled on the same structure proved the presence of hydrocarbons in the IX & Xth horizons. D.S.T. and production tests, in the IX and X horizons proved the presence of oil in them. Horizon XI is not developed in this well. Various production methods carried out at Bakrol-3, indicate that the interval perforated in the IX and X horizons are capable of producing crude oil with influx of 1.35 cubic meters per day by artificial lift. **Testing of horizons IX and X was incomplete and requires further testing.**
BKRL-7	This exploratory location was proposed as exploratory well in 'B' category for horizon IIIA with a projected depth of 1350 m.on a subtle trap to be drilled to probe horizon IIIA north-east of Bakrol structure. The location was also to explore the other horizons of Kalol Formations, particularly horizon IX & X which are oil bearing in Bakrol well No. 2. The well was spudded on 4.5.1977 and drilling completed on 1.6.1977 with total depth of 1485m. It was deepened to 1485 m as the horizons expected in the well were much down as planned earlier. After lowering production casing (5½") up to 1483.65m, two objects: (1446–1441.5 & 1436–1430.5m) and (1378–1373 & 1395–1401 m) were tested conventionally. Even after repeated application of compressor & aeration, no activity was observed.

	The testing of the above-mentioned objects was conducted, and the rig was released on 16.6.77. **Detailed testing is required with a workover rig.**
DEMALIYA#1	The wild cat exploratory well DEMALIYA#1 was drilled in the block located in the Ahmedabad-Mehsana tectonic block (Block–I) of the Cambay sedimentary basin. It covers an area of 42 Sq. km comprising of two parts: Part A, Area: 14 sq.km & Part B, Area: 28 sq.km. The objective of this well was to explore the hydrocarbon potential of the Kalol and Chhatral formation. The Well DEMALIYA#1 was spudded on 5th December 2016 No Mud loss has been observed in this well: Demaliya-1. **No influx** was observed in this well.
GMIJ-68	The exploratory location GMIJ-68 was released in the name of GMBP, with an objective to explore hydrocarbon potential of Chhatral unit south of well GMIJ-9. The well GMIJ-9 is an oil producer from Chhatral pay zone in the interval 1225-1220m, 1214-1208m. The location GMIJ-68 was targeted to 1450m. The well was spudded on 12.10.05 and was drilled as a vertical well to a depth of 1451 m. 9 5/8" and 5 ½" casing were lowered keeping shoe at 299m and 1435m. respectively. During drilling, cutting samples were collected from 700m onwards at every 5m interval. Based on analysis of cutting samples, electrolog analysis and their correlation with nearby well data two objects were decided for conventional testing in this well. Both the objects were tested conventionally and found to be dry. Object-I,in the interval1342- 1336 m,1332-1330 m, 1318-1315 m, 1306-1303m & 1296.5-1293.5m (Chhatral), was tested and proved to be dry (No influx). Object-II in the interval 1158.5 – 1156.5m (K- VI)), was tested and proved to be water bearing. **Absence of hydrocarbon in this GMIJ-68** has proved the facies are deteriorated in this area, which is also structurally lower.
OGNAJ-1	
OGNAJ-2	The Well Ognaj - 2 (OGAA) was spudded on 27-2-1985. At drilled depth of 1380.01 m (Logger's depth 1383m.correlation logs were recorded. A core XC-1 was out in the interval K ± m to 1479.4 m (equivalent of Kalol Pay zone IX + X) and drilled down to 1486.41 m. At this depth DST logs (SP, N, 2M, Caliper) were recorded. The loggers' depth was 1487 m. DST was cancelled due to the lack of suitable packer seat. No layer was recommended for testing in the well as reservoir parameters are poor. The well was **concluded to be a dry well and casing was not lowered.** Status is Abandoned well with cement plug of 100m in 350-250 interval.
OGNAJ-3:	The OGNAJ–3 (Ogj-3) has been drilled as a Development well for exploitation of hydrocarbon from Pay Zone Kalol – X and to reassess the potential of Kalol – IX in Ognaj Block. The well OGNAJ–3 was spudded in on 09.06.2011 and drilled up to 1700 m MD (1528.43 m TVD) on 28.06.2011 where all the main objectives of the well were achieved and hence further drilling was terminated before reaching the projected depth of 1725 m MD. In the 8 1/2" hole section full suite of logs was acquired. The boundaries of different formations were identified particularly from GR, SP, Rt., MSFL, Sonic and Density Logs along with Master logs. The

