

## STATUS REPORT

### IN THE MATTER OF O. A. 669 OF 2018, MARVADA AMRUTLAL BECHARLAL Vs. STATE OF GUJARAT – ASHAPURA GROUP OF COMPANIES, KUTCH

- Gujarat Pollution Control Board is abided to comply with the Hon'ble NGT directions and orders. In compliance to last order dated 20/11/2019 the periodical monitoring of unit to verify the progress of unit is being carried out and reported along with sampling and analysis reports.
- **Action taken in compliance to last Hon'ble NGT order dated 20/11/2019 is as below;**
  - As directed in the order, public notice was issued on 27/02/2020 and 28/02/2020 in vernacular language and English newspaper.
  - The progress of the unit was verified jointly by the officers of CPCB and GPCB on 31.12.2019, 06.02.2020 and 16.03.2020.
- The action taken report along with joint inspection report and progress report was mailed to Hon'ble NGT on 21/05/2020.
- **Status report with respect to gypsum disposal;**

Total number of sites where gypsum was disposed	39 (34 + 5*)
Total number of sites cleared	26 (21 + 5*)
Total number of sites not cleared	13

\*Note: 5 sites are sub sites of main sites, which are included in 21 sites and are cleared.

- **Breakup of 13 sites which are not cleared are as follows and status report of those sites attached here as an Annexure-I;**

Abandoned mines	04
Land reclamation site	05
Agricultural land having crops	01
Public infrastructure	03

- The unit was directed in revocation order dated 20.02.2020, to approach third party like NEERI, NPC etc. organization for the certification for the remediation.

- In this reference, the unit submitted the study reports by M/s. Gujarat Industrial and Technical Consultancy Organization Ltd. (GITCO), Ahmedabad, for sites from where gypsum waste is cleared and for sites where gypsum waste is still there.
- The certification through study report is submitted for the sites which are cleared by unit, and in the report it is concluded that;

*“Recapitulating all the gathered information and our soil analysis report it is concluded that Gypsum has been lifted from all the 21 sites and no detrimental effect is observed in soil quality of said 21 sites.”*

- GITCO’s report on gypsum site clearance is attached herewith as an **Annexure-II**.
- For the 13 sites where gypsum waste is there, as per report after sampling and analysis of gypsum, soil and ground water, it is concluded that;

*“Based on our study and analysis it is concluded that the Gypsum at these 13 sites is practically difficult to lift and is not having any adverse impacts on surrounding soil or ground water quality. As such Gypsum contains major secondary plant nutrient required for plant growth in soil viz. Calcium and Sulphur. However, these sites can be ameliorated by following measures:*

- 1. Local top soil cover of 6-8 inch can be laid over these sites and where possible suitable vegetation viz. neem, gulmahor can be planted.*
- 2. The unit shall monitor the ground water and soil quality at regular interval near the gypsum site and maintain analysis report and submit the same to the statutory authority.”*

- GITCO’s report on analysis & assessment of soil & groundwater quality in & around 13 gypsum sites is attached herewith as an **Annexure-III**.

➤ **Status of ground water remediation**

- The groundwater remediation as per the method suggested by Kadam Enviro Consultant, Vadodara i.e. Pump and Treat method was done. During COVID-19 pandemic situation the remediation process was stopped. Now the unit has started the groundwater remediation.
- The groundwater remediation activity is going on in affected three bore-wells.
- As per the analysis reports, the average reduction in ammonical nitrogen concentration in ground water is around 35-40%.

- Presently, the TDS concentration is higher at all the locations (2310 – 7010 mg/l) while earlier it was increased on one location and decreased on another location, it may be according to the hydrogeology of the region.
  - The unit has constructed 2 nos. of groundwater recharge structures & piezometer to monitor and maintain prevailing groundwater table in vicinity of unit. Also unit has proposed to install other 2 recharge structures and piezometer.
- The gypsum waste disposed during January-2019 to May-2020 is as below and details of gypsum disposal is attached here as an **Annexure-IV**;
- 89555.5 MT to cement industries for co-processing.
  - 37372 MT for the back filling to abandoned mines.
- **Conclusion**
- The unit has cleared 26 (i.e. 21+5) sites out of 39 sites and now 13 sites are not cleared.
- The unit has submitted 2 reports for sites which are cleared and which are not cleared. The copies of reports are enclosed for consideration.
- For sites cleared; the GITCO had taken samples of virgin soil and soil where earlier gypsum was dumped. As per the analysis report, it is concluded that there is no detrimental effect on soil at sites where gypsum has been cleared.
  - For remaining 13 sites; the GITCO had taken samples of gypsum, soil and groundwater from in and around of sites. As per report, it is concluded that looking to the site practically it is difficult to lift the gypsum and also it is stated that there is no any adverse impact on surrounding soil and on groundwater due to dumped gypsum.
  - The unit shall continue the remediation of bore wells.
  - The unit shall monitor the groundwater table and also explore the possibilities of new recharge wells at different locations.
- After duly considering inspection reports and study reports of GITCOs, the extension of revocation is under process.

Status Report of 13 Gypsum Locations				
Sr. No.	Location No.	Location/Area	As on 27/06/2020	Unit's submission
1.	1.	Behind Lehriya Hanuman Temple, Old stone mine, Kukma Village Geographical Coordinates 23° 13' 21" N, 69° 46' 21" E	The site is an abandoned stone mine. Gypsum was observed dumped in the mine.  Kukma, Survey No 331/1/P1 Lease /Government Land	Abandoned mines wherein Gypsum has been utilized for backfilling as per EC conditions. It is pertinent to note that as per EC condition <b>SEIAA/ GUJ/ EC/ 2(b)/ 497/2016</b> Gypsum could be utilized in backfilling of abandoned mines.
2.	4.	Old stone mine of Prakash Patel, Survey No:331, Besides old HotMix plant, Kukma Village 23° 13' 16" N 69° 46' 3" E	The site is low lying abandoned area (abandoned stone mine). Gypsum was observed dumped in the mine.  Kukma, Survey No 331/1/P1 Lease /Government Land	Abandoned mines wherein Gypsum has been utilized for backfilling as per EC conditions. It is pertinent to note that as per EC condition <b>SEIAA/ GUJ/ EC/ 2(b)/ 497/2016</b> Gypsum could be utilized in backfilling of abandoned mines.
3.	5.	Behind khatri mills (Besides site described at S. No. 4 above), Traverse survey no: 331, government land, Kukma Village 23° 13' 20" N 69° 45' 58" E	The site is an abandoned stone mine. Gypsum was observed dumped in the mine.  Kukma, Survey No 331/1/P1 Lease /Government Land	Abandoned mines wherein Gypsum has been utilized for backfilling as per EC conditions. It is pertinent to note that as per EC condition <b>SEIAA/ GUJ/ EC/ 2(b)/ 497/2016</b> Gypsum could be utilized in backfilling of abandoned mines.
4.	7.	Natural drain between farm of Dinesh Maharaj and Govind Vanker, survey no : 218, Kukma Village 23° 11' 56" N 69° 46' 47" E	The site is an agricultural land. Gypsum is mixed with soil on this agricultural land. Also some Gypsum is dumped on sides of the farm for making bund.  Kukma Survey No. 218 Shri Dinesh Bhailal Joshi Private Land	Gypsum is used here to provide support to embankment of farm slope which can reduce the chances of soil erosion. Majorly Gypsum is used as Soil conditioner in the farm where crops are grown already. Gypsum helps to retain the moisture which is very beneficial to crops along with providing some necessary nutrients. Removal of gypsum from farm and slope may cause damage to the farming land and lead to soil erosion from the slope of the farm.

5.	10.	Kukma- Lakhond village Road 23° 13' 50" N 69° 46' 48" E	The alleged site is along Kukma- Lakhond village Road. Gypsum is dumped along the low lying side of the road in about 1 KM stretch.  Kukma, Survey No 331/1/P1 Government Land	Gypsum is here used to provide structural support to the sewage pipeline. Removing gypsum may cause instability to surface and structure which can cause damage to sewage pipeline and can further as a consequence lead to domestic wastewater pollution.
6.	11.	Vrundavan Gir Gaudham, Shree Swaminarayan Mandir, Besides Ashapura Colony, Bhachau Road 23° 13' 49" N 69° 46' 48" E	The site is open barren land. Gypsum was observed spread in about 2000 M <sup>2</sup> flat land which is covered with silica sand.  Kukma, Survey No 331/1/P1 Gausala/ Government Land	Gypsum was used herein for land reclamation. Subsequently, a cowshed had been constructed on the levelled land. Thus, removing Gypsum from underneath the Cowshed would mean disturbing the structure of the Cowshed and destroying it permanently.
7.	14.	Land of Lakhond Village 23° 15' 12" N 69° 46' 41" E	The site is a barren land where Gypsum is dumped in low lying areas.  Lakhond Survey No. 70 Government Land	Gypsum was used once again to level land and as it added moisture to the soil, fodder crops were grown subsequently to help feed the cattle in and around this area. Gypsum has become an integral part of the existing land and removing it will cause soil erosion and also lead to damage of the fodder crops, grown specifically to feed cattle.
8.	15.	Adjacent to the site mentioned above at location no. (14). Land of Lakhond Village 23° 15' 11" N 69° 46' 40" E	The site is an abandoned land where Gypsum was found dumped in voids and corners.  Lakhond Survey No. 70 Government Land.	Gypsum was used once again to level land and as it added moisture to the soil, fodder crops were grown subsequently to help feed the cattle in and around this area. Gypsum has become an integral part of the existing land and removing it will cause soil erosion and also lead to damage of the fodder crops, grown specifically to feed cattle.
9.	17.	China Clay mine of Vastabhai, Village lakhond, Abandoned mine 23° 15' 39" N 69° 47' 17" E	The site is an abandoned china clay mine. Gypsum was observed dumped in the mine.  Lakhond Mine Lease	Abandoned mines wherein Gypsum has been utilized for backfilling as per EC conditions. It is pertinent to note that as per EC condition <b>SEIAA/ GUJ/ EC/ 2(b)/ 497/2016</b> Gypsum could be utilized in backfilling of abandoned mines.

10.	18.	Government land on Padhdhar village 23° 14' 29" N 69° 48' 44" E	The site is an abandoned location where Gypsum was found spread on top soil in about 1000 M <sup>2</sup> area.  Padhar Survey no 741/P Government Land	Gypsum was used again to level land and as it added moisture to the soil, plants and shrubs were grown, such as Babool plants etc. At present many Babool plants and other wild plants are growing which show that land is now suitable for the farming, which however, will be adversely affected after gypsum removal.
11.	26.	Pithoradada Mandir, Ler Village. 23° 10' 23" N 69° 46' 05" E	The site is outer boundary of Pithoradada Mandir. Gypsum is dumped on the side slope of temple boundary.  Vadva Survey No 151 Temple /Government Land	Gypsum is used to provide structural support on the hill side of temple as temple is situated on a hill. One entire side of the temple is supported by gypsum alone, thus removal of gypsum from there may cause substantial damage to the property. Gypsum is also used to level nearby area of temple on which See-Saw, Swing and Slide is constructed for recreational activities for kids. Removal of gypsum may turn the land uneven and as a consequence lead to structural damage.
12.	38.	Maldhari Mangal Mandir Chhatralay, Bhujodi 23° 13' 45" N 69° 44' 09" E	The site is open land of about 100 × 150 M <sup>2</sup> . Gypsum was found spread in this land area covered with white silica on top.  Bhujodi Survey No. 158 School (Waste land & Others)	Gypsum is used for leveling of land where a hostel has been constructed on one side while the whole area is being used as school playground and other sports facilities are also being developed over there such as Volley ball court etc.
13.	39.	Shri Vakal Mata Mandir, Village: Bhujodi 23° 13' 35" N 69° 44' 41" E	Gypsum was observed on this site. Most of the Gypsum was mixed with soil where new plantation was observed on some patches. Also Gypsum was observed stacked on sides of the land area.  Bhujodi Survey No. 158 Temple (Waste land & Others)	Gypsum is used as Soil conditioner near the temple area to grow various varieties of trees e.g. Gulmohar, Neem, conocarpus and to develop the green belt around the temple. Further, Gypsum is also giving structural support to the temple which, if removed, would lead to permanent damage to the Temple. Thus, removal of gypsum from this site may cause damage to plants and may leads to soil erosion.

**REPORT  
ON  
GYPSUM SITE CLEARANCE**



**ASHAPURA PERFOCLAY LTD.(APL)**  
**PLOT NO. 163, 164 & 167, VILLAGE: LER, TALUKA: BHUJ,**  
**DIST.: KUTCH, GUJRAT, INDIA**

**PREPARED BY**



**GUJARAT INDUSTRIAL AND TECHNICAL  
CONSULTANCY ORGANISATION LIMITED**  
**GITCO HOUSE, STADIUM ROAD, NAVRANGPURA**  
**AHMEDABAD - 380 009**

**JUNE 2020**

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## 1.0 INTRODUCTION

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### 1.1 PREAMBLE:

M/s. Ashapura Perfoclay Ltd. (APL) was established in the year 2001 and is located at Plot No. 163, 164 & 167 Village: Ler, Taluka: Bhuj, Dist.: Kutch in a state of Gujarat. APL is a part of Ashapura Group of Industry. The unit has been granted Consolidated Consent & Authorization (CC&A) by Gujarat Pollution Control Board, vide Order No: AWH 93521 dated 11-06-2018, which is valid up to 24-06-2023 for manufacturing of Bleaching Clay. The same consent was amended vide order no. H-103222 dated 31-07-2019 and H-107040 date 05-03-2020 for alternate mode of disposal of Gypsum. Copy of same is attached as an **Annexure-1.1**.

During the process of Bleaching clay manufacturing, Spent Sulphuric Acid is generated. The first wash of spent is sent to M/s. IFFCO Ltd. Kandla for utilization under Rule-9 of HWM Rules, 2016 and the subsequent dilute Sulfuric Acid from is neutralized with lime. During the neutralization of acidic wastewater Gypsum is generated, which is separated in the filter press and sent to Cement Industry for co-processing and backfilling of exhausted / abandoned mines as per the existing CCA.

During the period from 2017 to 2019 the unit has laid the said Gypsum in low laying areas near the factory premises. Total 34 no. of sites have been identified where this Gypsum was utilized for land reclamation, mine backfilling of exhausted mines, soil condition etc. As per the available data the unit have lifted Gypsum from 21 sites. However, practically it is difficult to lift Gypsum from remaining 13 sites as Gypsum has become integral part of existing land.

The unit is interested to carry out the study on soil inspection, sampling and analysis of these 21 sites from where the Gypsum has been lifted in and around factory premises through reputed institute. In turn, M/s. APL entrusted M/s. Gujarat Industrial and Technical Consultancy Organization Ltd. (GITCO), Ahmedabad to undertake the said study. GITCO is a recognized Schedule-I Environment Auditor of Gujarat Pollution Control Board (GPCB) and its laboratory is NABL accredited. Copy of the same is attached as an **Annexure-1.2**.

This study report present Soil inspection, sampling and analysis in and around the 21 sites where Gypsum was laying. The soil samples have been collected, analyzed and interpreted to assess the present status of soil conditions in and around 21-identified sites, and certify that Gypsum has been lifted & sites have been cleared.



## 1.2 SITE DESCRIPTION:

The identified 21 sites along with its details is shown in **Table 1.1**.

The site location map is shown in **Figure No.1.1**.

Google Image of the study area is shown in **Figure No. 1.2**.

**Table No. 1.1**  
**Details of 21-Selected sites**

Location	Name	Latitude	Longitude
S1	Beside water tank of GWIL Sump, Kukma Village	23°13'18" N	69°45'46" E
S2	Land opposite and beside Paddhar Village police station	23°14'29" N	69°48'38" E
S3	Behind Balaji Petrol Pump, Shaikhpur Chokdi, BhujAnjar Highway	23°13'41" N	69°45'44" E
S4	Near Matiyadev Mandir, Kukma Village, Near Kukma Water Distribution Tank	23°14'03" N	69°46'15" E
S5	Land between Swaminarayan wadi and Water sump of GWIL, Kukma Village	23°14'50" N	69°45'45" E
S6	Natural Drain near Sanjot nagar, Behind Swaminarayan wadi	23°12'48" N	69°46'08" E
S7	North side of Swaminarayan wadi	23°12'50" N	69°46'90" E
S8	Opposite to Lehriya Hanuman Temple, Kukma Bhuj Road, Kukma Village	23°13'12" N	69°46'17" E
S9	Vavdi Village	23°11'35" N	69°49'42" E
S10	Land of Hetubha Jadeja, Ler Village		
	A Near Block Factory, Village Ler	23°12'06" N	69°45'34" E
	B At Block Factory, Village Ler	23° 12'05" N	69°45'35" E
	C Near Block Factory, Village Ler	23° 12'03" N	69°45'34" E
S11	Near APL plant, Land at Village Bhujodi	23°12'43" N	69°44'28" E
S12	Near toll gate, Lakhond	23°15'36" N	69°46'48" E
S13	Vavdi Village, Opp. Survey No. 85/1.	23°11'31" N	69°49'45" E
S14	Beside Lehriya Hanuman Temple, Kukma village	23°13'24" N	69°46'19" E
S15	At Dargah Village, Lakhond	23°15'31" N	69°46'55" E
S16	A At Village Lakhond	23°15'39" N	69°46'44" E
	B At Village Lakhond	23°15'36" N	69°46'48" E

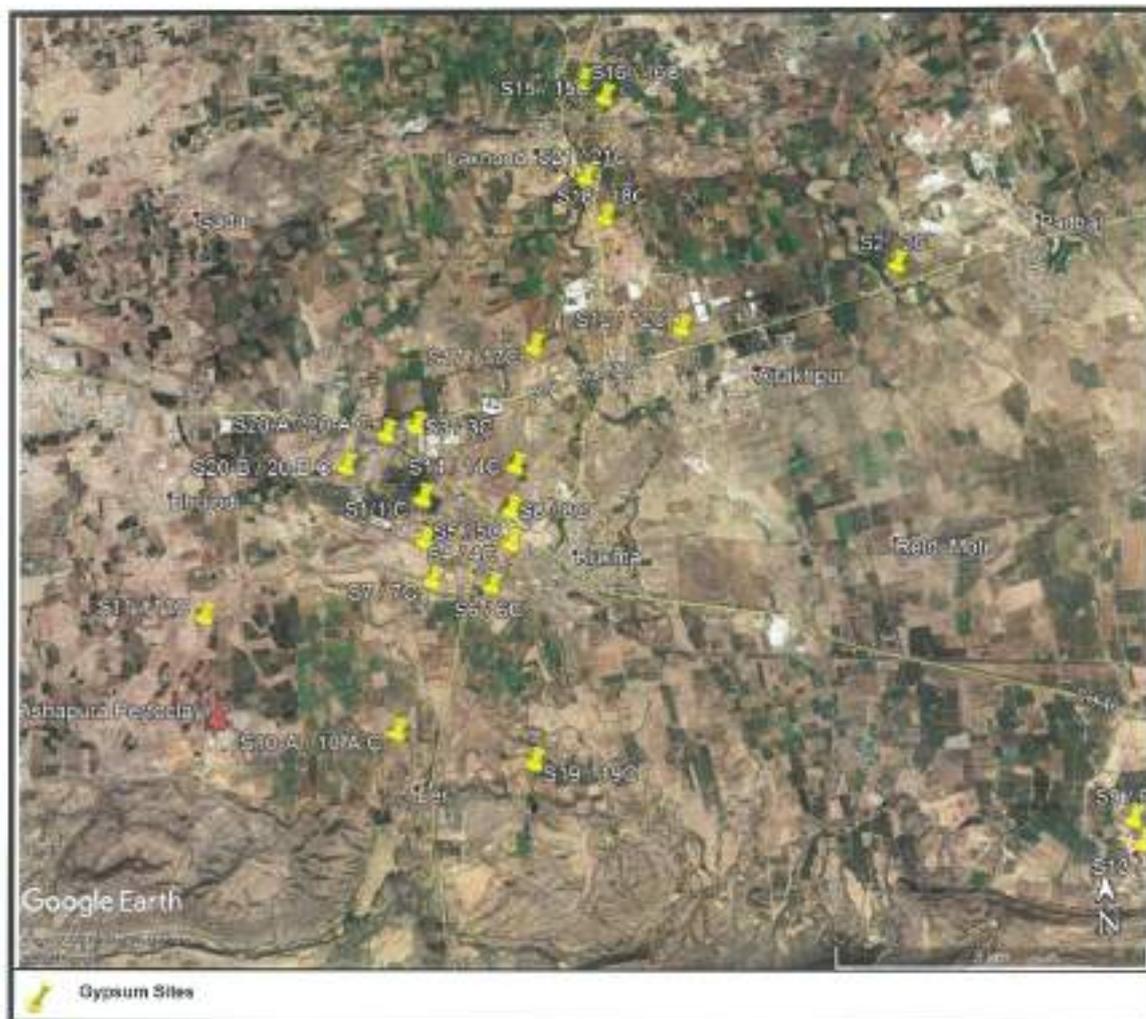


S17	Behind Ashapura Foundation school, Ashapura Colony, Bhachau Road, Kukma	23°14'07" N	69°46'26" E
S18	Farm on Lakhond Road	23°14'49" N	69°46'52" E
S19	Beside Balubha Rathod's Lake, Ler Village	23°11'47" N	69°46'17" E
S20	A At shekpir parle	23°13'40" N	69°45'33" E
	B At shekpir parle	23°13'33" N	69°45'28" E
S21	Lakhond- kali Talavadi Road, Village Lakhond	23°15'03" N	69°46'48" E





**Figure No. 1.2.**  
**Google Image of The Study Area**



## 1.2 SCOPE & METHODOLOGY

- A desk base study was carried out on available information of the site along with process details viz. regarding raw material, process chemicals manufacturing process, sources and quantity of Gypsum and overview of process that generates Gypsum.
- Preliminary site visit to observe the area where these sites are located for formulating sampling and monitoring plan.
- Collect available soil samples from in & around all identified 21 sites. One representative soil sample from virgin sites to compare the analysis results. Analysis of soil sample was done for physico-chemical parameters.
- Limited Sampling and testing were carried out to assess the impact and identify possible soil receptors pathways.
- Available Soil samples were collected from in & around all identified 21 Gypsum sites. At each site, one virgin sample of soil was also collected to assess the base quality of soil. The soil samples were analyzed for physico-chemical parameters, Metal content and Gypsum content.
- Screening, review and comparison of the Results will be done. For Soil Sample assessment, they will be compared with virgin samples and screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines "Guidance document for assessment and remediation of contaminated sites in India, 2015".
- Incorporating above all and preparation of report.