	Petrophysical interpretation of logs indicates that Kalol-VIII is developed in the interval 1588-1605m MD, is water bearing. KalolIX is developed in the interval 1606-1629 m MD, and only 2m (1624-1626m MD) showing marginal interest from HC point of view and interval 1626.5-1628.5 m MD may be water bearing. Two offset source VSPs were acquired @ the "deviated well" OGNAJ-3 between the 7th and 8th of November 2011. The channel/seismic facies variation was observed within K-IX & X pays between wells Ognaj-1 & Ognaj-3(East to west direction). Well, Ognaj-1 is falling within this channel where as well Ognaj-3 falls on the edge of the channel. Based on VSP results after integration of existing seismic data, the channel for future drilling prospects expecting presence of good reservoir facies was identified. During Initial Testing perforated 1638.3-639.8 m at Kalol-X level on 10.11.2011. On 15.11.2011, isolated K – X interval by setting Bridge plug at 1635 m. Fluid level prior to perforation was recorded and perforated interval 1616.00 – 1620.00 and 1626.50 – 1628.20 m in K –IX on 17.11.2011. **SRP was installed and the well was put on production** after making Concrete foundation on 29.11.2011.@3 SPM at 12:30 hrs.. On 01.12.2011 Oil production by Operating SRP@10:30 Hrs. 2.95 m3 Cumulative oil production from well w.e.f. 30.11.2011 to 07.12.2011 = 11.07 m3
SANAND-EAST-9:	The **SE#9 (Sanand East)** well was planned to encounter prospective reservoir targets primarily at the Cambay shale level and Olpad level, drilled down to 2200m (actual drilled depth 2101m). Well SE#9 was spudded on 3rd April 2009. SE#9 was proposed to probe a faulted anticlinal structural closure. The hydrocarbon potential was expected to be at a depth of 1560m within the Cambay shale Formation and at 2090m within Olpad Formation. High amplitude events of the Cambay shale and Olpad indicated the presence of possible hydrocarbon. Formation evaluation and conventional Mud logging, On-line real-time data monitoring and recording of pressure and drilling parameters were carried out. Sanand East-1 recorded hydrocarbon shows in the Kalol Formation. The Sanand and Jhalora Fields (adjacent to the Sanand Block) produce from multiple thin sand units in the Kalol, which have an average of 21% porosity and 100 mD permeability.
UBER-2	
UBER-6: (UBAG)	The exploratory location BJM-74 was released as UBAG under „B" category with a target depth of 2950m.The objective of the well was to explore Dadhar and Hazad sands.The well was drilled down to a depth of 2987m (Revised T.D.) and terminated within Cambay Shale. One conventional core (CC#1) was cut in this well in the interval 2204m-2209m. The recovery was 97.8% with gross lithology Shale. No SWCs or MDT samples could be taken due to well complications. During drilling hydrocarbon shows were observed at different depths in the form of GYF & pale yellow cut in the cutting interval 2040-2050m and NF & mildpale-yelloww cut in cuttings interval 2060-2065m, 2230-2250m, 2265-2270m & 2245-2250m. Also, maximum percentages of gas were detected by MLU gas sensors from 2710m onwards and continued upto TD.

	The well has penetrated through 1785.75m in Post Dadhar, 131m in Dadhar Formation, 12m in Telwa, 262m in Ardol, 8m in Kanwa, 111m in Hazad and 670m in Cambay Shale with 17.5m of "Y" marker. Based on log correlation with nearby wells, Uber#6 (UBAG) is structurally down w.r.t. Uber#2 at all formation level. The well is structurally up w.r.t. Jambusar#5 at Telwa (by 1m) and Ardol (by 16m) formation level and is structurally down at all other formation levels. Five objects were identified and out of which four were tested conventionally. Object-IV was skipped due to low resistivity as compared to the equivalent sand of discovery well UBER#2. Object-I (2945-2942m & 2940-2937m) in Cambay Shale Formation gave influx of water of maximum salinity 29.54 gpl Object-II (2762-2759m & 2756-2751m) in Cambay Shale Formation gave influx of oil with feeble gas during initial testing and was subsequently marked for HF job. Object-III (2343-2338.50m) in „Y" Marker gave poor influx of water with traces of oil. Object-V (a) (2062-2058m) in Ardol sand produced water of maximum salinity 4.62 gpl. Object-V(c) (2033-2025m) in Ardol sand produced water of maximum salinity 5.62 gpl The Hazad sand "GS-6" which is gas and condensate bearing in the discovery well UBER#2, is developed in the present well with a thickness of 3.50mThe GS-6 sand indicated GYF and pale-yellow cut in cutting samples. The GS-6 sand in the present well is not very promising as resistivity value is only ~ 2 ohm-m as compared to 20 ohm-m in the discovery well UBER#2. The oil bearing Y-marker in Jambusar#5 is well developed in the present well. Object-II (2762-2759 & 2756-2751m) was hydro fractured on 08.06.2013 by pumping X-linked gel along with high strength proppent. Rigless testing/ activation job was carried out from 14.06.2013 to 16.09.2013 against The cumulative oil collected during post HF activation was approximately 65m3 & cumulative liquid knocked out was approximately 146m3prior to GLVs installation. The well got activated with Air compressor and water only. Further activation of Object-II (2762m – 2759m & 2756m – 2751m) was concluded with well status as **Abandoned with Oil Indication**.
UBER-7	UBER#7 was drilled down to the target depth of 3074 m. Hydrocarbon shows were observed in cutting samples in the interval 2330m - 2335m. Electro-log correlation with nearby wells indicates that the present well is structurally down at all stratigraphic levels w.r.t UBER#6, Jambusar#5, UBER#2 and Jambusar#25.From the analysis of cutting sample details, MLU records, SWC data and interpretation of electro-logs recorded in this well, it was observed that objective sand GS-6 was well developed in and around the well bore area, but resistivity was much less with respect to that in nearby well UBER#2 (UBAC). Other sands of Hazad Member were not

	developed in this well. On testing (both complete sand and selective part), the main objective sand GS-6 produced water on self. Y-marker was well developed in this location, as it is in other nearby wells. This zone was also tested in this well and it gave poor influx of oil with water. G&G information available from the current well and nearby wells suggest that objective sand GS-6 was well developed in and around the well-bore area, though devoid of HC. **It seems that in GS-6 level, the current well UBER#7 (UBAI) falls below GWC. However, this well has helped to delineate the downward boundary of GS-6 pool encountered in up-dip well UBER#2 (UBAC).**
UBER-8 (UBAA)	The exploratory location BJM-67 was released as UBAA under 'B' category well with a revised target depth of 2900m (TVD) to explore Hazad sands and top part of Cambay Shale. The well was drilled down directionally to a depth of 3427m (MD) / 2900m (TVD) and terminated within Olpad formation. No conventional core was cut in this well. MDT samples were not taken due to well complications. During drilling no hydrocarbon show were observed, whereas gas were detected by MLU gas sensors at 3015m, 3092m,3174m,3197m, and 3242m. The well has penetrated through 1742.78m in Post Dadhar, 148.5m in Dadhar Formation, 8m in Telwa, 193m in Ardol, 9m in Kanwa, 96m in Hazad and 462m in Cambay Shale and 232m in Olpad formation. Based on electrolog correlation with nearby wells the present well is structurally shallower at all formation top as well as pay sand top level w.r.t UBER #2, UBER #7 & UBER #6. Four objects were identified, approved and tested conventionally. **Object-I (3248 - 3243m) in Olpad Formation** on activation, **gave poor/ no influx**. It was isolated by cement plug. **Object-II (3224-3220.5m) in Olpad Formation**, on activation gave **no influx**. It was isolated by bridge plug. **Object-III (3046-3043m) in Cambay shale**, on activation gave **no influx**. It was isolated by bridge plug. **Object-IV (2514.5-2513m) in Hazad sand (GS-6),** on activation, surfaced out 100 ltrs of Oil. On re-perforation and after acid job, water contributes from lower part, water shut off and selective perforation gave poor/ no influx. Object-IV was **concluded as an oil indication with poor influx.** The main objective sand in this well (GS-6), which is lying at a shallower level than that of nearby hydrocarbon bearing well in this same pay zone, is well developed in this well. The pay zone was tested conventionally and concluded with status: oil indication with poor influx. From this testing result it is inferred that, there are two different pools of GS-6 sand (One pool is of UBER#2 which has produced condensate and gas at a higher rate with comparatively deeper level than that of UBER#8 and other is the pool of UBER#8, where oil indication was present with poor influx even at a higher level than that of UBER#2).
JMBR-5:	Jambusar well No. 5 is a second well drilled in the area, immediately to the south of Mahisagar River. Subsurface information was available from the