## 1.3 LIMITATIONS

The report is based upon the application of scientific principles and professional judgment to certain facts with resultant subjective interpretations. Professional judgments expressed herein are based on the facts, currently available within the limits of the existing data, scope of work, budget and schedule. To the extent that more definitive conclusions are desired by Client than are warranted by the currently available facts, it is specifically GITCO's intent that the conclusions and recommendations stated here in will be intended as guidance ad not necessarily a firm course of action except where explicitly stated as such. The information provided to Client in this report is not be construed as legal advice.



## 2.0 BACKGROUND OF THE STUDY

### 2.1 SITE HISTORY:

The Gypsum was laid at 34 identified sites. The status of same is presented at Table No. **Table No. 2.1**. As per available data the unit have lifted 21271 tonne of Gypsum from the 21 sites. It is practically difficult to lift Gypsum from remaining 13 sites, as these sites have become integral part of existing land.

**Table No. 2.1**  
**Status of 34 Gypsum Sites**

DETAILS OF 21 SITES FROM WHERE GYPSUM IS REMOVED			
Sr. No.	Location	Status	Quantity (t)
1.	Besides of water tank of GWIL Sump, Kukma Village 23°13'18" N, 69°45'46" E	Site cleared	1149
2.	Land opposite and besides of Paddhar Village police station 23°14'29" N, 69°48'38" E	Site Cleared	561
3.	Behind Balaji Petrol Pump, Shaikhpir Chokdi, Bhuj Anjar Highway 23°13'41" N, 69°45'44" E	Site Cleared	907
4.	Near Matiyadev Mandir, Kukma Village, Near Kukma Water Distribution Tank 23°14'03" N, 69°46'15" E	Site Cleared	303
5.	Land between Swaminarayan vadi and Water sump of GWIL, Kukma Village 23°14'50" N, 69°45'45" E	Site Cleared	3068
6.	Natural Drain near Sanjot nagar, Behind Swaminarayanwadi 23°12'48" N, 69°46'08" E	Site Cleared	1535
7.	North side of Swaminarayan wadi 23°12'50" N, 69°46'90" E	Site Cleared	2757
8.	Opposite to Lehriya Hanuman Temple, Kukma Bhuj Road, Kukma Village 23°13'12" N, 69°46'17" E	Site cleared	551
9.	Vavdi Village 23°11'35" N, 69°49'42" E	Site cleared	1266



Sr. No.	Location	Status	Quantity (t)
10.	Land of Hetubha Jadeja, Ler Village	Site cleared	85
A	Near Block Factory, Village Ler 23°12'06" N, 69°45'34" E		
B	At Block Factory, Village Ler 23°12'05" N, 69°45'35" E		
C	Near Block Factory, Village Ler 23°12'03" N, 69°45'34" E		
11.	Land at Village 23°12'43" N, 69° 44'28" E	Site cleared	380
12.	Near toll gate lakhond 23°15'36" N, 69°46'48" E	Site cleared	1391
13.	Vavdi Village, Opp. Of Survey No. 85/1 23°11'31" N, 69°49'45" E	Site cleared	296
14.	Beside Lehriya Hanuman Temple, Kukma Village 23°13'24" N, 69°46'19" E	Site cleared	112
15.	At Dargah Village, Lakhond 23°15'31" N, 69°46'55" E	Site cleared	3580
16.	A At Village Lakhond 23°15'39" N, 69°46'44" E	Site Cleared	22
	B At Village Lakhond 23°15'36" N, 69°46'48" E	Site Cleared	699
17.	Behind Ashapura Foundation school, Ashapura Colony, Bhachau Road, Kukma 23°14'07" N, 69°46'26" E	Site Cleared	187
18.	Farm on Lakhond Road, 23°14'49" N, 69°46'52" E	Site Cleared	1061
19.	Besides Balubha Rathod's Lake Ler Village 23°11'47" N, 69°46'17" E	Site Cleared	238
20	A At shekhpri parle 23°13'40" N, 69°45'33" E	Site Cleared	902
	B At shekhpri parle 23°13'33" N, 69°45'28" E	Site Cleared	43
21.	Lakhond- kali Talavadi Road, Village Lakhond 23°15'03" N, 69°46'48" E	Site Cleared	178
<b>TOTAL</b>			<b>21271</b>



STATUS OF REMAINING 13 GYPSUM SITES		
Sr. No.	Location	Site Status
22.	Beside Kukma- Lakhond Village Road 23°13' 50" N, 69°46'48" E	PUBLIC INFRASTRUCTURE (Sewage line- Gypsum used for providing structural support.)
23.	Natural drain between farm of Dinesh Maharaj and Govind Vankar, Kukma Village 23°11'56" N, 69°46'47" E	Plantation i.e. Neem, Gulmahor etc. are growing and Gypsum is being used as a soil conditioner.
24.	Shri Vankalmata Mandir 23°13'35" N, 69°44'41" E	Crops growing and Gypsum is being used as a soil conditioner.
25.	Vrundavan Gir Gaudham, Shree Swaminarayan Mandir, Besides Ashapura Colony, Bhachau Road, 23°13'49" N, 69°46'48" E	Gowshala/ Cowshed
26.	Pithoradada Mandir Ler Village 23°10'23"N, 69°46'05" E	Temple
27.	Land of Lakhond Village 23°15'12"N, 69°46'41" E	Land Reclamation
28.	Adjacent site of site no. 28, Land of Lakhond Village 23°15'10" N, 69°46'44" E	Land Reclamation
29.	On Government Land, Padhdhar Village 23°14'29" N, 69°48'44" E	Land Reclamation
30.	Mangal Mandir School Village 23°13'45" N, 69° 44'08" E	Land Reclamation
31.	Behind Lehriya Hanuman Temple, Kukma Village 23°13'21" N, 69°46'21" E	Backfilling in Abandoned Mines
32.	Beside old Hot Mix plant, Kukma Village 23°13'20" N, 69°46'03" E	
33.	Behind khatri mills, Beside of above site, Traverse, Government land, Kukma Village 23°13'20" N, 69°45'58" E	
34.	Village Lakhond 23°15'39" N, 69°47'17" E	



## SUMMARY FOR STATUS GYPSUM SITE RESTORATION

- Site nos. 1-21 have been cleared completely.
- Site no. 22 is a sewage line wherein Gypsum has been used for leveling and it gives structural support for sewerage line passing.
- Site nos.23 is an agricultural site wherein crops viz. Castor Beans and Cotton, are growing and Gypsum is being used as a soil conditioner and also at Site nos. 24, Neem & Gulmahor are growing and Gypsum is being used as a soil conditioner.
- At Site nos. 25 there is construction of Gowshala and Cow Shed and at site no. 26, Temple is there so the unit could not remove Gypsum.
- In site nos. 27-30, Gypsum has been used to level land and it has become an integral part, therefore difficult to lift.
- Site nos. 31-34 are abandoned mines wherein Gypsum has been utilized for backfilling as per EC conditions. It is pertinent to note that as per EC condition **SEIAA/ GUJ/ EC/ 2(b)/ 497/2016** Gypsum could be utilized in backfilling of abandoned mines.



## 2.2 PRODUCTION DETAILS:

The unit is manufacturing bleaching clay since 2001. The production details are shown hereunder in **Table No. 2.2**

**Table: 2.2**  
**Production Details**

Sr. No.	Product Name	Production (t/Month)
1	Bleaching Clay	12000

Copy of CCA is attached as an **Annexure-1.1**.

## 2.3 MANUFACTURING PROCESS DETAILS

Bleaching clay is manufactured from the best quality, selectively mined and scientifically blended under stringent process controls. Bentonite and Sulphuric acid are main raw material and mainly five steps are involved in production of Acid Activated Bleaching clay are: [A] Granulation Section, [B] Acid Activation, [C] Drying, [D] Pulverization, [E] Neutralization & Filtration.

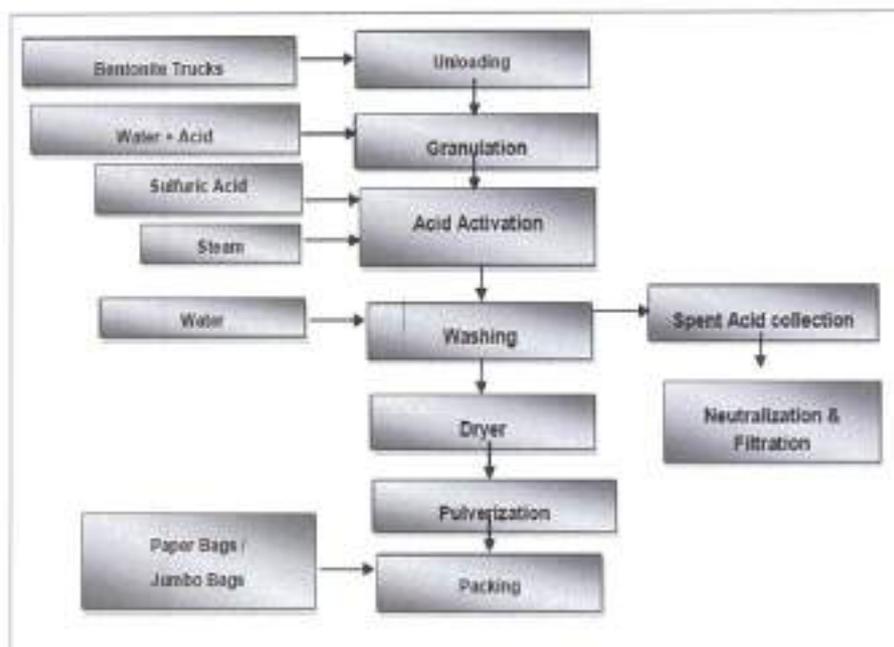
Bentonite is charged in hopper and send to crusher for crushing then it is sent to granulator. These granules are then carried to desired reactor in acid activation plant. In acid activation operation required concentration of Sulphuric acid is prepared in the selected reactor, it continues for 12 – 14 hours. After completion of acid activation, granules are washed away with water. The first hour drain is collected as spent acid which is send to IFFCO for utilization. Activated granules are discharged in bin storage area for subsequent drying process. Wet granules are fed in Rotary-Dryer. Dried granules at outlet of dryer are stored in hoppers from where it is transferred to mill hopper. Material is continuously fed by rotary valve to pulverization Mill. Pulverized material from mill is collected in storage hopper and packing done as per the requirement

Bleaching Earth is an active adsorbent used for the general purpose of refining of edible and non-edible oil.

The process flow diagram is shown in **Figure No. 2.1:**



Figure No. 2.1  
Process Flow Diagram of Bleaching Earth



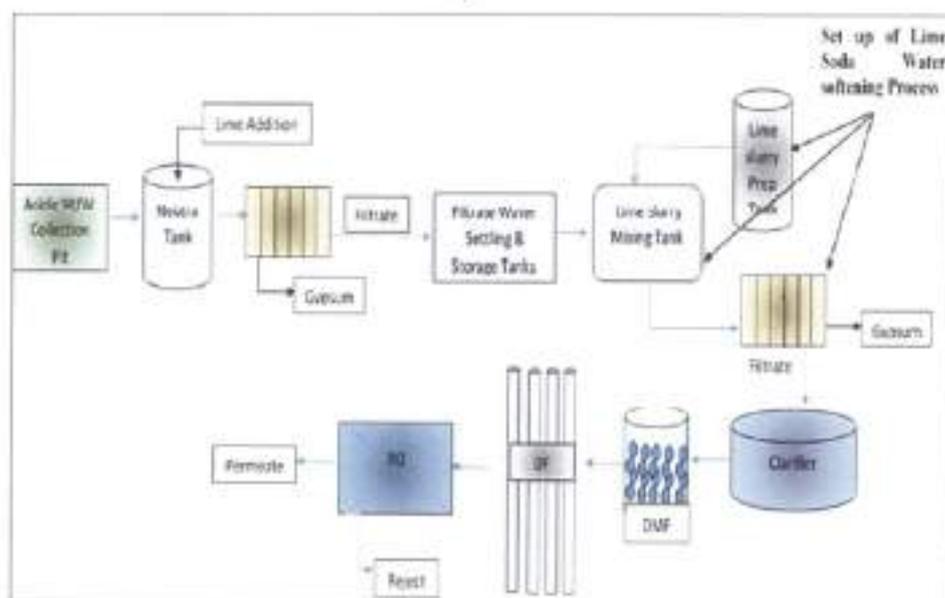
## 2.4 EFFLUENT TREATMENT PLANT:

After completion of acid activation process, acidic wastewater is carried to neutralization tank by pump. For neutralization, where lime is added to reactor. Then it is circulated by means of agitator in reactor for getting 7 pH. The total cycle time is 6-7 hours; after the neutralization process, the slurry is transferred to filter press by means of high-pressure pump. Gypsum which will remain in clothes of press is removed manually and transferred to storage area for sun drying. To increase water recycling and remove hardness the unit carried out soda lime softening process; by addition of lime slurry, filtrate water pH will rise to 11 so hardness will be removed and excess sulphate will precipitate. This slurry is sent to filter press where filtrate and Gypsum are separated. Filtrate is sent to clarifier where various dosing of soda ash, pH correction and polyelectrolyte is given. After proper settlement it is feed to ultra-filtration and dual media filter. Then it sent to RO operation where RO permeate water is reused in process and gardening and remaining RO reject water is sent to solar evaporation pond. The flow diagram is shown at **Figure No. 2.2.**

Gypsum is dried and is sent to cement industry for co-processing and/or sent for backfilling of exhausted/abandoned mines.

The unit had installed Sewage Treatment Plant of capacity 10 KLD to treat sewage generated from the unit. Treated Sewage water is used for gardening.

**Figure No. 2.2**  
**Flow Diagram of ETP**



## 2.5 GYPSUM -SOURCES & GENERATION

### 2.5.1 SOURCES OF GYPSUM GENERATION:

Gypsum is by-product and it is recovered from neutralization & filtration process & utilized in cement industry and backfilling of abandoned mines.

### 2.5.2 GENERATION, HANDLING & DISPOSAL OF GYPSUM:

The details of generation of the Gypsum is as follows:

#### GYPSUM GENERATION &MANAGEMENT:

1	Production (t/Month)	:	12000
2	Generation of Gypsum Sludge (t/year)	:	54000
3	Generation of Gypsum(kg/t)	:	375
4	Generation of Gypsum (t/day)	:	150
5	Consent/Authorization	:	Consolidated Consent & Authorization (CC&A) by Gujarat Pollution Control Board, vide Order No: AWH 93521 dated 11-06-2018, which is valid up to 24-06-2023 for manufacturing of Bleaching Clay and the same was amended vide order no. H-103222 dated 31/07/2019 and H-107040 date 05/03/2020 for alternate mode of Gypsum disposal. Copy of the same is attached as an <b>Annexure- 1.1</b> .
6	Mode of disposal	:	As per CCA Gypsum waste generated from neutralization of Spent Acid, shall be cement industry for co-processing <b>And</b> Alternate mode of disposal of Gypsum waste generated from neutralization of spent acid, to mines for back filling, in the abandoned mines only when cement industries are not in operation and or not accepting the gypsum for co-processing.



7	Legal Status of Gypsum:	: MoEF CC vide Letter No. F. No.23-161/2014-HSMD has classified Gypsum as non-hazardous based on the analysis done by Polucon Lab (MoEF Approved) for Schedule II parameters (as per HWM Rules2008) in 2014; Letter of MoEF is enclosed vide <b>Annexure 2.1</b> .
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### 3.0 INSPECTION, SAMPLING & ANALYSIS IN & AROUND 21 SITES

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#### 3.1 SAMPLING & ANALYSIS - SOIL SAMPLE

1. Prior to sample collection, top soil cover was studied by visual observation before collecting actual soil samples.
2. Variations in color, texture were noticed during the field visit.
3. Two soil samples were collected, one soil sample from just near to the site (<50 m) and another virgin sample away from the site (30 to 50 mts.).
4. Soil samples were collected at the depth of 2 meter. Soil samples were collected with the help of JCB and labeled.
5. The samples were put in zip-lock bag that were marked with unique sample identification no. and date of collection.
6. All the soil samples were carefully transported to laboratory.
7. The visual observation of the characteristics of the sample was recorded in the field note.

#### 3.1.1 ANALYSIS OF SAMPLES - SOIL SAMPLE

- The Gypsum in soil samples were analyzed through Detox Corporation Pvt. Ltd. Lab Division (MoEF Recognized and NABL Accredited Laboratory), Surat, Gujarat. The copy of the same is attached as an **Annexure- 3.1**.
- The soil parameters that were analyzed and method of analysis is presented below in **Table No. 3.1**. The relevant analysis reports are presented and discussed at site assessment.