	wells drilled in the adjoining Cambay region in the North; Jambusar well No. 1 & Padra Wells in the East and Broach & Anklesvar wells in the South. Jambusar well No. 1, which was drilled on structural terrace, gave clear oil shows during drilling in Eocene sediments though production of oil could not be established during testing, owing to poor permeability of the reservoir rock. Hence Jambusar well No. 5 was located on the structural terrace, at a point which is structurally higher than Jambusar Well No. 1, to find out the potentiality of the region. The well was electrologged at 1205 m depth by taking all conventional logs. After conditioning the hole, landed in 9 5/8" isolation casing down to 1200 m & cemented on 10.6.67 with 90 tons of A.C.C. oil well cement upto surface. While waiting on cement to set, B.O.P. was installed. Then there was a major shut down due to the low stock position of barites, up to 25.6.1967. Resumed drilling with 8½" bit & drilled down to 2701 m depth on 7.7.67 at 04.00 hrs. In this interval from 1200 m to 2701 m the following operations were carried out: Production testing at Jambusar-5 – **Feeble gas with oil** **Object-1 (2293.5 to 2287.0 m)** After unsuccessful attempts to flow the well by swabbing and using compressor up to 80 atmospheres, hydrosand perforation was carried out in object-1, against the intervals 2290.18 m and 2289.0 m. The well did not become active. The injectivity test carried out on 2-3-68 at 350 Kg/cm² of wellhead pressure showed that the formation was not taking the fluid, which raised doubts that the perforated intervals were choked up by mud and hence the well was washed on 11-3-68. It was decided to repeat injectivity/hydrofracturing with pressures greater than 350 Kg/cm². To protect the wellhead, tubings were run into 2285.0 m with the packer on 19-3-68. The well was washed again on 20-3-68. On opening the well on 21-3-68, gas flowed for about 5 minutes, and 20 litres of oil had accumulated above the water column. On washing the well during the next day traces of oil were observed. Attempts made to set the packer were unsuccessful. In summary, it may be stated that the well was tested before and after hydro-perforation, for injectivity/hydro-fracturing at pressures of 350 atmospheres (tubing head pressure) with fracturing units. **The formation had zero injectivity and did not yield by fracturing at that pressure.**

5. DATA PACKAGE INFORMATION

This information docket for the contract area, titled, CB/ONDSF/CAMBAY ONLAND/2025 is available with Data Package, which includes seismic data, well data and well completion and other reports. Apart from seismic and well data, the contract area has 41 reports. Given below is the detail of datasets that are available in the Data Package.

5.1 Well, Seismic Data and Reports Availability

5.1.1 Well Data: Cambay

Table 5-1: Latitude, Longitude and CRS data of Cambay Contract Area wells

Well name	Latitude (DD)	Longitude (DD)	CRS
PASUNIA-1	23.0490139	72.8026972	WGS84 UTM 43N
PASUNIA-2	23.0174806	72.8075028	WGS84 UTM 43N
OGNJ-1	23.0855417	72.5081056	WGS84 UTM 43N
OGNJ-2	23.0741473	72.5170446	WGS84 UTM 43N
OGNJ-3	23.0855611	72.5079778	WGS84 UTM 43N
SANAND-EAST-9	23.0703333	72.4605278	WGS84 UTM 43N
BKRL-7	23.0347871	72.7924423	WGS84 UTM 43N
BKRL-3	23.0322935	72.7694338	WGS84 UTM 43N
DEMALIYA-1	23.0168528	72.8164444	WGS84 UTM 43N
GMIJ-68	23.0376009	72.8327679	WGS84 UTM 43N
UBER-2	22.1729996	72.7604789	WGS84 UTM 43N
UBER-6	22.160645	72.7341314	WGS84 UTM 43N
UBER-7	22.1689778	72.7690917	WGS84 UTM 43N
UBER-8	22.1886042	72.7646119	WGS84 UTM 43N
JMBR-5	22.1639834	72.7565292	WGS84 UTM 43N

5.1.2 Seismic 2D data:

Figure 5-1: CAMBAY ONSHORE fields: CB/ONDSF/CAMBAY ONLAND/2025 contract area

DSF-IV CONTRACT AREA	Line segment name	Processing type	FSP/CDP	LSP/CDP	Length (Km)	CRS
CB/ONDSF/CAMBAY ONLAND/2025	G417-23	FINAL_MIGRATION	87	598	3.8477	WGS84 UTM 43N
	G417-22	FINAL_MIGRATION	144	777	3.1402	WGS84 UTM 43N
	G417-14	FINAL_MIGRATION	116	917	4.1203	WGS84 UTM 43N
	G417-06	FINAL_MIGRATION	101	897	4.0998	WGS84 UTM 43N
	G417-04	FINAL_MIGRATION	51	841	1.9812	WGS84 UTM 43N
	G417-03	FINAL_MIGRATION	115	948	4.1254	WGS84 UTM 43N
	G270-19	FINAL_STACK	105	1444	6.6975	WGS84 UTM 43N
	G270-18	FINAL_STACK	105	1490	9.0884	WGS84 UTM 43N
	G270-17	FINAL_STACK	105	1362	8.9501	WGS84 UTM 43N
	G270-16	FINAL_STACK	105	1416	6.6358	WGS84 UTM 43N
	G270-15	FINAL_STACK	105	1434	2.7119	WGS84 UTM 43N
	G270-15	FINAL_STACK	105	1434	0.7052	WGS84 UTM 43N
	G270-11	FINAL_STACK	105	1215	3.7083	WGS84 UTM 43N
	G270-9	FINAL_STACK	105	1239	5.3697	WGS84 UTM 43N
	G270-2	FINAL_STACK	105	1290	5.5097	WGS84 UTM 43N
	G292-06	FINAL_MIGRATION	2	1518	6.0578	WGS84 UTM 43N
	G276-15	REPROCESSED_FINAL_PSTM_STACK	70	638	1.5431	WGS84 UTM 43N