**Table No. 3.1**  
**Methodology of Testing of Soil Samples**

Soil Parameters	Method name	
Moisture	IS 2720: Part 9:1992	
pH	As per methods specified in "Methods Manual, Soil Testing in India, Department of Agriculture and Cooperation Ministry of Agriculture, GOI	
Conductivity		
Calcium		
Sodium		
Potassium		
Ammonia		
Nitrate		
Sulphate		
Zinc		5 % Acid Leachate to be made and analyzed by using instrument ICP-OES.
Copper		
Nickel		
Chromium		
Cadmium		
Lead		
Manganese		
Cobalt		
Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$	SOP DCPL/SO/Gypsum contain /031, Date 01-01-2020	



## 3.2 SITE ASSESSMENT

### 3.2.1 S1- Beside water tank of GWIL Sump, Kukma Village

<b>Location</b>	: Beside water tank of GWIL Sump, Kukma Village Latitude: 23°13'18" N Longitude: 69°45'46" E
<b>Site Photographs:</b>	: Please refer Photograph of site presented at <b>Figure No 3.1</b>
<b>Google Image</b>	: Site location map along with sample location is presented at <b>Figure No. 3.2.</b>
<b>Soil Analysis</b>	: Soil analysis report is presented at <b>Table No. 3.2</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  At Gypsum site, low elevated levels of mineral contents viz. Ca, Na, K and $\text{SO}_4$ were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient, Calcium and Sulphur are secondary major plant nutrients in soil and they are categorized as essential nutrients for plant growth.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF(*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Inspection Report</b>	: Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



**Figure No. 3.1**  
**Photograph of Site-S1**  
**Besides of water tank of GWIL Sump, Kukma Village**



**Figure No. 3.2**  
**Location Map Before & After Lifted of Gypsum along with Soil Samples for**  
**Site S1- Besides of water tank of GWIL Sump, Kukma Village**



**Before Lifting Gypsum**



**After Lifting Gypsum**

S1/1 C	Soil Sample from site
S1/1 B	Virgin Soil Sample near Gypsum site area



**Table No.3.2**  
**Soil Analysis Report- Site S1**  
**Besides of water tank of GWIL Sump, Kukma Village**

Sr. No.	Parameters	S1/1 C Soil Sample from site	S1/1 B Virgin Soil Sample near Gypsum site area
1	Moisture %	5.70	5.22
2	pH	7.36	7.25
3	Conductivity, mS/cm	2.190	0.894
4	Calcium, g/Kg	3.80	0.72
5	Sodium, g/Kg	10.0	0.4
6	Potassium, g/Kg	0.5	BDL
7	Sulphate, g/Kg	0.74	0.22
8	Ammonia, g/Kg	0.013	0.011
9	Copper, g/Kg	0.015	0.014
10	Nickel, g/Kg	0.010	0.009
11	Zinc, g/Kg	0.018	0.017
12	Cadmium, g/Kg	0.001	BDL
13	Lead, g/Kg	0.014	0.013
14	Chromium, g/Kg	0.004	0.02
15	Manganese, g/Kg	0.012	0.06
16	Cobalt, g/Kg	0.005	0.004
17	Nitrate, g/Kg	BDL	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit



### 3.2.2 S2 - Land opposite and besides of Paddhar Village police station

Location	:	Land opposite and besides of Paddhar Village police station  Latitude: 23°14'29" N Longitude: 69°48'38" E
Site Photographs:	:	Please refer Photograph of site presented at <b>Figure No 3.3.</b>
Google Image	:	Site location map along with sample location is presented at <b>Figure No. 3.4.</b>
Soil Analysis	:	Soil analysis report is presented at <b>Table No. 3.3.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  At Gypsum site, low elevated levels of mineral contents viz. Ca, Na, K and $\text{SO}_4$ were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient, Calcium and Sulphur are secondary major plant nutrients in soil and they are categorized as essential nutrients for plant growth.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
Inspection Report	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



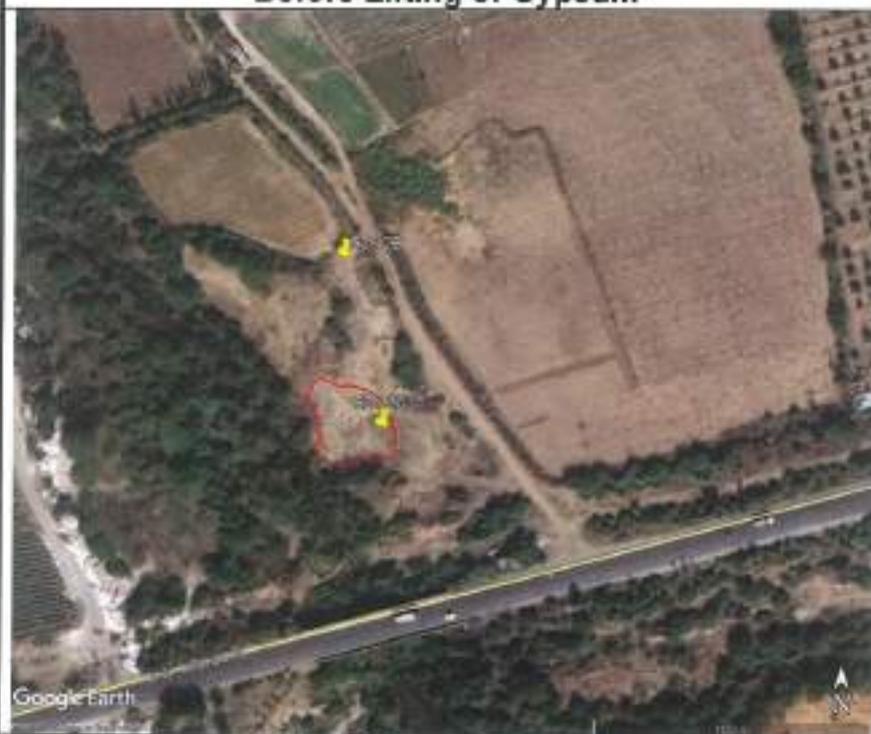
Figure No. 3.3  
Photograph of Site S2 –  
Land opposite and besides of Paddhar Village police station



**Figure No. 3.4**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S2 - Land opposite and besides of Paddhar Village police station**



**Before Lifting of Gypsum**



**After Lifting of Gypsum**

S2/2 C	Soil Sample from site
S2/2 B	Virgin Soil Sample near Gypsum site area



**Table No. 3.3**  
**Soil Analysis Report- Site S2 -**  
**Land opposite and besides of Paddhar Village police station**

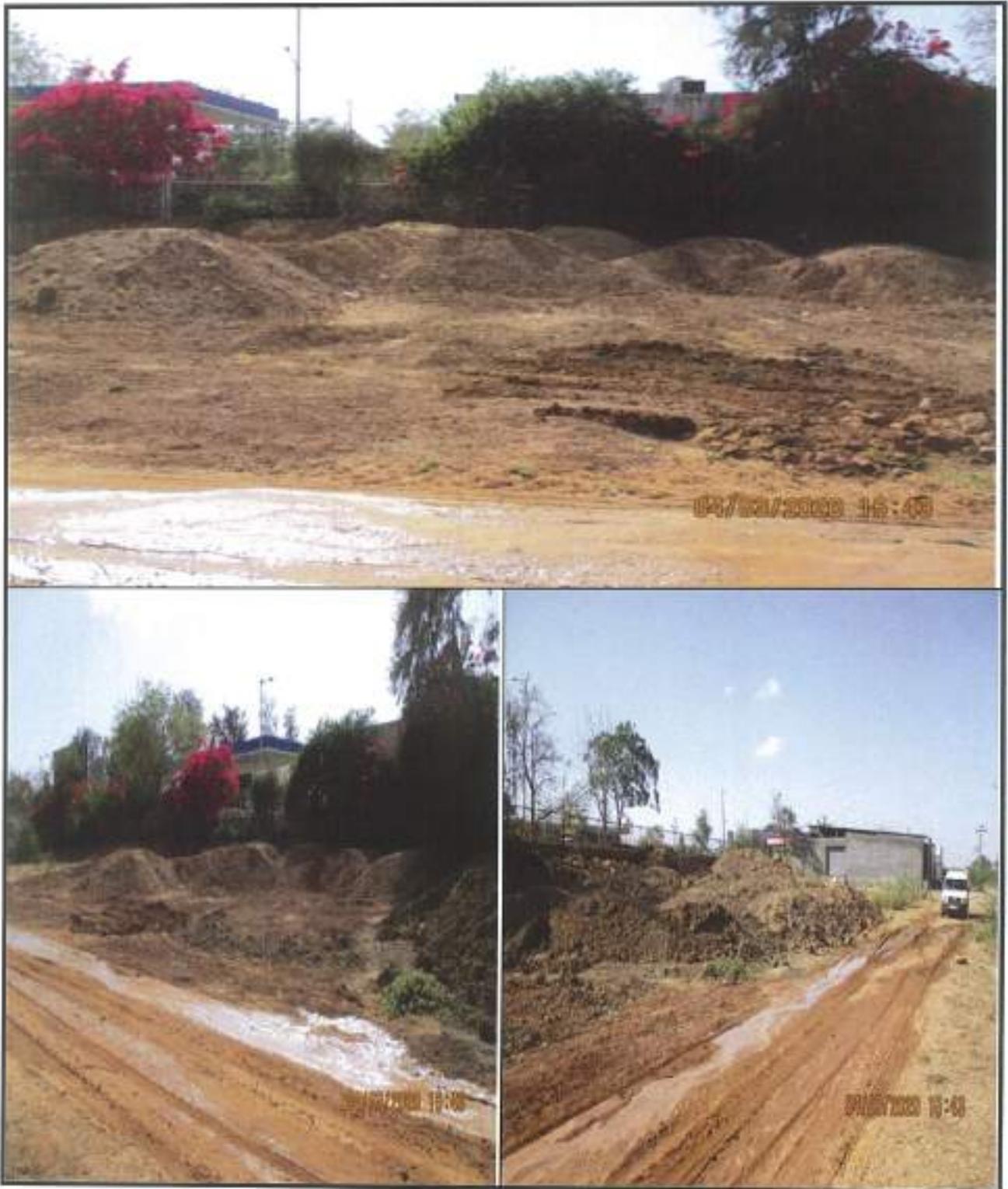
Sr. No.	Parameters	S2/2 C Soil Sample from site	S2/2 B Virgin Soil Sample near Gypsum site area
1	Moisture %	7.40	5.84
2	pH	7.89	7.92
3	Conductivity, mS/cm	2.388	1.030
4	Calcium, g/Kg	4.41	3.77
5	Sodium, g/Kg	10.2	6.0
6	Potassium, g/Kg	2.2	1.6
7	Sulphate, g/Kg	1.04	0.40
8	Ammonia, g/Kg	0.009	0.007
9	Copper, g/Kg	0.039	0.034
10	Nickel, g/Kg	0.032	0.031
11	Zinc, g/Kg	0.033	0.034
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.015	0.012
14	Chromium, g/Kg	0.060	0.050
15	Manganese, g/Kg	0.362	0.210
16	Cobalt, g/Kg	0.013	0.013
17	Nitrate, g/Kg	0.02	0.02
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit





**Figure No. 3.5**  
**Photograph of Site S 3-**  
**Behind Balaji Petrol Pump, Shaikhpur Chokdi, Bhuj Anjar Highway**



**Figure No. 3.6**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S3-Behind Balaji Petrol Pump, Shaikhpur Chokdi, Bhuj Anjar Highway**



**Table No. 3.4**  
**Soil Analysis Report of Site S3-**  
**Behind Balaji Petrol Pump, Shaikhpur Chokdi, Bhuj Anjar Highway**

Sr. No.	Parameters	S3/3 C Soil Sample from site	S3/3 B Virgin Soil Sample near Gypsum site area
1	Moisture %	6.22	4.74
2	pH	7.38	7
3	Conductivity, mS/cm	1.075	0.342
4	Calcium, g/Kg	2.84	1.36
5	Sodium, g/Kg	5.2	0.8
6	Potassium, g/Kg	1.6	0.1
7	Sulphate, g/Kg	0.65	0.22
8	Ammonia, g/Kg	BDL	BDL
9	Copper, g/Kg	0.033	0.030
10	Nickel, g/Kg	0.027	0.020
11	Zinc, g/Kg	0.052	0.05
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.012	0.010
14	Chromium, g/Kg	0.101	0.090
15	Manganese, g/Kg	0.215	0.190
16	Cobalt, g/Kg	0.010	0.010
17	Nitrate, g/Kg	0.01	0.01
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL



### 3.2.4 S4 - Near Matiyadev Mandir, Kukma Village, Near Kukma Water Distribution Tank

<b>Location</b>	: Near Matiyadev Mandir, Kukma Village, Near Kukma Water Distribution Tank  Latitude: 23°14'03" N Longitude: 69°46'15" E
<b>Site Photographs:</b>	: Please refer Photograph of site presented at <b>Figure No 3.7.</b>
<b>Google Image</b>	: Site location map along with sample location is presented at <b>Figure No. 3.8.</b>
<b>Soil Analysis</b>	: Soil analysis report is presented at <b>Table No. 3.5.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  At Gypsum site, low elevated levels of mineral contents viz. Na and K were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient in soil and it is categorized as essential nutrient for plant growth.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Inspection Report</b>	: Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



**Figure No. 3.7**  
**Photograph of Site S4-**  
**Near Matiyadev Mandir, Kukma Village, Near Kukma Water Distribution Tank**



**Figure No. 3.8**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S4 - Near Matiyadev Mandir, Kukma Village**



**Table No. 3.5**  
**Soil Analysis Report Site S4 -**  
**Near Matiyadev Mandir, Kukma Village, Near Kukma Water Distribution Tank**

Sr. No.	Parameters	S4/4 C Soil Sample from site	S4/4 B Virgin Soil Sample near Gypsum site area
1	Moisture %	5.30	4.90
2	pH	7.34	7.17
3	Conductivity, mS/cm	0.687	0.224
4	Calcium, g/Kg	0.96	0.72
5	Sodium, g/Kg	5.6	1.0
6	Potassium, g/Kg	2.2	BDL
7	Sulphate, g/Kg	0.25	0.20
8	Ammonia, g/Kg	BDL	BDL
9	Copper, g/Kg	0.02	0.02
10	Nickel, g/Kg	0.02	0.02
11	Zinc, g/Kg	0.02	0.03
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.01	0.01
14	Chromium, g/Kg	0.03	0.03
15	Manganese, g/Kg	0.090	0.005
16	Cobalt, g/Kg	0.01	0.01
17	Nitrate, g/Kg	0.01	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit



### 3.2.5 S5 - Land between Swaminarayan wadi and Water sump of GWIL, Kukma Village

<b>Location</b>	:	Land between Swaminarayan wadi and Water sump of GWIL, Kukma Village  Latitude: 23°14'50" N Longitude: 69°45'45" E
<b>Site Photographs:</b>	:	Please refer Photograph of site presented at <b>Figure No 3.9.</b>
<b>Google Image</b>	:	Site location map along with sample location is presented at <b>Figure No. 3.10.</b>
<b>Soil Analysis</b>	:	Soil analysis report is presented at <b>Table No. 3.6</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  Level of mineral contents at Gypsum site is at par with virgin soil quality. Thus, there will not be any detrimental effect on soil quality.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Inspection Report</b>	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

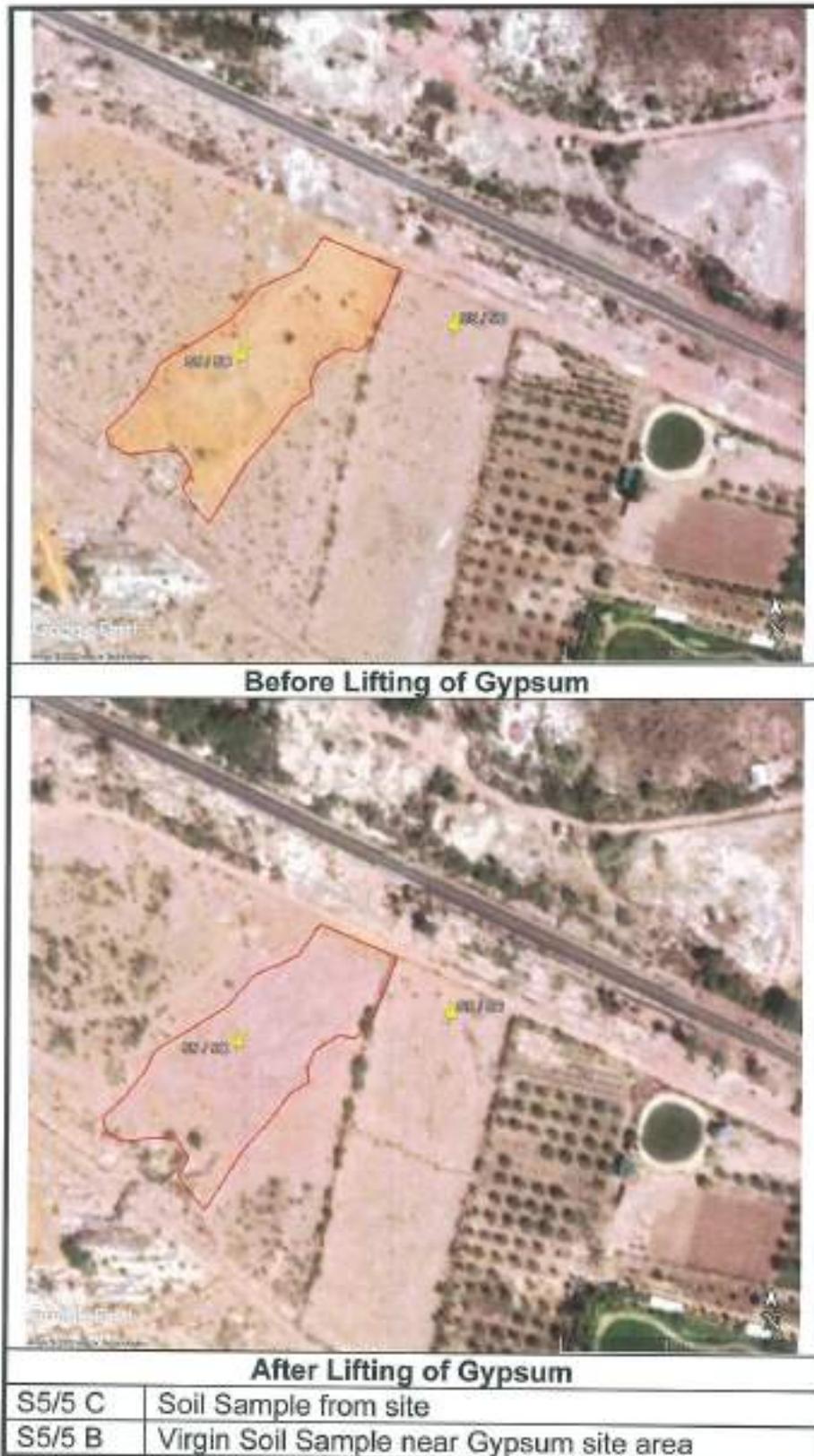
**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



**Figure No. 3.9**  
**Photograph of Site S5 –**  
**Land between Swaminarayan wadi and Water sump of GWIL, Kukma Village**



**Figure No. 3.10**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for Site S5 - Land between Swaminarayan wadi and Water sump of GWIL, Kukma**



**Table No. 3.6**  
**Soil Analysis Report Site S5 -**  
**Land between Swaminarayan wadi and Water sump of GWIL, Kukma Village**

Sr. No.	Parameters	S5/5 C Soil Sample from site	S5/5 B Virgin Soil Sample near Gypsum site area
1	Moisture %	4.80	5.12
2	pH	7.30	7.00
3	Conductivity, mS/cm	1.124	0.328
4	Calcium, g/Kg	0.32	0.28
5	Sodium, g/Kg	1.4	1.0
6	Potassium, g/Kg	1.4	0.8
7	Sulphate, g/Kg	0.21	0.20
8	Ammonia, g/Kg	0.026	0.017
9	Copper, g/Kg	0.015	0.01
10	Nickel, g/Kg	0.01	0.01
11	Zinc, g/Kg	0.024	0.02
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	BDL	BDL
14	Chromium, g/Kg	0.02	0.02
15	Manganese, g/Kg	0.009	0.050
16	Cobalt, g/Kg	BDL	BDL
17	Nitrate, g/Kg	BDL	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit



### 3.2.6 S6 - Natural Drain near Sanjot nagar, Behind Swaminarayan wadi

<b>Location</b>	: Natural Drain near Sanjot nagar, Behind Swaminarayan wadi  Latitude: 23°12'48" N Longitude: 69°46'08" E
<b>Site Photographs:</b>	: Please refer Photograph of site presented at <b>Figure No 3.11.</b>
<b>Google Image</b>	: Site location map along with sample location is presented at <b>Figure No. 3.12.</b>
<b>Soil Analysis</b>	: Soil analysis report is presented at <b>Table No. 3.7.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  At Gypsum site, low elevated levels of mineral contents viz. Na and K were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient in soil and it is categorized as essential nutrients for plant growth.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Inspection Report</b>	: Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



**Figure No. 3.11**  
**Photograph of Site - S6 –**  
**Natural Drain near Sanjot nagar, Behind Swaminarayanwadi**



**Figure No. 3.12**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S6 - Natural Drain near Sanjot nagar, Behind Swaminarayanwadi**



**Before Lifting of Gypsum**



**After Lifting of Gypsum**

S6/6 C	Soil Sample from site
S6/6 B	Virgin Soil Sample near Gypsum site area



**Table No. 3.7**  
**Soil Analysis Report - Site S6-**  
**Natural Drain near Sanjot nagar, Behind Swaminarayanwadi**

Sr. No.	Parameters	S6/6 C Soil Sample from site	S6/6 B Virgin Soil Sample near Gypsum site area
1	Moisture %	4.64	4.76
2	pH	7.50	7.42
3	Conductivity, mS/cm	1.343	0.582
4	Calcium, g/Kg	3.69	3.13
5	Sodium, g/Kg	20.8	3.2
6	Potassium, g/Kg	8.6	0.8
7	Sulphate, g/Kg	0.54	0.48
8	Ammonia, g/Kg	0.004	0.005
9	Copper, g/Kg	0.03	0.03
10	Nickel, g/Kg	0.04	0.04
11	Zinc, g/Kg	0.10	0.08
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.01	0.01
14	Chromium, g/Kg	0.07	0.08
15	Manganese, g/Kg	0.12	0.10
16	Cobalt, g/Kg	0.01	0.01
17	Nitrate, g/Kg	BDL	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit



### 3.2.7 S7- North side of Swaminarayan wadi

<b>Location</b>	:	North side of Swaminarayan wadi  Latitude: 23°12'50" N Longitude: 69°46'90" E
<b>Site Photographs:</b>	:	Please refer Photograph of site presented at <b>Figure No 3.13.</b>
<b>Google Image</b>	:	Site location map along with sample location is presented at <b>Figure No. 3.14.</b>
<b>Soil Analysis</b>	:	Soil analysis report is presented at <b>Table No. 3.8.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  At Gypsum site, low elevated levels of mineral contents viz. Ca, Na, K and $\text{SO}_4$ were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient, Calcium and Sulphur are secondary major plant nutrients in soil and they are categorized as essential nutrients for plant growth.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Inspection Report</b>	:	Based on our visual observations and soil analysis report it is inferred that: Gypsum has been lifted from the said site.

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



**Figure No. 3.13**  
**Photograph of Site-S7-**  
**North side of Swaminarayanwadi**



**Figure No. 3.14**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S7- North side of Swaminarayan wadi**



**Table No. 3.8**  
**Soil Analysis Report- Site S7-**  
**North side of Swaminarayan wadi**

Sr. No.	Parameters	S7/7 C Soil Sample from site	S7/7 B Virgin Soil Sample near Gypsum site area
1	Moisture %	4.94	4.90
2	pH	7.85	7.67
3	Conductivity, mS/cm	1.224	0.343
4	Calcium, g/Kg	3.69	2.15
5	Sodium, g/Kg	8.8	6.0
6	Potassium, g/Kg	2.4	1.8
7	Sulphate, g/Kg	0.66	0.29
8	Ammonia, g/Kg	0.007	0.006
9	Copper, g/Kg	0.01	0.01
10	Nickel, g/Kg	BDL	BDL
11	Zinc, g/Kg	0.01	0.01
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	BDL	BDL
14	Chromium, g/Kg	0.01	0.01
15	Manganese, g/Kg	0.04	0.03
16	Cobalt, g/Kg	BDL	BDL
17	Nitrate, g/Kg	BDL	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit



### 3.2.8 S8- Opposite to Lehriya Hanuman Temple, Kukma Bhuj Road, Kukma Village

<b>Location</b>	:	Opposite to Lehriya Hanuman Temple, Kukma Bhuj Road, Kukma Village  Latitude: 23°13'12" N Longitude: 69°46'17" E
<b>Site Photographs:</b>	:	Please refer Photograph of site presented at <b>Figure No 3.15.</b>
<b>Google Image</b>	:	Site location map along with sample location is presented at <b>Figure No. 3.16.</b>
<b>Soil Analysis</b>	:	Soil analysis report is presented at <b>Table No. 3.9.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  At Gypsum site, low elevated levels of mineral contents viz. Na and K were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient in soil and it is categorized as essential nutrient for plant growth.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Inspection Report</b>	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

Note: (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



Figure No. 3.15  
Photograph of Site S8-  
Opposite to Lehriya Hanuman Temple, Kukma Bhuj Road, Kukma Village



**Figure No. 3.16**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S8 – Opp. Lehriya Hanuman Temple, Kukma Bhuj Road, Kukma Village**



**Table No. 3.9**  
**Soil Analysis Report Site S8 –**  
**Opp. Lehriya Hanuman Temple, Kukma Bhuj Road, Kukma Village**

Sr. No.	Parameters	S8/8 C Soil Sample from site	S8/8 B Virgin Soil Sample near Gypsum site area
1	Moisture %	5.72	3.28
2	pH	7.90	8.82
3	Conductivity, mS/cm	0.507	0.305
4	Calcium, g/Kg	6.93	6.89
5	Sodium, g/Kg	7.8	4.4
6	Potassium, g/Kg	4.0	1.0
7	Sulphate, g/Kg	0.36	0.32
8	Ammonia, g/Kg	0.010	0.017
9	Copper, g/Kg	0.02	0.02
10	Nickel, g/Kg	BDL	0.02
11	Zinc, g/Kg	0.02	0.02
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	BDL	0.01
14	Chromium, g/Kg	BDL	0.05
15	Manganese, g/Kg	0.09	0.093
16	Cobalt, g/Kg	BDL	0.007
17	Nitrate, g/Kg	BDL	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit



## 3.2.9 S9 - Vavdi Village

<b>Location</b>	:	Vavdi Village  Latitude: 23°11'35" N Longitude: 69°49'42" E
<b>Site Photographs:</b>	:	Please refer Photograph of site presented at <b>Figure No 3.17</b> .
<b>Google Image</b>	:	Site location map along with sample location is presented at <b>Figure No. 3.18</b> .
<b>Soil Analysis</b>	:	Soil analysis report is presented at <b>Table No. 3.10</b> .  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  At Gypsum site, low elevated levels of mineral contents viz. Na and K were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient in soil and it is categorized as essential nutrient for plant growth.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Inspection Report</b>	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.  The photograph show, a layer of china clay is laid has been site after lifting of Gypsum from the site.

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2**.



Figure No. 3.17  
Photograph of Site-S9-  
Vavdi Village



**Figure No. 3.18**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S9-Vavdi Village**



**Before Lifting of Gypsum**



**After Lifting of Gypsum**

S9/9 C	Soil Sample from site
S9/9 B and S13/13 B	Common Virgin Soil Sample Nr. Gypsum site area



**Table No. 3.10**  
**Soil Analysis Report- Site S9 - Vavdi Village**

Sr. No.	Parameters	S9/9 C Soil Sample from site	S9/9 B and S13/13B Common Virgin Soil Sample near Gypsum site area
1	Moisture %	5.26	5.42
2	pH	7.96	7.52
3	Conductivity, mS/cm	0.624	0.209
4	Calcium, g/Kg	1.76	0.96
5	Sodium, g/Kg	4.0	1.2
6	Potassium, g/Kg	1.4	BDL
7	Sulphate, g/Kg	0.24	0.16
8	Ammonia, g/Kg	BDL	BDL
9	Copper, g/Kg	BDL	0.01
10	Nickel, g/Kg	BDL	0.01
11	Zinc, g/Kg	0.01	0.02
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	BDL	0.01
14	Chromium, g/Kg	BDL	BDL
15	Manganese, g/Kg	0.01	0.05
16	Cobalt, g/Kg	BDL	0.01
17	Nitrate, g/Kg	0.01	0.01
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit



### 3.2.10 S10/A- Land of Hetubha Jadeja Near Block Factory, Ler Village

Location	:	Land of Hetubha Jadeja Near Block Factory, Ler Village  Latitude: 23°12'06" N Longitude: 69°45'34" E
Site Photographs:	:	Please refer Photograph of site presented at <b>Figure No 3.19.</b>
Google Image	:	Site location map along with sample location is presented at <b>Figure No. 3.20.</b>
Soil Analysis	:	Soil analysis report is presented at <b>Table No. 3.11.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  At Gypsum site, low elevated levels of mineral contents viz. Na and K were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient in soil and it is categorized as essential nutrient for plant growth.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
Inspection Report	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

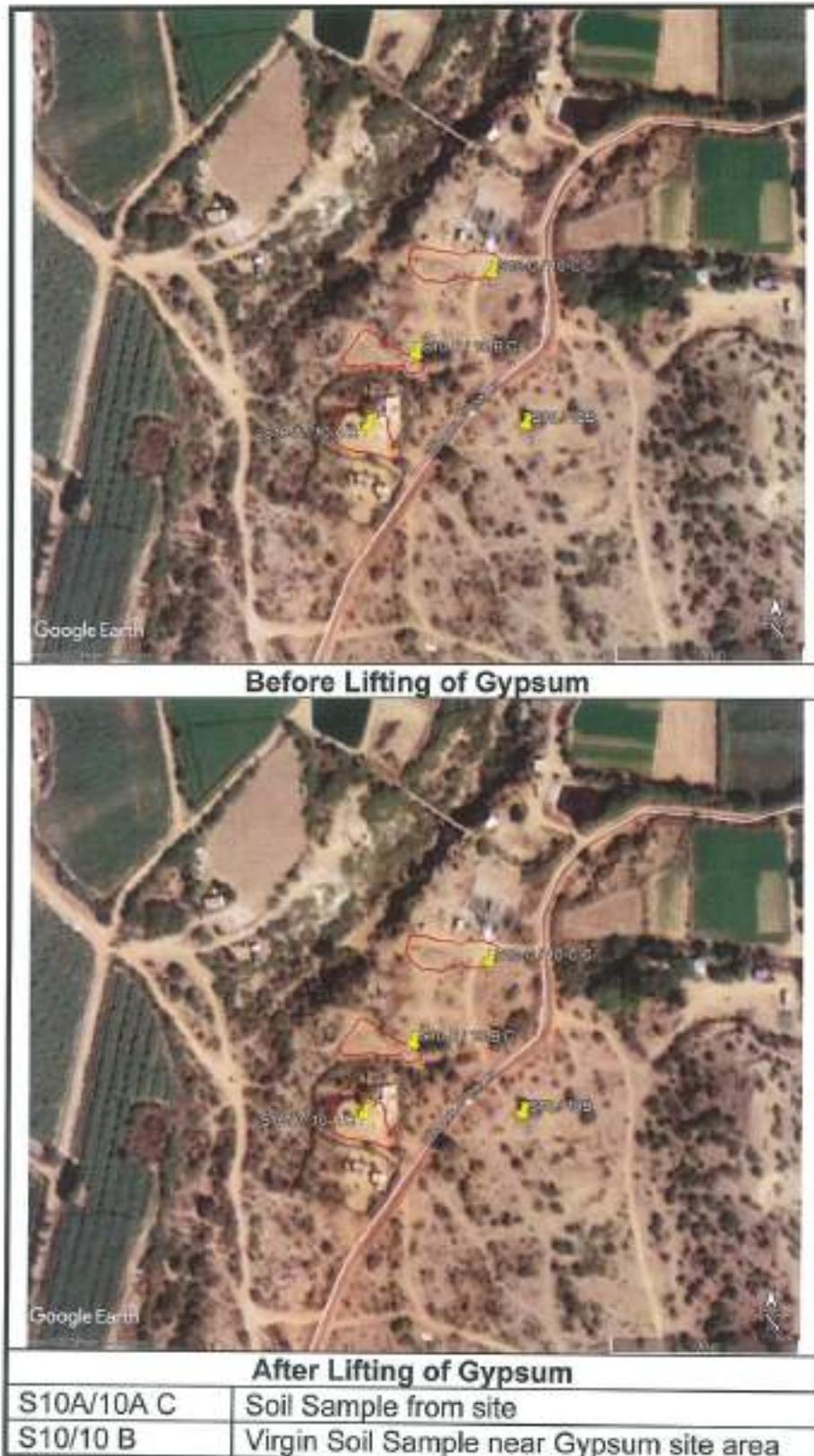
**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



**Figure No. 3.19**  
**Photograph of Site-S10/A-**  
**Land of Hetubha Jadeja Near Block Factory, Ler Village**



**Figure No. 3.20**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S10/A-Land of Hetubha Jadeja Near Block Factory, Ler Village**



**Table No. 3.11**  
**Soil Analysis Report- Site S10/A-**  
**Land of Hetubha Jadeja Near Block Factory, Ler Village**

Sr. No.	Parameters	S10A/10A C Soil Sample from site	S10/10 B Virgin Soil Sample near Gypsum site area
1	Moisture %	5.34	4.90
2	pH	7.72	7.80
3	Conductivity, mS/cm	0.278	0.115
4	Calcium, g/Kg	1.19	1.09
5	Sodium, g/Kg	3.0	1.4
6	Potassium, g/Kg	1.8	0.4
7	Sulphate, g/Kg	0.18	0.12
8	Ammonia, g/Kg	0.017	0.018
9	Copper, g/Kg	0.03	0.03
10	Nickel, g/Kg	0.02	0.04
11	Zinc, g/Kg	0.01	0.06
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	BDL	0.01
14	Chromium, g/Kg	BDL	BDL
15	Manganese, g/Kg	0.02	0.027
16	Cobalt, g/Kg	0.02	0.02
17	Nitrate, g/Kg	BDL	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit



### S10/B- Land of Hetubha Jadeja Near Block Factory, Ler Village

<b>Location</b>	:	Land of Hetubha Jadeja Near Block Factory, Ler Village  Latitude: 23°12'05" N Longitude: 69°45'35" E
<b>Site Photographs:</b>	:	Please refer Photograph of site presented at <b>Figure No 3.21.</b>
<b>Google Image</b>	:	Site location map along with sample location is presented at <b>Figure No. 3.22.</b>
<b>Soil Analysis</b>	:	Soil analysis report is presented at <b>Table No. 3.12.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  Levels of mineral content at Gypsum site is at par with virgin soil quality. Thus, there will not be any detrimental effect on soil quality.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Inspection Report</b>	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



**Figure No. 4.21**  
**Photograph of SiteS10/B-**  
**Land of Hetubha Jadeja Near Block Factory, Ler Village**



**Figure No. 3.22**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S10/B-Land of Hetubha Jadeja Near Block Factory, Ler Village**



**Before Lifting of Gypsum**



**After Lifting of Gypsum**

S10B/10B C	Soil Sample from site
S10/10 B	Virgin Soil Sample near Gypsum site area



**Table No. 3.12**  
**Soil Analysis Report- Site S10/B-**  
**Land of Hetubha Jadeja Near Block Factory, Ler Village**

Sr. No.	Parameters	S10B/10B C Soil Sample from site	S10/10 B Virgin Soil Sample near Gypsum site area
1	Moisture %	4.80	4.90
2	pH	7.99	7.80
3	Conductivity, mS/cm	0.214	0.115
4	Calcium, g/Kg	1.21	1.09
5	Sodium, g/Kg	2.4	1.4
6	Potassium, g/Kg	1.0	0.4
7	Sulphate, g/Kg	0.22	0.12
8	Ammonia, g/Kg	0.018	0.018
9	Copper, g/Kg	0.01	0.03
10	Nickel, g/Kg	0.01	0.04
11	Zinc, g/Kg	0.02	0.06
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.01	0.01
14	Chromium, g/Kg	0.01	BDL
15	Manganese, g/Kg	0.05	0.07
16	Cobalt, g/Kg	0.01	0.02
17	Nitrate, g/Kg	BDL	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit.



**Figure No. 3.23**  
**Photograph of Site S10/C-**  
**Land of Hetubha Jadeja Near Block Factory, Ler Village**



**Figure No. 3.24**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S10/C - Land of Hetubha Jadeja Near Block Factory, Ler Village**



**Before Lifting of Gypsum**



**After Lifting of Gypsum**

S10C/10C C	Soil Sample from site
S10/10 B	Virgin Soil Sample near Gypsum site area



**Table No. 3.13**  
**Soil Analysis Report- Site S10/C -**  
**Land of Hetubha Jadeja Near Block Factory, Ler Village**

Sr. No.	Parameters	S10C/10C C Soil Sample from site	S10/10 B Virgin Soil Sample near Gypsum site area
1	Moisture %	4.76	4.90
2	pH	7.66	7.80
3	Conductivity, mS/cm	0.243	0.115
4	Calcium, g/Kg	1.39	1.09
5	Sodium, g/Kg	1.8	1.4
6	Potassium, g/Kg	0.6	0.4
7	Sulphate, g/Kg	0.16	0.12
8	Ammonia, g/Kg	0.022	0.018
9	Copper, g/Kg	0.03	0.03
10	Nickel, g/Kg	0.05	0.04
11	Zinc, g/Kg	0.06	0.06
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.01	0.01
14	Chromium, g/Kg	0.01	BDL
15	Manganese, g/Kg	0.064	0.063
16	Cobalt, g/Kg	0.02	0.02
17	Nitrate, g/Kg	BDL	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit



## 3.2.11 S11- Land at village Bhujodi

<b>Location</b>	:	Land at village Bhujodi  Latitude: 23°12'43" N Longitude: 69°44'28" E
<b>Site Photographs:</b>	:	Please refer Photograph of site presented at <b>Figure No 3.25.</b>
<b>Google Image</b>	:	Site location map along with sample location is presented at <b>Figure No. 3.26.</b>
<b>Soil Analysis</b>	:	Soil analysis report is presented at <b>Table No. 3.14.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  At Gypsum site, low elevated levels of mineral contents viz. Ca, Na, K and $\text{SO}_4$ were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient, Calcium and Sulphur are secondary major plant nutrients in soil and they are categorized as essential nutrients for plant growth.  Level of Zinc is slightly higher as compared to virgin soil samples. However, Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Inspection Report</b>	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



**Figure No. 3.25**  
**Photograph of Site-S11-**  
**Land at village Bhujodi**



**Figure No. 3.26**  
**Location Map Before and After removal of Gypsum along with Soil Samples for**  
**Site S11- Land at village Bhujodi**



**Table No. 3.14**  
**Soil Analysis Report- Site S11-**  
**Land at village Bhujodi**

Sr. No.	Parameters	S11/11 C Soil Sample from site	S11/11 B Virgin Soil Sample near Gypsum site area
1	Moisture %	5.14	5.20
2	pH	7.50	7.72
3	Conductivity, mS/cm	1.087	3.613
4	Calcium, g/Kg	2.45	1.76
5	Sodium, g/Kg	6.0	1.2
6	Potassium, g/Kg	1.0	BDL
7	Sulphate, g/Kg	0.61	0.34
8	Ammonia, g/Kg	BDL	BDL
9	Copper, g/Kg	0.030	0.027
10	Nickel, g/Kg	0.02	0.02
11	Zinc, g/Kg	0.05	0.04
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.02	0.02
14	Chromium, g/Kg	0.03	0.03
15	Manganese, g/Kg	0.20	0.15
16	Cobalt, g/Kg	0.007	0.010
17	Nitrate, g/Kg	BDL	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit.



## 3.2.12 S12- Near toll gate Lakhond

<b>Location</b>	:	Near toll gate Lakhond  Latitude: 23°15'36" N Longitude: 69°46'48" E
<b>Site Photographs:</b>	:	Please refer Photograph of site presented at <b>Figure No 3.27.</b>
<b>Google Image</b>	:	Site location map along with sample location is presented at <b>Figure No. 3.28.</b>
<b>Soil Analysis</b>	:	Soil analysis report is presented at <b>Table No. 3.15.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  At Gypsum site, low elevated levels of mineral contents viz. Ca, Na, K and $\text{SO}_4$ were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient, Calcium and Sulphur are secondary major plant nutrients in soil and they are categorized as essential nutrients for plant growth.  Level of Nickel is slightly higher as compared to virgin soil samples. However, Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Inspection Report</b>	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



Figure No. 3.27  
Photograph of Site-S12-  
Near toll gate lakhond



**Figure No. 3.28**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S12- Near toll gate lakhond**



**Before Lifting of Gypsum**



**After Lifting of Gypsum**

S12/12 C	Soil Sample from site
S12/12 B	Virgin Soil Sample near Gypsum site area



**Table No. 3.15**  
**Soil Analysis Report- Site S12- Near toll gate Lakhond**

Sr. No.	Parameters	S12/12 C Soil Sample from site	S12/12 B Virgin Soil Sample near Gypsum site area
1	Moisture %	4.23	3.94
2	pH	7.63	7.56
3	Conductivity, mS/cm	0.970	0.716
4	Calcium, g/Kg	2.81	1.76
5	Sodium, g/Kg	4.4	4.0
6	Potassium, g/Kg	1.2	0.8
7	Sulphate, g/Kg	0.57	0.40
8	Ammonia, g/Kg	0.022	0.019
9	Copper, g/Kg	0.02	0.02
10	Nickel, g/Kg	0.03	0.02
11	Zinc, g/Kg	0.04	0.04
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.01	BDL
14	Chromium, g/Kg	BDL	BDL
15	Manganese, g/Kg	0.18	0.16
16	Cobalt, g/Kg	0.01	0.01
17	Nitrate, g/Kg	BDL	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit.



## 3.2.13 S13- Vavdi Village, Opp. Of Survey No. 85/1

<b>Location</b>	:	Vavdi Village, Opp. of Survey No. 85/1  Latitude: 23°11'31" N Longitude: 69°49'45" E
<b>Site Photographs:</b>	:	Please refer Photograph of site presented at <b>Figure No 3.29.</b>
<b>Google Image</b>	:	Site location map along with sample location is presented at <b>Figure No. 3.30.</b>
<b>Soil Analysis</b>	:	Soil analysis report is presented at <b>Table No. 3.16.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  At Gypsum site, low elevated levels of mineral contents viz. Na, K and $\text{SO}_4$ were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient, Calcium and Sulphur are secondary major plant nutrients in soil and they are categorized as essential nutrients for plant growth.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Inspection Report</b>	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



**Figure No. 3.29**  
**Photograph of Site-S13-**  
**Vavdi Village, Opp. Of Survey No. 85/1**



**Figure No. 3.30**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S13- Vavdi Village, Opp. Of Survey No. 85/1**



**Before Lifting of Gypsum**



**After Lifting of Gypsum**

S13/13 C	Soil Sample from site
S9/9 B and S13/13 B	Common Virgin Soil Sample near Gypsum site area



**Table No. 3.16**  
**Soil Analysis Report Site S13-**  
**Vavdi Village, Opp. Of Survey No. 85/1**

Sr. No.	Parameters	S13/13 C Soil Sample from site	S9/9 B and S13/13B Common Virgin Soil Sample near Gypsum site area
1	Moisture %	5.60	5.42
2	pH	7.50	7.52
3	Conductivity, mS/cm	0.732	0.209
4	Calcium, g/Kg	1.12	0.96
5	Sodium, g/Kg	3.2	1.2
6	Potassium, g/Kg	1.8	BDL
7	Sulphate, g/Kg	0.22	0.16
8	Ammonia, g/Kg	BDL	BDL
9	Copper, g/Kg	0.01	0.01
10	Nickel, g/Kg	0.01	0.01
11	Zinc, g/Kg	0.02	0.02
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.01	0.01
14	Chromium, g/Kg	BDL	BDL
15	Manganese, g/Kg	0.06	0.05
16	Cobalt, g/Kg	0.01	0.01
17	Nitrate, g/Kg	BDL	0.01
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit.



### 3.2.14 S14- Beside Lehriya Hanuman Temple, Kukma village

<b>Location</b>	:	Beside Lehriya Hanuman Temple, Kukma village  Latitude: 23°13'24" N Longitude: 69°46'19" E
<b>Site Photographs:</b>	:	Please refer Photograph of site presented at <b>Figure No 3.31.</b>
<b>Google Image</b>	:	Site location map along with sample location is presented at <b>Figure No. 3.32.</b>
<b>Soil Analysis</b>	:	Soil analysis report is presented at <b>Table No. 3.17.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  At Gypsum site, low elevated levels of mineral contents viz. Ca, Na, K and $\text{SO}_4$ were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient, Calcium and Sulphur are secondary major plant nutrients in soil and they are categorized as essential nutrients for plant growth.  Level of Nickel is slightly higher as compared to virgin soil samples. However, Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Inspection Report</b>	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



**Figure No. 3.31**  
**Photograph of Site S14-**  
**Beside Lehriya Hanuman Temple, Kukma village**



**Figure No. 3.32**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S14- Beside Lehriya Hanuman Temple, Kukma village**



**Before Lifting of Gypsum**



**After Lifting of Gypsum**

S14/14C	Soil Sample from site
S8/8 B	Virgin Soil Sample near Gypsum site area



**Table No. 3.17**  
**Soil Analysis Report- Site S14-**  
**Beside Lehriya Hanuman Temple, Kukma village**

Sr. No.	Parameters	S14/14 C Soil Sample from site	S8/8 B Virgin Soil Sample near Gypsum site area
1	Moisture %	3.78	3.28
2	pH	7.56	8.82
3	Conductivity, mS/cm	1.064	0.305
4	Calcium, g/Kg	8.09	6.89
5	Sodium, g/Kg	15.0	4.4
6	Potassium, g/Kg	2.6	1.0
7	Sulphate, g/Kg	1.05	0.32
8	Ammonia, g/Kg	BDL	0.017
9	Copper, g/Kg	0.02	0.02
10	Nickel, g/Kg	0.029	0.020
11	Zinc, g/Kg	0.024	0.020
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.01	0.01
14	Chromium, g/Kg	BDL	0.05
15	Manganese, g/Kg	0.10	0.12
16	Cobalt, g/Kg	0.007	0.007
17	Nitrate, g/Kg	BDL	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit.



## 3.2.15 S15- At Dargah, Village Lakhond

<b>Location</b>	:	At Dargah, Village Lakhond Latitude: 23°15'31" N Longitude: 69°46'55" E
<b>Site Photographs:</b>	:	Please refer Photograph of site presented at <b>Figure No 3.33.</b>
<b>Google Image</b>	:	Site location map along with sample location is presented at <b>Figure No. 3.34.</b>
<b>Soil Analysis</b>	:	<p>Soil analysis report is presented at <b>Table No. 3.18.</b></p> <p>The soil analysis in above table indicates that, Gypsum as <math>\text{CaSO}_4 \cdot 2\text{H}_2\text{O}</math> is not present in soil sample. Thus, Gypsum has been removed from the site.</p> <p>At Gypsum site, low elevated levels of mineral contents viz. Ca, Na, K and <math>\text{SO}_4</math> were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient, Calcium and Sulphur are secondary major plant nutrients in soil and they are categorized as essential nutrients for plant growth.</p> <p>Level of Nickel is slightly higher as compared to virgin soil samples. However, Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.</p>
<b>Inspection Report</b>	:	The analysis report of soil indicates that there is no adverse impact due to Gypsum on soil. However, higher levels of conductivity and cations (Inorganic Nutrients) are observed at Gypsum Site as compared to the blank site. Which is good for the growth of plants as higher the conductivity, higher will be the amount of nutrients present for plant growth.

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



Figure No. 3.33  
Photograph of Site-S15-  
At Dargah, Village Lakhond



**Figure No. 3.34**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S15- At Dargah, Village Lakhond**



**Before Lifting of Gypsum**



**After Lifting of Gypsum**

S15/15 C	Soil Sample from site
S15/15 B	Virgin Soil Sample near Gypsum site area



**Table No. 3.18**  
**Soil Analysis Report Site S15- At Dargah, Village Lakhond**

Sr. No.	Parameters	S15/15 C Soil Sample from site	S15/15 B Virgin Soil Sample near Gypsum site area
1	Moisture %	4.20	4.48
2	pH	7.50	7.38
3	Conductivity, mS/cm	2.463	1.328
4	Calcium, g/Kg	6.09	3.69
5	Sodium, g/Kg	7.2	1.2
6	Potassium, g/Kg	2.8	0.2
7	Sulphate, g/Kg	2.43	1.09
8	Ammonia, g/Kg	0.017	0.012
9	Copper, g/Kg	0.02	0.02
10	Nickel, g/Kg	0.03	0.02
11	Zinc, g/Kg	0.024	0.023
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.02	0.02
14	Chromium, g/Kg	0.02	0.03
15	Manganese, g/Kg	0.10	0.09
16	Cobalt, g/Kg	0.01	0.01
17	Nitrate, g/Kg	BDL	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit.



## 3.2.16 S16/A- At Village Lakhond

<b>Location</b>	:	At Village Lakhond  Latitude: 23°15'39" N Longitude: 69°46'44" E
<b>Site Photographs:</b>	:	Please refer Photograph of site presented at <b>Figure No 3.35.</b>
<b>Google Image</b>	:	Site location map along with sample location is presented at <b>Figure No. 3.36.</b>
<b>Soil Analysis</b>	:	Soil analysis report is presented at <b>Table No. 3.19.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  At Gypsum site, low elevated levels of mineral contents viz. Ca, Na, K and $\text{SO}_4$ were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient, Calcium and Sulphur are secondary major plant nutrients in soil and they are categorized as essential nutrients for plant growth.  Level of Nickel is slightly higher as compared to virgin soil samples. However, Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Inspection Report</b>	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



Figure No. 3.35  
Photograph of Site S16/A-  
At Village Lakhond



**Figure No. 3.36**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S16/A- At Village Lakhond**



**Before Lifting of Gypsum**



**After Lifting of Gypsum**

S16/16 C	Soil Sample from site
S15/15 B	Virgin Soil Sample near Gypsum site area



**Table No. 3.19**  
**Soil Analysis Report Site S16/A- At Village Lakhond**

Sr. No.	Parameters	S16/16 C Soil Sample from site	S15/15 B Virgin Soil Sample near Gypsum site area
1	Moisture %	4.64	4.48
2	pH	7.70	7.38
3	Conductivity, mS/cm	2.896	1.328
4	Calcium, g/Kg	4.97	3.69
5	Sodium, g/Kg	5.6	1.2
6	Potassium, g/Kg	0.8	0.2
7	Sulphate, g/Kg	1.73	1.09
8	Ammonia, g/Kg	0.013	0.012
9	Copper, g/Kg	0.022	0.020
10	Nickel, g/Kg	0.033	0.020
11	Zinc, g/Kg	0.020	0.023
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.011	0.020
14	Chromium, g/Kg	0.026	0.030
15	Manganese, g/Kg	0.080	0.090
16	Cobalt, g/Kg	0.012	0.010
17	Nitrate, g/Kg	0.02	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit.



## S16/B- At Village Lakhond

<b>Location</b>	:	At Village Lakhond  Latitude: 23°15'36" N Longitude: 69°46'48" E
<b>Site Photographs:</b>	:	Please refer Photograph of site presented at <b>Figure No 3.37.</b>
<b>Google Image</b>	:	Site location map along with sample location is presented at <b>Figure No. 3.38.</b>
<b>Soil Analysis</b>	:	Soil analysis report is presented at <b>Table No. 3.20.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  At Gypsum site, low elevated levels of mineral contents viz. Ca, Na, K and $\text{SO}_4$ were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient, Calcium and Sulphur are secondary major plant nutrients in soil and they are categorized as essential nutrients for plant growth.  Level of Nickel is slightly higher as compared to virgin soil samples. However, Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Inspection Report</b>	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



Figure No. 3.37  
Photograph of Site-S16/B-  
At Village Lakhond



**Figure No. 3.38**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S16/B- At Village Lakhond**



**Before Lifting of Gypsum**



**After Lifting of Gypsum**

S16/16 C	Soil Sample from site
S15/15 B	Virgin Soil Sample near Gypsum site area



**Table No. 3.20**  
**Soil Analysis Report- Site S16/B- At Village Lakhond**

Sr. No.	Parameters	S16/16 C Soil Sample from site	S15/15 B Virgin Soil Sample near Gypsum site area
1	Moisture %	4.64	4.48
2	pH	7.7	7.38
3	Conductivity, mS/cm	2.896	1.328
4	Calcium, g/Kg	4.97	3.69
5	Sodium, g/Kg	5.6	1.2
6	Potassium, g/Kg	0.8	0.2
7	Sulphate, g/Kg	1.73	1.09
8	Ammonia, g/Kg	0.013	0.012
9	Copper, g/Kg	0.022	0.02
10	Nickel, g/Kg	0.033	0.02
11	Zinc, g/Kg	0.02	0.023
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.011	0.02
14	Chromium, g/Kg	0.026	0.03
15	Manganese, g/Kg	0.08	0.09
16	Cobalt, g/Kg	0.012	0.01
17	Nitrate, g/Kg	0.02	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit.



### 3.2.17 S17- Behind Ashapura Foundation School, Ashapura Colony, Bhachau Road, Kukma

<b>Location</b>	:	Behind Ashapura Foundation school, Ashapura Colony, Bhachau Road, Kukma  Latitude: 23°14'07" N Longitude: 69°46'26" E
<b>Site Photographs:</b>	:	Please refer Photograph of site presented at <b>Figure No 3.39.</b>
<b>Google Image</b>	:	Site location map along with sample location is presented at <b>Figure No. 3.40.</b>
<b>Soil Analysis</b>	:	Soil analysis report is presented at <b>Table No. 3.21.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  At Gypsum site, low elevated levels of mineral contents viz. Ca, Na, K and $\text{SO}_4$ were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient, Calcium and Sulphur are secondary major plant nutrients in soil and they are categorized as essential nutrients for plant growth.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Inspection Report</b>	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



**Figure No. 3.39**  
**Photograph of Site-S17-**  
**Behind Ashapura Foundation school, Ashapura Colony, Bhachau Road,**  
**Kukma**



**Figure No. 3.40**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S17- B/h. Ashapura Foundation school, Ashapura Colony, Bhachau Road,**  
**Kukma**



**Before Lifting of Gypsum**



**After Lifting of Gypsum**

S17/17 C	Soil Sample from site
S17/17 B	Virgin Soil Sample near Gypsum site area



**Table No. 3.21**  
**Soil Analysis Report Site S17-**  
**Behind Ashapura Foundation school, Ashapura Colony, Bhachau Road,**  
**Kukma**

Sr. No.	Parameters	S17/17 C Soil Sample from site	S17/17 B Virgin Soil Sample near Gypsum site area
1	Moisture %	4.10	4.24
2	pH	7.90	7.90
3	Conductivity, mS/cm	1.088	0.684
4	Calcium, g/Kg	3.65	2.08
5	Sodium, g/Kg	5.6	4.4
6	Potassium, g/Kg	3.0	1.6
7	Sulphate, g/Kg	0.87	0.23
8	Ammonia, g/Kg	BDL	BDL
9	Copper, g/Kg	0.01	0.01
10	Nickel, g/Kg	0.019	0.020
11	Zinc, g/Kg	0.032	0.036
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.012	0.010
14	Chromium, g/Kg	0.014	0.012
15	Manganese, g/Kg	0.091	0.060
16	Cobalt, g/Kg	0.01	0.01
17	Nitrate, g/Kg	BDL	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit.



## 3.2.18 S18- Farm on Lakhond Road

Location	:	Farm on Lakhond Road  Latitude: 23°14'49" N Longitude: 69°46'52" E
Site Photographs	:	Please refer Photograph of site presented at <b>Figure No 3.41</b>
Google Image	:	Site location map along with sample location is presented at <b>Figure No. 3.42.</b>
Soil Analysis	:	<p>Soil analysis report is presented at <b>Table No. 3.22.</b></p> <p>The soil analysis in above table indicates that, Gypsum as <math>\text{CaSO}_4 \cdot 2\text{H}_2\text{O}</math> is not present in soil sample. Thus, Gypsum has been removed from the site.</p> <p>At Gypsum site, low elevated levels of mineral contents viz. Ca, Na, K and <math>\text{SO}_4</math> were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient, Calcium and Sulphur are secondary major plant nutrients in soil and they are categorized as essential nutrients for plant growth.</p> <p>Levels of Copper and Nickel are slightly higher as compared to virgin soil samples. However, Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.</p>
Inspection Report	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

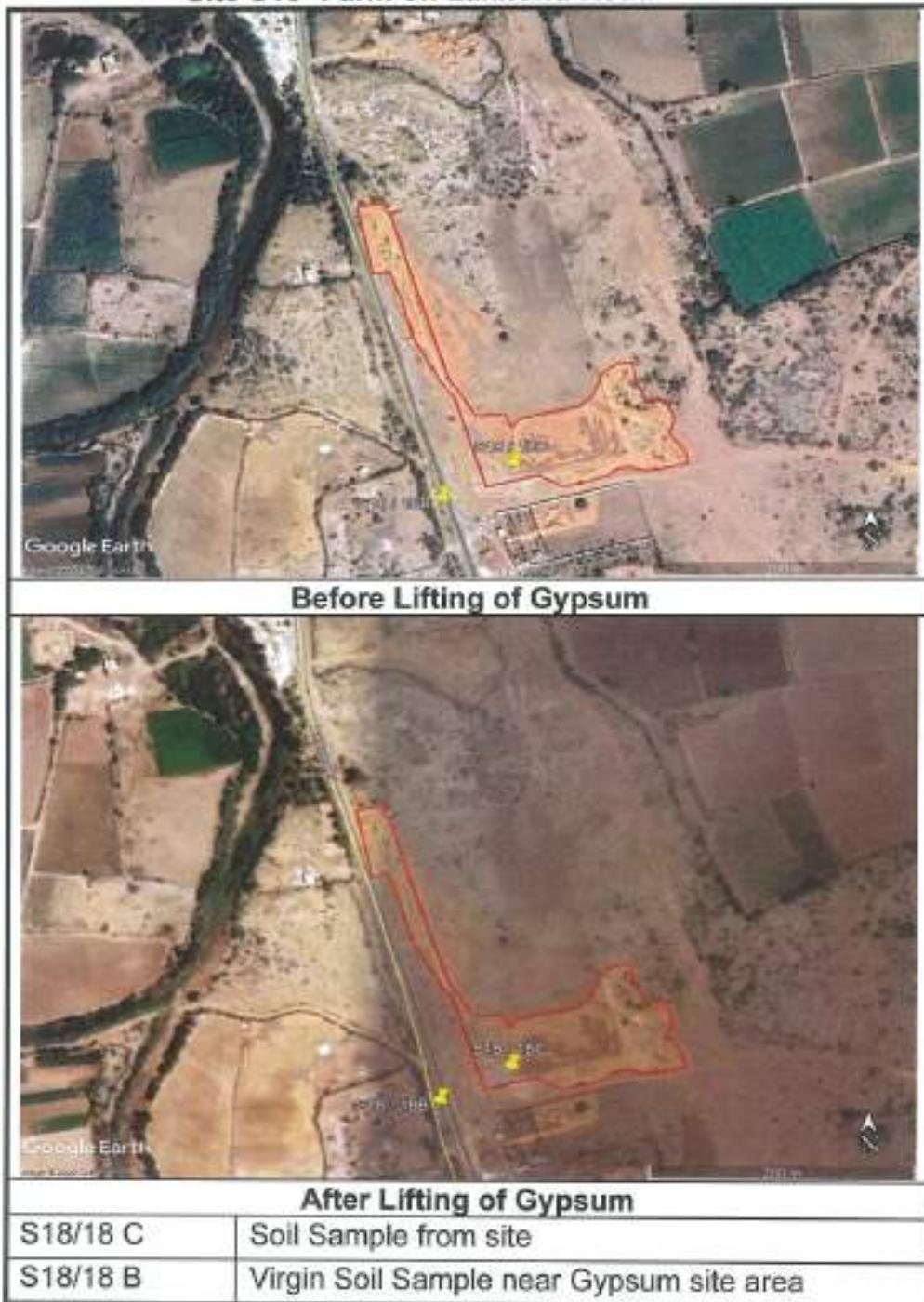
**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



Figure No. 3.41  
Photograph of Site-S18-  
Farm on Lakhond Road



**Figure No. 3.42**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S18- Farm on Lakhond Road**



**Table No. 3.22**  
**Soil Analysis Report Site S18- Farm on Lakhond Road**

Sr. No.	Parameters	S18/18 C Soil Sample from site	S18/18 B Virgin Soil Sample near Gypsum site area
1	Moisture %	3.88	4.10
2	pH	7.38	7.75
3	Conductivity, mS/cm	1.042	0.209
4	Calcium, g/Kg	2.65	1.13
5	Sodium, g/Kg	6.4	2.0
6	Potassium, g/Kg	3.0	0.4
7	Sulphate, g/Kg	1.16	0.21
8	Ammonia, g/Kg	0.017	0.010
9	Copper, g/Kg	0.024	0.018
10	Nickel, g/Kg	0.035	0.022
11	Zinc, g/Kg	0.020	0.024
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.01	0.01
14	Chromium, g/Kg	BDL	BDL
15	Manganese, g/Kg	0.011	0.010
16	Cobalt, g/Kg	0.013	0.010
17	Nitrate, g/Kg	BDL	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit.