	G276-12	REPROCESSED_FINAL_PSTM_STACK	71	288	2.1467	WGS84 UTM 43N
	G276-10	REPROCESSED_FINAL_PSTM_STACK	72	686	4.9092	WGS84 UTM 43N
	G276-8	REPROCESSED_FINAL_PSTM_STACK	65	445	5.2749	WGS84 UTM 43N
	G276-6	REPROCESSED_FINAL_PSTM_STACK	105	260	3.08	WGS84 UTM 43N
	G276-3	REPROCESSED_FINAL_PSTM_STACK	71	470	2.5455	WGS84 UTM 43N
	G276-1	REPROCESSED_FINAL_PSTM_STACK	105	458	4.4417	WGS84 UTM 43N
	G276-2	FINAL_MIGRATION	67	469	5.9742	WGS84 UTM 43N
	G276-15	FINAL_MIGRATION	69	638	3.2899	WGS84 UTM 43N
	G428-102	FINAL_PSTM_STACK	65	1470	3.973	WGS84 UTM 43N
	G428-101	FINAL_PSTM_STACK	63	1434	4.0038	WGS84 UTM 43N
	G309-9	FINAL_MIGRATION	129	1597	5.118	WGS84 UTM 43N
	G309-6	FINAL_MIGRATION	69	1407	2.5407	WGS84 UTM 43N
	G309-6	FINAL_MIGRATION	69	1407	1.1262	WGS84 UTM 43N
	G309-2	FINAL_MIGRATION	91	1314	5.4672	WGS84 UTM 43N
	G256-4	FINAL_STACK	50	998	1.3648	WGS84 UTM 43N
	G256-2	FINAL_STACK	50	990	5.0663	WGS84 UTM 43N
	G256-19	FINAL_STACK	54	1075	2.9617	WGS84 UTM 43N
	G256-17	FINAL_STACK	54	1055	2.3594	WGS84 UTM 43N
	G256-15	FINAL_STACK	54	1090	2.8736	WGS84 UTM 43N
	G284-RL-25C	FINAL_MIGRATION	2495	3000	6.2124	WGS84 UTM 43N
	1105	FINAL_MIGRATION	1	191	3.5057	WGS84 UTM 43N
	1097	FINAL_MIGRATION	1	429	1.6781	WGS84 UTM 43N
	1089	FINAL_MIGRATION	1	430	0.9725	WGS84 UTM 43N
	1089	FINAL_MIGRATION	1	430	1.9903	WGS84 UTM 43N
	1081	FINAL_MIGRATION	1	357	1.8849	WGS84 UTM 43N
	1081	FINAL_MIGRATION	1	357	1.9895	WGS84 UTM 43N
	1073	FINAL_MIGRATION	1	326	3.98	WGS84 UTM 43N
	1065	FINAL_MIGRATION	1	284	4.1535	WGS84 UTM 43N
	1057	FINAL_MIGRATION	1	257	4.7191	WGS84 UTM 43N
	1049	FINAL_MIGRATION	1	262	5.4921	WGS84 UTM 43N
	1033	FINAL_MIGRATION	1	214	4.2461	WGS84 UTM 43N
	1025	FINAL_MIGRATION	1	188	3.0737	WGS84 UTM 43N
	1017	FINAL_MIGRATION	1	191	3.5057	WGS84 UTM 43N
	332-16	REPROCESSED_FINAL_POSTM_STACK	103	1554	1.101	WGS84 UTM 43N
	332-16	REPROCESSED_FINAL_POSTM_STACK	103	1554	2.3031	WGS84 UTM 43N
	332-14	REPROCESSED_FINAL_POSTM_STACK	103	1504	5.6815	WGS84 UTM 43N
	276-42	REPROCESSED_FINAL_POSTM_STACK	67	542	1.1712	WGS84 UTM 43N