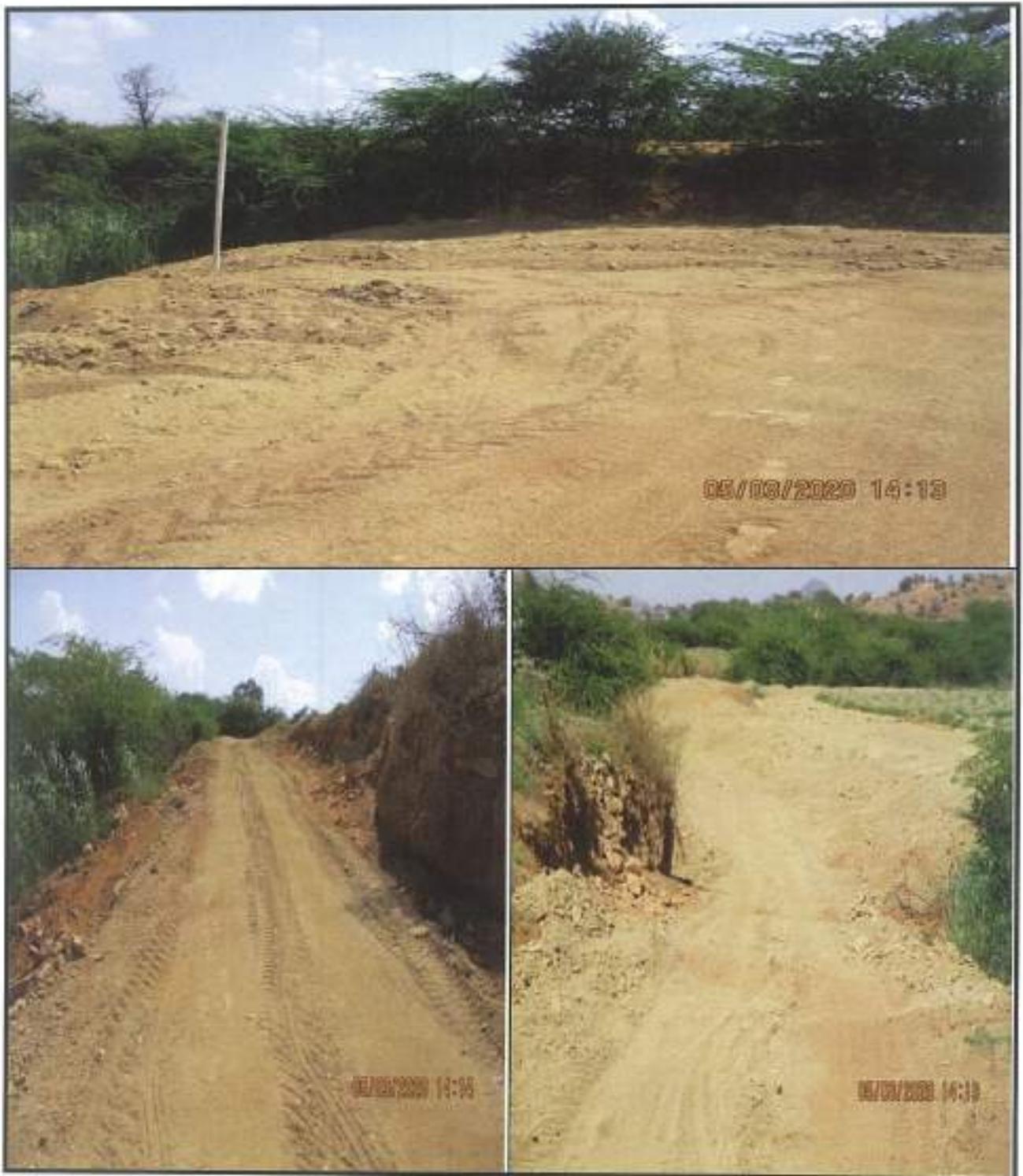
## 4.4.19 S19- Besides Balubha Rathod's Lake Ler Village

<b>Location</b>	:	Besides Balubha Rathod's Lake Ler Village  Latitude: 23°11'47" N Longitude: 69°46'17" E
<b>Site Photographs:</b>	:	Please refer Photograph of site presented at <b>Figure No 3.43.</b>
<b>Google Image</b>	:	Site location map along with sample location is presented at <b>Figure No. 3.44.</b>
<b>Soil Analysis</b>	:	Soil analysis report is presented at <b>Table No. 3.23.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  At Gypsum site, low elevated levels of mineral contents viz. Ca, Na, K and $\text{SO}_4$ were observed compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient, Calcium and Sulphur are secondary major plant nutrients in soil and they are categorized as essential nutrients for plant growth.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Inspection Report</b>	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



Figure No. 3.43  
Photograph of Site-S19-  
Besides Balubha Rathod's Lake Ler Village



**Figure No. 3.44**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S19- Besides Balubha Rathod's Lake Ler Village**



**Before Lifting of Gypsum**



**After Lifting of Gypsum**

S19/19 C	Soil Sample from site
S19/19 B	Virgin Soil Sample near Gypsum site area



**Table No. 3.23**  
**Soil Analysis Report of Site S19- Besides Balubha Rathod's Lake Ler Village**

Sr. No.	Parameters	S19/19 C Soil Sample from site	S19/19 B Virgin Soil Sample near Gypsum site area
1	Moisture %	4.87	4.74
2	pH	7.00	7.18
3	Conductivity, mS/cm	1.588	1.060
4	Calcium, g/Kg	6.89	5.13
5	Sodium, g/Kg	5.2	4.6
6	Potassium, g/Kg	1.6	1.0
7	Sulphate, g/Kg	2.50	1.01
8	Ammonia, g/Kg	0.012	0.011
9	Copper, g/Kg	0.021	0.020
10	Nickel, g/Kg	0.021	0.019
11	Zinc, g/Kg	0.046	0.044
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.01	0.01
14	Chromium, g/Kg	0.021	0.03
15	Manganese, g/Kg	0.060	0.019
16	Cobalt, g/Kg	0.01	0.01
17	Nitrate, g/Kg	0.01	0.01
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit.



## 3.2.20 S20A- At Shekhpur Parle

<b>Location</b>	:	At Shekhpur Parle  Latitude: 23°13'40" N Longitude: 69°45'33" E
<b>Site Photographs:</b>	:	Please refer Photograph of site presented at <b>Figure No 3.45.</b>
<b>Google Image</b>	:	Site location map along with sample location is presented at <b>Figure No. 3.46.</b>
<b>Soil Analysis</b>	:	Soil analysis report is presented at <b>Table No. 3.24.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  The virgin sample was not available at site to comparative analysis of site soil quality is not ascertain.  Comparing the soil sample with Screening and Responsive Level as specified by MoEF(*), it indicates that levels in site sample are below screening levels.
<b>Inspection Report</b>	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site

**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



Figure No. 3.45  
Photograph of Site S20/A  
At Shekhpur Parle



**Figure No. 3.46**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S20/A- At Shekhpur Parle**



**Before Lifting of Gypsum**



**After Lifting of Gypsum**

S20A/20A C	Soil Sample from site
S20B/20B C	Soil Sample from site



**Table No. 3.24**  
**Soil Analysis Report of Site S20/A- At Shekpir Parle**

Sr. No.	Parameters	S20A/20A C Soil Sample from site
1	Moisture %	4.78
2	pH	7.60
3	Conductivity, mS/cm	0.689
4	Calcium, g/Kg	1.92
5	Sodium, g/Kg	5.8
6	Potassium, g/Kg	1.0
7	Sulphate, g/Kg	0.44
8	Ammonia, g/Kg	0.022
9	Copper, g/Kg	0.009
10	Nickel, g/Kg	0.011
11	Zinc, g/Kg	0.120
12	Cadmium, g/Kg	BDL
13	Lead, g/Kg	0.011
14	Chromium, g/Kg	0.013
15	Manganese, g/Kg	0.064
16	Cobalt, g/Kg	0.009
17	Nitrate, g/Kg	BDL
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL

BDL : Below Detectable Limit.



## S20/B- At shekhpur parle

<b>Location</b>	:	At Shekhpur Parle  Latitude: 23°13'33" N Longitude: 69°45'28" E
<b>Site Photographs:</b>	:	Please refer Photograph of site presented at <b>Figure No 3.47.</b>
<b>Google Image</b>	:	Site location map along with sample location is presented at <b>Figure No. 3.48.</b>
<b>Soil Analysis</b>	:	Soil analysis report is presented at <b>Table No. 3.25.</b>  The soil analysis in above table indicates that, Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is not present in soil sample. Thus, Gypsum has been removed from the site.  The virgin sample was not available at site to comparative analysis of site soil quality is not ascertain.  Comparing the soil sample with Screening and Responsive Level as specified by MoEF(*), it indicates that levels in site sample are below screening levels.
<b>Inspection Report</b>	:	Based on our visual observations and soil analysis report it is inferred that Gypsum has been lifted from the said site.

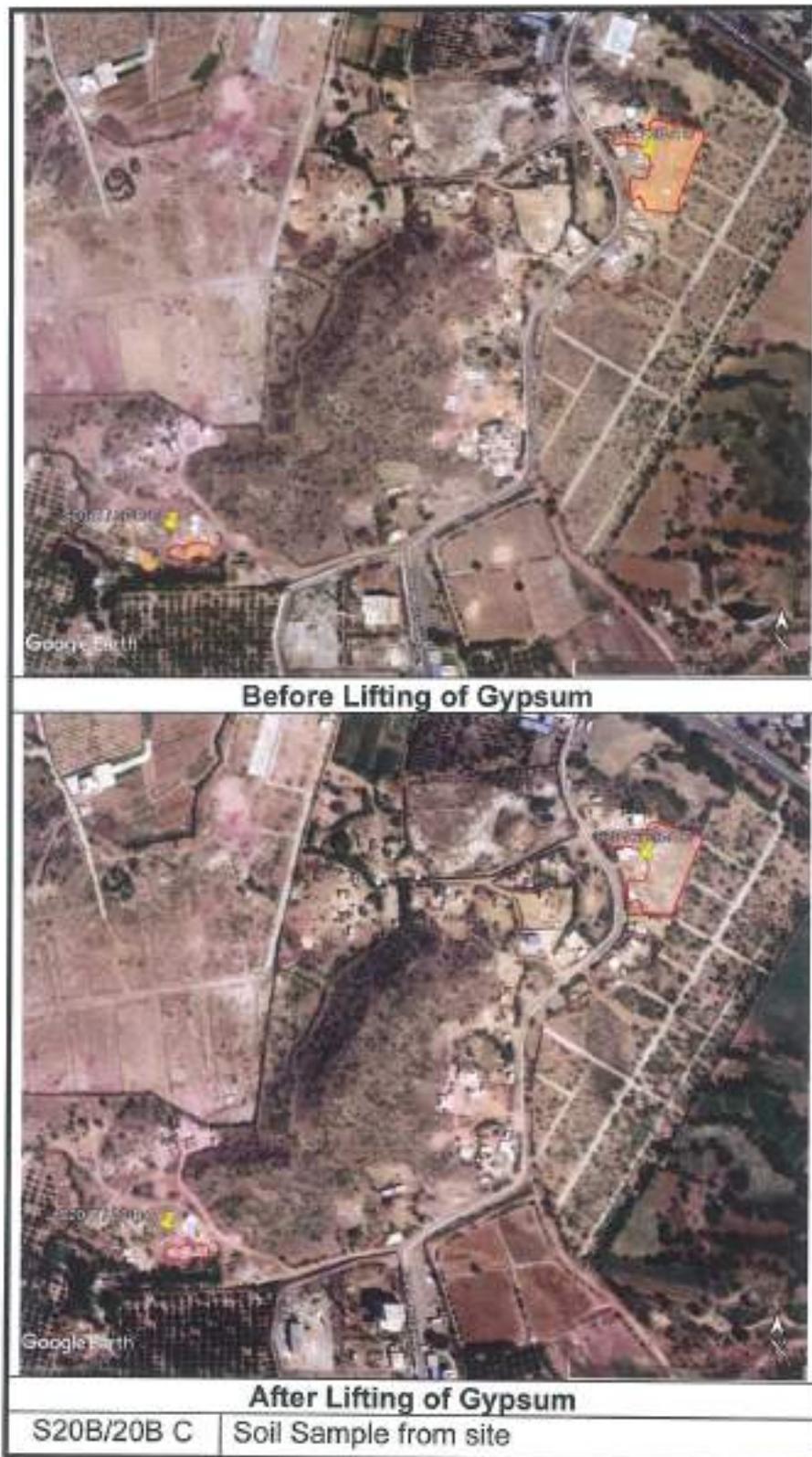
**Note:** (\*) Copy of Screening and Responsive Level as specified by MoEF is attached as an **Annexure-3.2.**



Figure No. 3.47  
Photograph of Site S20/B-  
At Shekhpur Parle



**Figure No. 3.48**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S20/B- At Shekhpur Parle**



**Table No. 3.25**  
**Soil Analysis Report Site of S20/B- At Shekhpur Parle**

Sr. No.	Parameters	S20B/20B C Soil Sample from site
1	Moisture %	5.64
2	pH	7.16
3	Conductivity, mS/cm	0.474
4	Calcium, g/Kg	0.96
5	Sodium, g/Kg	2.4
6	Potassium, g/Kg	1.0
7	Sulphate, g/Kg	0.25
8	Ammonia, g/Kg	BDL
9	Copper, g/Kg	0.012
10	Nickel, g/Kg	0.085
11	Zinc, g/Kg	0.066
12	Cadmium, g/Kg	BDL
13	Lead, g/Kg	0.018
14	Chromium, g/Kg	0.012
15	Manganese, g/Kg	0.083
16	Cobalt, g/Kg	0.022
17	Nitrate, g/Kg	0.01
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL

BDL : Below Detectable Limit.





Figure No. 3.49  
Photograph of Site S21-  
Kali Talavadi Road, Village Lakhond



**Figure No. 3.50**  
**Location Map Before and After Lifted of Gypsum along with Soil Samples for**  
**Site S21- Kali Talavadi Road, Village Lakhond**



**Before Lifting of Gypsum**



**After Lifting of Gypsum**

S21/21 C	Soil Sample from site
S21/21 B	Virgin Soil Sample near Gypsum site area



**Table No. 3.26**  
**Soil Analysis Report Site S21- Kali Talavadi Road, Village Lakhond**

Sr. No.	Parameters	S21/21 C Soil Sample from site	S21/21 B Virgin Soil Sample near Gypsum site area
1	Moisture %	5.92	6.84
2	pH	7.52	8.08
3	Conductivity, mS/cm	1.985	0.313
4	Calcium, g/Kg	4.81	2.01
5	Sodium, g/Kg	14.4	10.2
6	Potassium, g/Kg	6.0	3.6
7	Sulphate, g/Kg	1.24	0.24
8	Ammonia, g/Kg	BDL	BDL
9	Copper, g/Kg	0.022	0.020
10	Nickel, g/Kg	0.013	0.012
11	Zinc, g/Kg	0.04	0.04
12	Cadmium, g/Kg	BDL	BDL
13	Lead, g/Kg	0.012	0.010
14	Chromium, g/Kg	BDL	BDL
15	Manganese, g/Kg	0.019	0.021
16	Cobalt, g/Kg	0.008	0.010
17	Nitrate, g/Kg	0.01	0.01
18	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	BDL

BDL : Below Detectable Limit.



## 4.0 CONCLUSION

OUTCOME OF THE STUDY REPORT IS PRESENTED HEREUNDER:

### SOIL QUALITY ASSESSMENT:

1. Gypsum as  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$  is not present in any of the soil samples which indicates that, Gypsum has been lifted from all the 21 sites.
2. The Mineral content in soils, i.e. major primary and secondary plant nutrients viz. Calcium, Sodium, Potassium, Manganese and Sulphate ranges from 0.28 to 8.09 g/kg, 0.40 to 20.8 g/kg, 0.00 to 8.60 g/kg, 0.005 to 0.362 g/kg and 0.12 to 2.50 g/kg respectively. These values are well above the critical values required for the plant growth as per "Method Manual, Soil Testing in India, Department of Agriculture & Cooperation, Ministry of Agriculture, GOI. It may be noted that there exist no upper limit of these plant nutrients in soil.
3. The low elevated levels of primary and secondary major plant nutrients viz. Sodium, Potassium, Calcium and Sulfate were observed at all the sites in soil samples compared to virgin soil samples. This could be due to mixing of Gypsum with the native soils. This will not have any detrimental effect on soil quality. It may be noted that, Potassium is a major group-II primary nutrient, Calcium and Sulphur are secondary major plant nutrients in soil and they are categorized as essential nutrients for plant growth.
4. The pH values in soil ranges from 7.00 to 8.82, indicating neutral to alkaline soils.
5. The micro nutrient content viz. Zinc, Copper and Cobalt ranges from 0.01 to 0.12 g/kg, 0.000 to 0.039 g/kg and 0.000 to 0.022 g/kg respectively. These values are well below the screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines" Guidance document for assessment and remediation of contaminates sites in India, 2015".
6. The metal content in the soil viz. Cadmium, Chromium, Nickel and Lead ranges from 0.00 to 0.001, 0.000 to 0.101 g/kg, 0.000 to 0.085 g/kg and 0.000 to 0.020 g/kg respectively. These values are well below the screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines" Guidance document for assessment and remediation of contaminates sites in India, 2015".