DSF-IV CONTRACT AREA	Line segment name	Processing type	FSP/CDP	LSP/CDP	Length (Km)	CRS
CB/ONDSF/CAMBAY ONLAND/2025	207-15	REPROCESSED_FINAL_POSTM_STACK	194	456	4.0865	WGS84 UTM 43N
	G332-23	REPROCESSED_FINAL_PSTM_STACK	3	1970	6.3995	WGS84 UTM 43N
	G332-21	REPROCESSED_FINAL_PSTM_STACK	1	1975	6.48	WGS84 UTM 43N
	G332-19	REPROCESSED_FINAL_PSTM_STACK	1	1882	7.5437	WGS84 UTM 43N
	G332-17	REPROCESSED_FINAL_PSTM_STACK	1	1359	6.659	WGS84 UTM 43N
	G332-15	REPROCESSED_FINAL_PSTM_STACK	1	1364	3.7444	WGS84 UTM 43N
	G332-13	REPROCESSED_FINAL_PSTM_STACK	1	2032	1.7965	WGS84 UTM 43N
	G332-12	REPROCESSED_FINAL_PSTM_STACK	1	1412	7.2501	WGS84 UTM 43N
	G332-10	REPROCESSED_FINAL_PSTM_STACK	1	1468	2.1391	WGS84 UTM 43N
	G334-14	REPROCESSED_FINAL_PSTM_STACK	2	1449	1.7001	WGS84 UTM 43N
	G334-12	REPROCESSED_FINAL_PSTM_STACK	2	1310	2.2488	WGS84 UTM 43N
	G334-3	REPROCESSED_FINAL_PSTM_STACK	2	1535	5.3244	WGS84 UTM 43N
	G297-00	REPROCESSED_FINAL_PSTM_STACK	1	4914	5.1558	WGS84 UTM 43N
	G207-20	FINAL_STACK	38	360	2.8763	WGS84 UTM 43N
	G207-19	FINAL_STACK	38	361	3.2816	WGS84 UTM 43N
	G207-15	FINAL_STACK	41	530	3.8551	WGS84 UTM 43N
	G198-8	FINAL_STACK	28	1016	2.3492	WGS84 UTM 43N
	G198-7	FINAL_STACK	28	512	3.3983	WGS84 UTM 43N
	G198-6	FINAL_STACK	28	528	2.6831	WGS84 UTM 43N
	G198-5	FINAL_STACK	28	512	2.7575	WGS84 UTM 43N
	G198-16	FINAL_STACK	29	665	4.6927	WGS84 UTM 43N
	G219-2	REPROCESSED_FINAL_PSTM_STACK	739	1244	5.7689	WGS84 UTM 43N
	G219-1	REPROCESSED_FINAL_PSTM_STACK	689	1244	3.2624	WGS84 UTM 43N
	G219-1	REPROCESSED_FINAL_PSTM_STACK	689	1244	1.3833	WGS84 UTM 43N
	G311-22	PSTM	106	1517	1.2885	WGS84 UTM 43N
	G263-8	REPROCESSED_FINAL_PSTM_STACK	77	582	2.8403	WGS84 UTM 43N
	G263-17	REPROCESSED_FINAL_PSTM_STACK	75	610	1.7969	WGS84 UTM 43N
	G263-15	REPROCESSED_FINAL_PSTM_STACK	92	510	1.556	WGS84 UTM 43N
	G263-13	REPROCESSED_FINAL_PSTM_STACK	122	510	2.599	WGS84 UTM 43N
	G477A-34	FINAL_PSTM_STACK	1	1264	4.1203	WGS84 UTM 43N
	G477A-29	FINAL_PSTM_STACK	1	1913	5.7115	WGS84 UTM 43N
	G477A-28	FINAL_PSTM_STACK	1	1993	5.8073	WGS84 UTM 43N
	G477A-27	FINAL_PSTM_STACK	1	1638	5.8078	WGS84 UTM 43N
	G477A-26	FINAL_PSTM_STACK	1	1795	1.6979	WGS84 UTM 43N
	G477A-26	FINAL_PSTM_STACK	1	1795	3.7788	WGS84 UTM 43N
	G477A-17	FINAL_PSTM_STACK	1	1079	2.1984	WGS84 UTM 43N
	G477A-16	FINAL_PSTM_STACK	1	1037	3.3877	WGS84 UTM 43N
	G477A-15	FINAL_PSTM_STACK	1	987	3.4777	WGS84 UTM 43N
	G477A-14	FINAL_PSTM_STACK	1	1034	3.6767	WGS84 UTM 43N
	G477-25	FINAL_PSTM_STACK	1	3036	0.7491	WGS84 UTM 43N
	G477-25	FINAL_PSTM_STACK	1	3036	2.8302	WGS84 UTM 43N
	G477-24	FINAL_PSTM_STACK	1	3051	1.5003	WGS84 UTM 43N
					356.13	

5.1.3 Seismic 3D Data:

Figure 5-2: CAMBAY ONSHORE fields: CB/ONDSF/CAMBAY ONLAND/2025 contract area

00001.CB-ONN-2002_3_3D_SANAND_FINAL_MIGRATION_.sgy
3D bin centre corner points - all traces

3D bin centre corner points - all traces : 00001.CB-ONN-2002_3_3D_SANAND_FINAL_MIGRATION_.sgy

Point	Inline	Crossline	Easting	Northing
1	190	1152	238747.00	2553084.00
2	376	1152	238747.00	2558664.00
3	376	1607	245572.00	2558664.00
4	190	1607	245572.00	2553084.00

00002.CB-ONN-2010_8_3D_PSTM_FINAL_PSTM_STACK_.sgy
3D bin centre corner points - all traces

3D bin centre corner points - all traces : 00002.CB-ONN-2010_8_3D_PSTM_FINAL_PSTM_STACK_.sgy

Point	Inline	Crossline	Easting	Northing
1	389	89	271528.00	2545165.00
2	850	89	271528.00	2552080.00
3	850	541	278308.00	2552080.00
4	389	541	278308.00	2545165.00

00003.CB-ONN-2004_3_3D-G498_FINAL_PSTM_STACK_.sgy
3D bin centre corner points - all traces

3D bin centre corner points - all traces : 00003.CB-ONN-2004_3_3D-G498_FINAL_PSTM_STACK_.sgy

Point	Inline	Crossline	Easting	Northing
1	194	1016	272197.34	2451497.50
2	320	1016	271470.00	2456485.00
3	320	1313	265591.56	2455628.00
4	194	1313	266319.06	2450640.00

5.2 Data Package Cost

The Data Package contains seismic (2D and/or 3D) and well data along with reports. The cost of the Data Package of this Information Docket (CB/ONDSF/CAMBAY ONLAND/2025 contract area) comes to be USD 3,120. This cost is as per the current data policy of NDR at the time of writing this report and subject to changes if data rates or policy framework are revised.

COST OF DATA PACKAGE FOR DSF-IV BLOCKS								
S.No.	Contract Area on offer	AREA (SQ KM)	NIO Map reference no.	Total Wells	2D Seismic (LKM)	3D Seismic (SKM)	No. of Reports	FINAL COST in USD($)
1	CB/ONDSF/CAMBAY ONLAND/2025	110.48	O-2	15	356.13	85.39	41	**3120**

6. CONTRACT AREA SUMMARY

Contract area name: CB/ONDSF/CAMBAY ONLAND/2025

NIO map reference no.: **O-2**

Geographical area: **CAMBAY ONLAND**

Number of field(s)/discoveries: **4**

Number of well(s): **15 (**including discovery wells)

Total area: **110.48 Sq. Km**.

Seismic 2D data: **356.13 Line Km**.

Seismic 3D data: **85.39 Sq. Km**.

Report(s) available: **41**

Hydrocarbon In-Place (2P) O+OEG **: 0.93 MMTOE**

Data package cost: **USD 3,120**

7. CONCLUSIONS

The information docket has been prepared from the geoscientific and engineering data sets, made available by NOCs and Private/JV Operators along with earlier offered DSF acreage). The work has been primarily accomplished with all requisite data/information pre-processed using various in-house interpretation software. Desktop publishing applications of documents, spreadsheets and images including Google maps have also been extensively used.

The 4 discoveries, which are lying unpursued and holding contingent resources/ reserves are potential to be further developed/commercially produced. This booklet will be a useful supplement to the Data Package of the corresponding Contract Area. Such data represent 2D/3D seismic, well logs and reports on key information from various field operations pertaining to drilling, logging, testing and production. The total data package on offer under this bid round includes 356.13 LKM 2D seismic, 85.39 SKM 3D seismic, 15 well data. The Data Package will be hosted in Data rooms for viewing and for sale from National Data Repository (NDR) to the interested investors/ bidders.

Though, the docket mentions estimated hydrocarbon, it indicates extent and order of hydrocarbon pool size. DGH strongly recommends that bidders must have their own understanding and independent assessment of resource base to support any forward bidding decision.

पेट्रोलियम एवं
प्राकृतिक गैस मंत्रालय
MINISTRY OF
PETROLEUM AND NATURAL GAS

सत्यमेव जयते

DGH

DIRECTORATE GENERAL OF HYDROCARBONS

(Ministry of Petroleum & Natural Gas,Government of India)

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MINISTRY OF
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सत्यमेव जयते

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