### CONCLUSION:

Recapitulating all the gathered information and our soil analysis report it is concluded that Gypsum has been lifted from all the 21 sites and no detrimental effect is observed in soil quality of said 21 sites.

-----End-----



# ANNEXURE



# ANNEXURE 1.1

## Copy of CC&A Order



### GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN  
Sector-10-A, Gandhinagar 382 010  
Phone : (079) 23222425  
(079) 23232152  
Fax : (079) 23232156  
Website : www.gpcb.gov.in

By R.P.A.D.

In exercise of the power conferred under section-25 of the Water (Prevention and Control of Pollution) Act-1974, under section-21 of the Air (Prevention and Control of Pollution)-1986 and Authorization under rule 6(2) of the Hazardous & Other Waste (Management & Transboundary Movement) Rules 2016, framed under the Environmental (Protection) Act-1986. The board has granted the consent vide order no. PC/CCA-KUTCH-27(7)/GPCB ID-17774/406201, date: 04/03/2017.

And whereas Board has received application inward No. 198381 dated 16/04/2018 for the Renewal Consolidated Consent and Authorization (CC&A) of this Board under the provisions / rules of the aforesaid Acts. Consents & Authorization are hereby granted as under:

#### CONSENTS AND AUTHORISATION:

(Under the provisions /rules of the aforesaid environmental acts)

To  
Ashapura Perfoclay Ltd,  
Survey No. 157,  
Vill: Ler, Nr. Bhujodi,  
Anjar Bhuj Highway,  
Tal: Bhuj,  
Dist: Kutch.

1. Consent Order No. AWH-93521 Date of issue: 11/06/2018.
2. The consent shall be valid up to 24/06/2023 for manufacture of the following products:

Sr. No.	Product	Quantity per Month
1.	Bleaching Clay	12,000 MT

#### SUBJECT TO THE FOLLOWING SPECIFIC CONDITIONS

1. You shall comply with all conditions of Environment Clearance issued vide letter no. SEIAA/GUJ/EC/2(p)/497/2016, dated 30/07/2016.
2. No ground water shall be withdrawn without obtaining prior permission from competent authority.
3. You shall operate Effluent Treatment Plant regularly and efficiently.
4. The gypsum generated from neutralizing spent acid shall be disposed in environmentally sound manner.



3. **CONDITIONS UNDER WATER ACT 1974:**

- 3.1 The source of water shall be GWL (Gujarat Water Infrastructure Ltd.).
- 3.2 The total industrial and domestic water consumption shall not exceed 838 KL/day.
- 3.3 The quantity of industrial effluent from manufacturing process and other ancillary operations shall not exceed 550 KL/day.
- 3.4 The quantity of the domestic waste water (Gewege) shall not exceed 6 KL/day.
- 3.5 The quality of the industrial effluent shall conform to the following standards:

PARAMETER	PERMISSIBLE LIMIT
pH	6.5 to 8.5
Temperature	40°C
Colour (Pt. Co. scale units)	100 units
Suspended Solids	100 mg/L
Oil & Grease	10 mg/L
Phenolic Compound	0.1 mg/L
Ammonical Nitrogen	50 mg/L
BOD (3 Days at 27°C)	30 mg/L
COD	100 mg/L
Chlorides	600 mg/L
Sulphates	1000 mg/L
Total Dissolved Solids	2100 mg/L
Sodium Absorption Ratio	28
Percent Sodium	80 %
Sulphides	02 mg/L
Total Chromium	02 mg/L
Hexavalent Chromium	0.1 mg/L
Copper	03 mg/L
Lead	0.1 mg/L
Mercury	0.01 mg/L
Nickel	03 mg/L
Zinc	05 mg/L
Cadmium	02 mg/L
Cyanides	0.2 mg/L
Arsenic	0.2 mg/L
Fluorides	02 mg/L

All efforts shall be made to remove colour & unpleasant odour as far as practicable.

- 3.6 The treated effluent @ 180 KL/day conforming to standards mentioned in 3.5 shall be used in gardening and plantation within premises.
- 3.7 The treated effluent @ 150 KL/day shall be reused in the process.





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- 3.8 The R.O. reject @ 220 KL/day shall be send to solar evaporation pond.
- 3.9 The applicant shall develop green belt area scientifically to utilize 180 KLD after achieving norms as mentioned in condition no. 3.5.
- 3.10 The pipeline network shall be proper and adequate for utilization of treated wastewater for gardening and plantation. Also adequate storage and handling of treated wastewater shall be developed.
- 3.11 Regular maintenance of pipes and pumps shall be done, such that there shall be no chock up in lines or failures of pumps.
- 3.12 The distribution of flow shall be maintained for plantation in such a way that there shall not be any ponding.
- 3.13 Records of plantation and growth rate shall be maintained and submitted to Regional Office, Kutch (West) and Head Office, Gandhinagar. Skilled person / in charge shall be nominated for specialty this activity.
- 3.14 Sewage shall be disposed off through septic tank / soak pit system.

#### 4. CONDITIONS UNDER AIR ACT 1981:

- 4.1 The following shall be used as fuel in proposed Steam Boiler/D. G Set and Dryer as following rates:

Sr. No.	Fuel	Quantity
1.	Coal	16 MT/day
2.	Furnace Oil	0.6 MT/day
3.	High Speed Diesel	120 Liter/Hour

- 4.2 The applicant shall install & operate air pollution control system in order to achieve flue gas emission norms as prescribed below.

Sr. no.	Stack attached to	Stack height in Meters	APCM	Parameter	Permissible limit
1.	Boiler -1 & 2 (3 MT/hr-each)	33	Multi Cyclone followed by Bag Filter	PM SO <sub>2</sub> NO <sub>x</sub>	150 mg/Nm <sup>3</sup> 100 ppm 50 ppm
2.	Boiler-3 (3 MT/hr)	33	Multi Cyclone followed by Bag Filter		
3.	Boiler-4 (3 MT/hr)	33	Multi Cyclone followed by Bag Filter		
4.	D.G. Set (500 KVA)	11	Adequate Stack Height		
5.	D.G. Set (250 KVA) stand by	11	Adequate Stack Height		

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Sr. No.	Stack attached to	Stack height in Meters	APCM	Parameter	Permissible limit
12	Dryer - 4 Stand by	18	Cyclone Separator and water Scrubber		
13	Dryer - 5	18	Cyclone Separator and water Scrubber		
14	Dryer - 6	18	Cyclone Separator and water Scrubber		
15	Dryer - 7	18	Cyclone Separator and water Scrubber		
16	Hot Air Generator attached with dryer -5	20	Cyclone Separator		

- 4.4 The concentration of the following parameters in the ambient air within the premises of the industry shall not exceed the limits specified hereunder as per National Ambient Air Quality Standards issued by MoEF&CC dated 16th November-2009.

Sr. No.	Pollutant	Time Weighted Average	Concentration in Ambient air in $\mu\text{g}/\text{m}^3$
1	Sulphur Dioxide ( $\text{SO}_2$ )	Annual	50
		24 Hours	80
2	Nitrogen Dioxide ( $\text{NO}_2$ )	Annual	40
		24 Hours	80
3	Particulate Matter (Size less than $10 \mu\text{m}$ ) OR $\text{PM}_{10}$	Annual	60
		24 Hours	100
4	Particulate Matter (Size less than $2.5 \mu\text{m}$ ) OR $\text{PM}_{2.5}$	Annual	40
		24 Hours	60

- 4.5 The applicant shall provide portholes, ladder, platform etc. at chimney(s) for monitoring the air emissions and the same shall be open for inspection. The chimney(s) vents attached to various sources of emission shall be designed by numbers such as S-1, S-2, etc. and these shall be painted / displayed to facilitate identification.
- 4.8 The concentration of Noise in ambient air within the premises of industrial unit shall not exceed following levels:

Between 8 A.M. to 10 P.M.: 75 dB (A)  
Between 10 P.M. to 8 A.M.: 70 dB (A)

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5. Authorization under Hazardous & Other Waste (Management & Transboundary Movement) Rules, 2016 & amended.

5.1 Authorization Number- AWH - 93521 and shall valid up to 24/08/2023.

5.2 Ashapura Perfocey Ltd, is hereby granted an authorization to operate facility for following hazardous wastes after expansion on the premises situated at, Survey No. 167, VII- Lar, Nr. Bhujodi, Anjar Bhuj Highway, Bhuj, Dist - Kutch.

Sr. No.	Waste	Quantity per Year	Category	Mode of Disposal
1.	ETP Sludge	0.22 MT	35.3	Collection, storage, Transportation & disposal at TSDF
2.	Sludge From Wet Scrubbers	8.50 MT	37.1	Collection, storage, Transportation and send to Sanghi Industry for co-processing.
3.	Used Oil	100 Litre	5.1	Collection, storage, Transportation & Disposal by selling out to authorized recyclers.
4.	Spent Acid	66000 MT	B15-II	Collection, storage, neutralize within factory premises and generated gypsum shall be send to cement industry for co-processing
5.	Evaporation Residue	1.0 MT	37.3	Collection, storage, Transportation & disposal at TSDF

5.3 The disposal mode for spent acid as per EC condition the spent acid shall be neutralize within factory premises and generated gypsum shall be send to cement industry for co-processing.

5.4 The authorization is granted to operate a facility for collection, storage, within factory premises, transportation, and ultimate disposal of Hazardous wastes by selling out to authorized recyclers and disposal at TSDF.

5.5 The authorization is subject to the conditions stated below and such other conditions as may be specified in the rules from time to time under the Environment (Protection) Act-1986.

**5.6 TERMS AND CONDITIONS OF AUTHORISATION:**

1. The authorized person shall comply with the provisions of the Environment (Protection) Act, 1986, and the rules made there under.
2. The authorization or its renewal shall be produced for inspection at the request of an officer authorized by the State Pollution Control Board.
3. The person authorized shall not rent, lend, sell, transfer or otherwise transport the hazardous and other wastes except what is permitted through this authorization.
4. Any unauthorized change in personnel, equipment or working conditions as mentioned in the application by the person authorized shall constitute a breach of his authorization.





## GUJARAT POLLUTION CONTROL BOARD

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Website : [www.gpcb.gov.in](http://www.gpcb.gov.in)

5. The person authorized shall implement Emergency Response Procedure (ERP) for which this authorization is being granted considering all site specific possible scenarios such as spillages, leakages, fire etc. and their possible impacts and also carry out mock drill in this regard at regular interval of time.
6. The person authorized shall comply with the provisions outlined in the Central Pollution Control Board guidelines on "Implementing Liabilities for Environmental Damages due to Handling and Disposal of Hazardous Waste and Penalty".
7. It is the duty of the authorized person to take prior permission of the State Pollution Control Board to close down the facility.
8. The imported hazardous and other wastes shall be fully insured for transit as well as for any accidental occurrence and its clean-up operation.
9. The record of consumption and fate of the imported hazardous and other wastes shall be maintained.
10. The hazardous and other waste which gets generated during recycling or reuse or recovery of pre-processing or utilization of imported hazardous or other wastes shall be treated and disposed of as per specific conditions of authorization.
11. The importer or exporter shall bear the cost of import or export and mitigation of damages if any.
12. An application for the renewal of an authorization shall be made as laid down under these Rules.
13. Any other conditions for compliance as per the Guidelines issued by the Ministry of Environment, Forest and Climate Change or Central Pollution Control Board from time to time.
14. Annual return shall be filed by June 30th for the period ensuing 31st March of the year.

### 6. GENERAL CONDITIONS: -

- 6.1 Unit shall develop green belt within premises as per the CPCB guidelines. However, if the adequate land is not available within premises, the unit shall tie up with local agencies like gram panchayat, school, social forestry office etc. for the plantation at suitable open land in nearby locality and submit an action plan of plantation for next three years to GPCB.
- 6.2 Adequate plantation shall be carried out all along the periphery of the industrial premises in such a way that the density of plantation is at least 1000 trees per acre of land and a green belt of 10 meters width is developed.
- 6.3 The applicant shall have to submit the returns in prescribed form regarding water consumption and shall have to make payment of water cess to the Board under the Water (Prevention and Control of Pollution) Cess Act- 1977.
- 6.4 In case of change of ownership/management, the name and address of the new owners/partners/directors/proprietor should immediately be intimated to the Board.

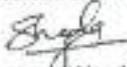
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- 6.5 The applicant shall however, not without the prior consent of the Board bring into use any new or altered outlet for the discharge of effluent or gaseous emission or sewage waste from the proposed industrial plant. The applicant is required to make applications to this Board for this purpose in the prescribed forms under the provisions of the Water (Prevention and Control of Pollution) Act-1974, the Air (Prevention and Control of Pollution) Act-1981 and the Environment (Protection) Act-1986.
- 6.6 The overall noise level in and around the plant area shall be kept well within the standards by providing noise control measures including engineering control like acoustic insulation hoods, silencers, enclosures etc on all sources of noise generation. The ambient noise level shall conform to the standards prescribed under the Environment (Protection) Act, 1986 & Rules.
- 6.7 Applicant is required to comply with the manufacturing, Storage and Import of Hazardous Chemicals Rules-1989 framed under the Environment (Protection) Act-1986.
- 6.8 If it is established by any competent authority that the damage is caused due to their industrial activities to any person or his property in that case they are obliged to pay the compensation as determined by the competent authority.
- 6.9 Applicant shall have to comply with all the guidelines / Directive issued / being issued by MoEF&CC / CPCB / DoEF from time to time.
- 6.10 Applicant shall not use/withdraw ground water either during construction and /or operation phase.
- 6.11 Environmental cell shall be setup and shall be responsible for the total Environmental management.
- 6.12 Monitoring in respect to Air, Water, Noise level shall be carried out and results shall be submitted to GPCB on quarterly basis.

For and on behalf of  
GUJARAT POLLUTION CONTROL BOARD

  
(Sushil Vegda)  
Senior Environment Engineer

NO: PC/CCA-KUTCH-27(7)GPCB ID - 17774/

Date:

ISSUED TO:  
Ashapura Perfoclay Ltd,  
Survey No. 167,  
Vill: Lor, Nr. Bhujodi,  
Anjar Bhuj Highway,  
Tal Bhuj, Dist. Kutch.

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## CC&A Amendment Order



### GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN  
Sector-10-A, Gandhinagar 382 010  
Phone : (079) 23222425  
(079) 23232152  
Fax : (079) 23232156  
Website : www.gpcb.gov.in

By R.P.A.D.

#### AMENDMENT TO CONSENTS AND AUTHORISATION

To  
M/s. Ashapura Perfoclay Ltd.,  
Survey No. 167, 163 & 164  
Vill. Ler. Nr. Bhujodi,  
Anjar Bhuj Highway,  
Tal: Bhuj,  
Dist: Kutch

Subject : Amendment to Consolidated Consent and Authorisation (CC&A)  
Reference : 1) CCA order no AWH-93521 vide letter no PC/CCA-KUTCH-  
27(7)/GPCB ID 1777446919C date 20/09/2018  
2) Your CCA Amendment Application Inward ID No. 181357 dated  
15/07/2019.

Sir

In exercise of the power conferred under section-27 of the Water (Prevention and Control of Pollution) Act-1974 under section-21 of the Air (Prevention and Control of Pollution)-1981 and Authorization under rule 8(2) of the Hazardous & Other Waste (Management & Transboundary Movement) Rules-2016 & as amended framed under the Environmental (Protection) Act-1986 and without reducing your responsibility under the said Acts/Rules in anyway this Board is empowered to amend consent order condition. Accordingly the Consolidated Consent and Authorisation (CC&A) issued vide letter no. PC/CCA-KUTCH - 27(7)/GPCB ID 1777446919C, dated 20/09/2018 which is valid up to 24/06/2023 under reference (1) stands amended in respect of the following conditions.

1. Consent Order No.: H-163222, Date of Issue, 29/07/2019.
2. The consent order shall be valid up to 24/06/2023.
3. There shall be no change in production capacity, water consumption, waste water generation, fuel consumption and hazardous waste generation due to proposed amendment.
4. This CCA Amendment is granted only for the alternate mode of disposal of gypsum waste generated from neutralization of spent acid, to mines back filling in the abandoned mines only when cement industries are not in operation and / or not accepting the gypsum for co-processing with following specific conditions:

#### SUBJECT TO THE FOLLOWING SPECIFIC CONDITIONS:

1. Unit shall comply with the conditions of the Environment Clearance granted by the competent authority.

Page 1 of 3

**Clean Gujarat Green Gujarat**  
ISO 9001:2008 & ISO 14001 : 2004 Certified Organisation



2. Unit shall approach other cement industries for sending gypsum waste for co-processing.
3. Unit shall submit the data when the cement industry is not accepting the gypsum for co-processing along with the document from the same industry.
4. The gypsum waste generated from neutralization of dilute spent acid by using fresh hydrated lime only be disposed at mines back filling to the abandoned mines of Mrs. Ashapura Minocem Ltd. (Mata no Madh exhausted Montonite mines) (Cat. no. 3643) located at survey no. 189 Travasa palki, Ta. Lakhot, Dist. Kutch having Latitude Longitude as N 23° 30' 09.3" E 69° 56' 34.6".
5. The filtered cake of gypsum shall be stored at the dedicated storage area having proper lining and leachate collection system such that there is no seepage.
6. Unit shall analyse the generated gypsum at regular interval of the process and shall submit the analysis report of the same to this office and to the regional office Kutch (West).
7. Unit shall provide impervious liner with adequate thickness after leakage test in the mines before disposing the gypsum waste.
8. Unit shall provide impervious liner system possessing adequate physical, chemical and mechanical properties to prevent failure due physical contact with gypsum or leachate or climatic condition or hydrostatic uplift pressure and stresses which may arise due to stacking of the gypsum.
9. All the joints of the liner prior to commencement shall be tested for leakages.
10. Unit shall provide dedicated transportation facility.
11. The vehicles use for the transportation of the gypsum waste shall be registered under Motor Vehicle Act - 1960 and dedicated only for collection and transportation of gypsum waste.
12. The vehicles used for transportation shall be covered properly with tarpaulin sheets.
13. In no case there shall be spillage of the gypsum while handling and transportation of the gypsum. In case of any spillage of gypsum waste while transporting, it shall be sole responsibility of unit for cleaning such spillages.
14. Unit shall take adequate steps to control fugitive emission while handling and transportation of gypsum.
15. Unit shall monitor the ground water quality at regular interval at the mines where gypsum waste is to be back filled i.e. Mrs. Ashapura Minocem, Lakhot, Kutch and submit the analysis report to this office.

2





## GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN

Sector-10-A, Gandhinagar 382 010

Phone : (079) 23222425

(079) 23232152

Fax : (079) 23232156

Website : www.gpcb.gov.in

16. In no case the ground water shall be affected due to back filling of the gypsum in the mines.
  17. Unit shall maintain the record of the generation and disposal of gypsum. Unit shall submit monthly data of the same to this office and regional office, Kutch (West).
  18. Unit shall prepare contingency plan and suitable remedial measures shall be taken to have no impact on environment.
  19. In no case gypsum shall be dumped outside the designated area.
  20. Unit shall be held responsible if illegal dumping of the gypsum waste is observed at any other places.
  21. Unit shall comply with the closure mining plan.
  22. Unit shall carry out Ambient Air Quality Monitoring near the industry and also at the mines.
  23. Unit shall increase the green belt area i.e. tree area within and at periphery of the premises.
  24. Unit shall also develop green belt area at abandoned mines where gypsum waste to be backfilled.
  25. Unit shall be responsible for the final closure of the mines and shall cover with the top soil and plantation.
5. The other terms and condition of CCA order no. AMH-93521 vide letter no. PC/CCA-KUTCH - 27(7)/GPCB ID 17774/468190, date 20/09/2018 shall remain unchanged.

For and on behalf of  
GUJARAT POLLUTION CONTROL BOARD

(Smt. U. K. Upadhyay)  
Environment Engineer

NO: PC/CCA-KUTCH-27(16)/GPCB ID - 17774/ Date:

ISSUED TO:  
Ashapura Perfoclay Ltd,  
Survey No. 167, 163 & 164  
Villi Ler, Nr. Bhujodi,  
Anjar Bhuj Highway,  
Tal: Bhuj,  
Dist: Kutch

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**Clean Gujarat Green Gujarat**  
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**ANNEXURE 1.2**  
**COPY OF RECOGNIZED SCHEDULE-I ENVIRONMENT**  
**AUDITOR OF GPCB**



**GUJARAT POLLUTION CONTROL BOARD**  
**Paryavaran Bhavan**  
Sector - 10 A, Gandhinagar - 382 010.  
Environment Audit Cell

No. GPCB/EA-115(1)/ 53-1877

22 JAN 2020 RPAD

To,  
**M/s. Gujarat Industrial and Technical Consultancy Organization Limited (GITCO)**  
"GITCO House" Opp. Sardar Patel Stadium,  
Stadium Road, Navrangpura,  
Ahmedabad - 380 009

**Sub:-** Amendment in Recognition as Schedule-I Environmental Auditor.  
**Ref:-** GPCB/EA-115(1)/493335 dated 01/02/2019

Sir,

This refers to your application for the recognition as Environmental Auditor, subsequent interview and visit of your Laboratory by Environment Audit Committee members. It is recommended by the Environment Audit Committee members, to recognize your firm as Schedule-I Environmental Auditor for carrying out the Environmental Audit under Environment Audit Scheme with following conditions.

- 1) Recognition is valid upto **31/12/2020**.
- 2) You shall have maximum **One** team for the Environment Audit.
- 3) You shall carry out maximum **15** nos. of Environment Audit.
- 4) Team members shall be as under :

Sr. No.	Name	Designation
1	Mrs. Mehjabin Shaikh	Environment Engineer
2	Mr. Nirav Shah	Chemical Engineer
3	Ms. Bhavesh Shah	Chemist
4	Ms. Zalak Khambhata	Microbiologist

- 5) You shall prepared and submit the Environment Audit report and to comply the conditions for Environment Auditors as per the Hon'ble High Court order dated 20/12/1996, 13/03/1997, 16/09/1999, and also the Guidelines prepared by Gujarat Pollution Control Board in this regard, for the Environment Audit Scheme along with the Adequacy and Efficacy certificates as per prescribed format.
- 6) Environment Audit Report shall be submitted in prescribed format.

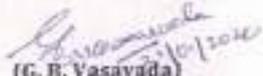
**Clean Gujarat Green Gujarat**  
**An ISO 9001: 2008 & ISO 14001: 2004 Certified Organization**



- 7) You shall apply for renewal of Environmental Auditor 3 months before expiry of the recognition with the scrutiny fees to this Board.
- 8) This recognition is subject to periodic evaluation of your facility and subject to change based on performance.
- 9) In case of change in man power, team member or any other suggestion, recommendation or any issue, you shall appear before the Environment Audit Committee.

This letter is issued with the permission of competent authority.

For and on behalf of GPCB,

  
(G. B. Vasavada)  
Scientific Officer  
21/01/2020



## **GUJARAT INDUSTRIAL AND TECHNICAL CONSULTANCY ORGANISATION LIMITED (GITCO)**

GITCO – a premier Technical Consultancy Organisation (TCO) - provides consulting services to accelerate the growth of industrial and services economy of Gujarat. For the last 40 years, with committed hard work, the GITCO Professional Team has won the trust of Ministries and Departments of the Government, Multi-lateral Agencies, Financial Institutions, Industry Associations and the ubiquitous Gujarati businessmen.

- "GITCO" a multidisciplinary consultancy organization.
- A board spectrum of Project management, Financial, Industrial, Technical, and Environmental consultancy services under one roof.
- Unique combination of institutional support, direct interaction with the private sector and professionalism.
- "GITCO" an organization offering high quality and reliable consultancy services in fast changing economic & business scenario.

The inherent Gujarati insight and business acumen along with professional inputs enable us to give innovative perspectives in our consulting assignments. Currently, we offer our services for generic as well as niche areas aimed to ensure balanced growth and development.

The organization's most important resource is its manpower. It has a strong team of 36 dedicated employees of which 20 are highly qualified and experienced technical / management / finance specialists. GITCO team of professionals is in a position to meet Consultancy needs of diverse industry disciplines: Engineering / Chemical / Plastic / Pharmaceutical / Environment / Textile / Information Technology / Food and Agro-processing etc. The company has, to support its in-house professional manpower, a panel of over 50 external experts specializing in core technical and managerial areas.

GITCO has well developed independent Environment Consultancy Cell with professional manpower and well-equipped laboratory.

### **Services Provided by Environment Management Cell of GITCO: -**

GITCO in the field of environment is capable of handling multifarious assignments like Regional Carrying Capacity Assessment, Environmental Impact Assessment Study, Site Assessment Study, Contamination Study, Environmental Audit and various assignment related with pollution control activities. With its exclusive and professional manpower, which being the backbone, it has successfully delivered various assignments for reputed private as well as Government Institute across the country.

GITCO offers expertise laboratory services to clients in all the environmental & analytical modules for regulatory Compliances. GITCO operates its own NABL accredited laboratory. The Analytical Laboratory offers a comprehensive



line of testing & sampling with its key focus being Accurate, Meticulous & Reproducible results. With covering relevant physical and chemical parameters for analysis of pollutants in air, water, wastewater, sludge and soil. GITCO also carries out treatability studies for water and wastewater.

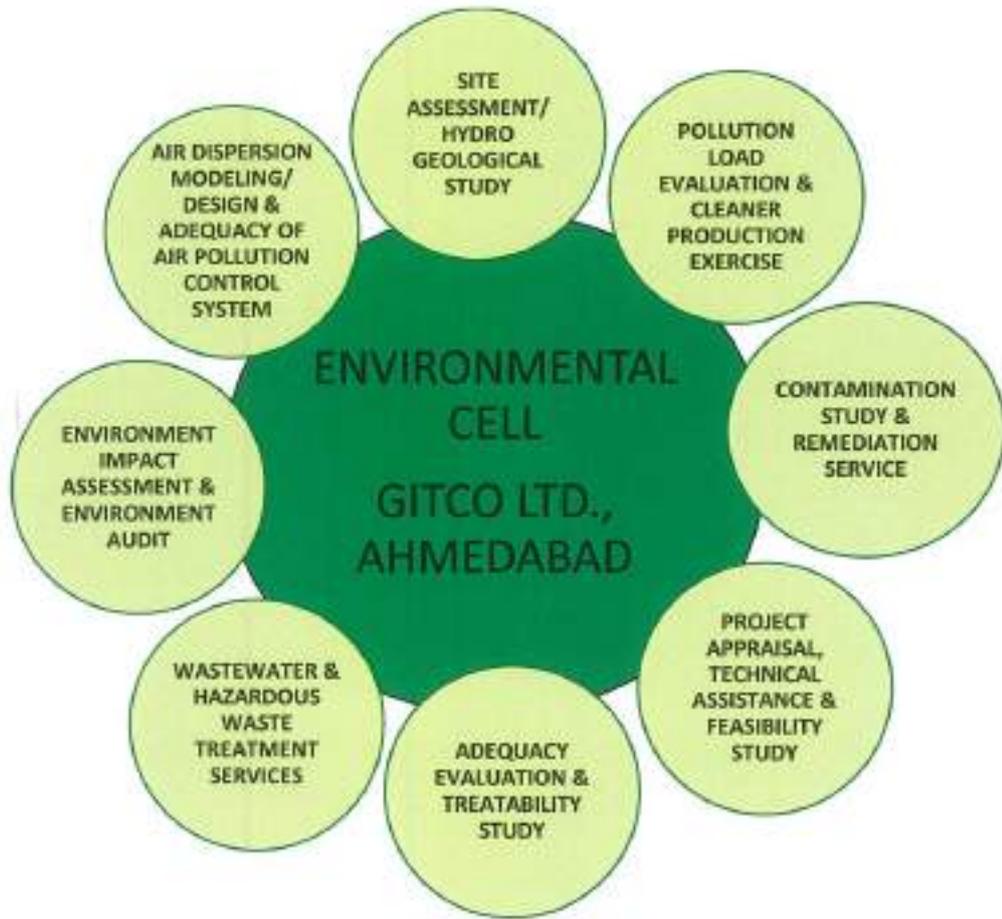
GITCO is a Schedule-I Environmental Auditor of Gujarat Pollution Control Board and also Ministry of Environment and Forest approved authorized consultant for project appraisal of common environmental facilities.

Clientele include Public Sector Enterprises, Private Industries, Multinationals, Ministry of Environment and Forest, State Pollution Control Boards across several prestigious projects. Several Fortune 500 clients regularly work with GITCO Ltd.

### **The services offered by Environmental cell is as follows:**

1. Environment Impact Assessment Study
2. Environment audit as per environment audit scheme promulgated by honourable high court of Gujarat & GPCB (GITCO is recognized auditor for schedule-I & II industries)
3. Regional Carrying Capacity Assessment
4. Adequacy Evaluation of Environmental management system
5. Treatability Study
6. Hydro Geomorphological study
7. Site Assessment and Contamination Study
8. Project appraisal, Feasibility study, Technical assessment.
9. Third Party Inspection Study
10. Pollution Load Evaluation and Cleaner Production Exercise
11. Laboratory services
12. Waste water treatment services
13. Hazardous waste treatment services
14. Air Dispersion Modelling
15. Evaluation of boiler efficiency and design adequacy of air pollution control system.





❖ **GITCO has worked on many projects on Contamination Study and site assessment:**

- Contamination Study
- Soil and groundwater investigations
- Hydrogeological Study
- Hazardous Waste landfills
- Third Party Inspection and Monitoring

**The list of projects completed by GITCO under Contaminated Study and Site Assessment are hereunder:**

1

Name of project	: Assessment of soil contamination & remedial measures for M/s. Virat Alloys (P) Ltd., Kadi-Kalol road, Gujarat
Year	: 2020
Project features	: <ul style="list-style-type: none"> <li>• Secondary data collection (i.e. Pickling process details &amp; source of sludge)</li> <li>• Site visit &amp; Pickling sludge sample collection</li> <li>• Analysis of Pickling Sludge</li> <li>• Soil quality analysis after removal of sludge from site</li> <li>• Review &amp; Interpretation of results</li> <li>• Observation &amp; Conclusion</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>M/s. Virat Alloys (P) Ltd. is a SS Rolling Mill and generates Pickling Sludge from Effluent Treatment Plant. The unit had disposed the said sludge illegally through tractor in to open plot &amp; As per closure order, the unit has to carryout remediation of contaminated soil by recollecting and disposing hazardous waste at active authorized TSDF site. GITCO was assigned the work of assuring the completion of Remediation. Prior to sample collection, the pit area where sludge was disposed, was visually inspected to assess the absence of any other waste and non-representative material. Sample of Pickling sludge from plant &amp; Soil samples from contaminated site were collected and level of contamination were assessed. The unit was directed to lift the sludge as well as contaminated soil where sludge was dumped.</p>	



Name of project	:	Assessment & remedial measures of contamination to Eradicate/control of Contamination, Swastik Organic, Himmatnagar, Gujarat
Year	:	2019
Project features	:	<ul style="list-style-type: none"> <li>• Geo hydrological &amp; Hydro Geological condition assessment</li> <li>• Assessment of condition of existing wells</li> <li>• Ground water sample collection in &amp; around the existing tube wells</li> <li>• Pump test to know the characteristics of aquifer</li> <li>• Indication of extent of contamination</li> <li>• Suggestion of Remedial measures</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>The unit was engaged in the manufacturing of different Dyes intermediates from 1982-2004. During this period the unit had duped Iron Sludge on open land near the factory premises. Over these many years the same has contaminated the below surface land and ground water. Contamination of Groundwater, land and surface water due to dumping of the is Iron Sludge was carried out. During this study GITCO has done Soil and Geo Hydrological survey &amp; investigation studies in and around the contaminated plant site of Swastik Organics. The base line data was collected, compiled, analyzed and interpreted to assess the present status of soil and ground water conditions and identifying probable reasons for distribution of pollutant in underground soil and water environment, if any. As per the investigation studies and findings remedial measures were suggested.</p>		



Name of project	: Geo-Hydrological study related to the ground water, land and surface water contamination for M/s. N R Agrawal, Vapi, Gujarat
Year	: 2018
Project features	: <ul style="list-style-type: none"> <li>• Geo hydrological &amp; Hydro Geological condition assessment</li> <li>• Assessment of condition of existing wells</li> <li>• Ground water sample collection in &amp; around the existing tube wells</li> <li>• Pump test to know the characteristics of aquifer</li> <li>• Indication of extent of contamination</li> <li>• Suggestion of Remedial measures</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>The company is having Writing, Printing and News Print Paper manufacturing unit at Sarigam. The unit is manufacturing the same from recycled waste paper. It is generating sludge from de-inking process of paper manufacturing. It is generating sludge from de-inking process of paper manufacturing. sludge was found lying in open area within the factory premises by statutory authority. Contamination of Groundwater, land and surface water due to dumping De-inking Sludge was carried out. During this study GITCO has done Soil and Geo Hydrological survey &amp; investigation studies in and around the contaminated plant site. The base line data was collected, compiled, analyzed and interpreted to assess the present status of soil and ground water conditions and identifying probable reasons for distribution of pollutant in underground soil and water environment, if any. As per the investigation studies and findings remedial measures were suggested.</p>	



Name of project	:	Geo-hydrological study of underground water contamination in & around the premises for M/s. Ashapura Perfoclay Ltd., Bhuj, Gujarat
Year	:	2018
Project features	:	<ul style="list-style-type: none"> <li>• Preliminary site visit</li> <li>• Collection of relevant data around the plant area</li> <li>• Sampling &amp; Testing in &amp; around the identified sites to assess the possible effects on Ground water &amp; Soil</li> <li>• Screening, review and comparison of results</li> <li>• Conclusion</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>M/s. Ashapura Perfoclay Ltd. Is involved in the manufacturing of Bleaching Clay. Gypsum is generated from neutralization of this spent sulfuric acid with lime procured from fertilizer company. High concentration of Ammonical nitrogen was found in surrounding bore wells. In this study GITCO has carried out Soil and Geo Hydrological survey &amp; investigation studies in and around the plant site area. The base line data had been collected, compiled, analyzed and interpreted to assess the present status of soil and ground water conditions and identifying probable reasons for distribution of pollutant in underground soil and water environment.</p>		



<b>Name of project</b>	:	<b>An Opinion Regarding Quarry Disposal of Deinking Sludge for M/s. N R Agrawal, Sarigam, Gujarat</b>
<b>Year</b>	:	2019
<b>Project features</b>	:	<ul style="list-style-type: none"> <li>• Secondary data collection (i.e. Manufacturing process, Source of Deinking Sludge &amp; current practice of sludge disposal)</li> <li>• Site visit &amp; Deinking Sludge Sample collection</li> <li>• Analysis of Deinking sludge</li> <li>• Screening, Review &amp; comparison of results</li> <li>• Opinion &amp; Conclusion regarding Quarry disposal of sludge</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>The Deinking Sludge generated from M/s. NR Agrawal Industries Ltd. Was being disposed off by landfilling. A Study was conducted by GITCO Ltd., to determine the characteristics of de-inking sludge and assess its possibilities for safe quarry disposal. GITCO team has visited the site, collected the sample and scrutinized various data related to production and generation, storage and disposal of deinking sludge. Analysis of deinking sludge was done for physico-chemical, AOX and TLCP test for listed metals in schedule-II of Hazardous Waste Management and Handling Rules, 2016(Schedule II). By screening, reviewing the results &amp; studying legal status for disposal of Deinking sludge GITCO gave opinion regarding Quarry disposal of the same.</p>		



Name of project	:	Third Party Inspection for Gujarat Maritime Board (GMB) for operation & maintenance of TSDF site at Alang Ship yard done by M/s. Gujarat Enviro Protection Infrastructure Limited (GEPIL), Surat.
Year	:	2019
Project features	:	<ul style="list-style-type: none"> <li>• Design Adequacy evaluation</li> <li>• Stage wise monitoring of all the existing components</li> <li>• Sampling and Analysis of piezometric bore-well near Landfill site.</li> <li>• Monitoring the ambient air quality for 24 hrs.</li> <li>• Mass balance or to find efficiency of the incinerator in terms of combustion % and fuel effect.</li> <li>• Recommendations for service/repair/replacement of any component</li> <li>• Prepare/ vet/ update Standard Operating Procedure of ETP</li> <li>• Inspection of firefighting system</li> <li>• Inspection of lab for sufficient facilities</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>Gujarat Maritime Board (GMB) is operating TSDF at Alang Shipyard. GMB awarded the work of operation &amp; maintenance of the said TSDF to M/s. Gujarat Enviro Protection Infrastructure Limited (GEPIL), Surat. GMB has awarded the work for Third Party Inspection (TPI) for the said project to GITCO Ltd. GITCO had already carried out TPI of Design &amp; Construction of the said TSDF facility. Checklist of documents/details required particularly related to operations was prepared and field visit was carried out after receiving the said documents. Monitoring &amp; sampling was carried out to assess the site as per the documents provided. Recommendations for improvements were given to GEPIL. After implementation of suggestions, another field visit was conducted &amp; onsite observations were made. Based on the assessment of documents, field observations &amp; analysis results, a complete report was prepared &amp; submitted to GMB.</p>		

Name of project	:	An Opinion Regarding Quarry Disposal of Deinking Sludge for M/s. Shah Paper Mills Ltd.- Unit 3, Vapi, Gujarat
Year	:	2019
Project features	:	<ul style="list-style-type: none"> <li>• Secondary data collection (i.e. Manufacturing process, Source of Deinking Sludge &amp; current practice of sludge disposal)</li> </ul>



	<ul style="list-style-type: none"> <li>• Site visit &amp; Deinking Sludge Sample collection</li> <li>• Analysis of Deinking sludge</li> <li>• Screening, Review &amp; comparison of results</li> <li>• Opinion &amp; Conclusion regarding Quarry disposal of sludge</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>The Deinking Sludge generated from M/s. Shah Paper Mills Ltd. Was being disposed off by landfilling. A Study was conducted by GITCO Ltd., to determine the characteristics of de-inking sludge and assess its possibilities for safe quarry disposal. GITCO team has visited the site, collected the sample and scrutinized various data related to production and generation, storage and disposal of deinking sludge. Analysis of deinking sludge was done for physico-chemical, AOX and TLCP test for listed metals in schedule-II of Hazardous Waste Management and Handling Rules, 2016(Schedule II). By screening, reviewing the results &amp; studying legal status for disposal of Deinking sludge GITCO gave opinion regarding Quarry disposal of the same.</p>	

8

<b>Name of project</b>	:	<b>Geo-hydrological study of underground contamination in &amp; around the premises of M/s. Troikaa Pharmaceutical Limited, Thol, Gujarat</b>
<b>Year</b>	:	2013
<b>Project features</b>	:	<ul style="list-style-type: none"> <li>• Preliminary site visit</li> <li>• Collection of relevant data around the plant area</li> <li>• Assessment of soil at surface and at the depth of 10 m</li> <li>• Collection &amp; Testing of water samples from existing tubewells</li> <li>• Analysis of variation in water quality of upper/ deeper aquifer</li> <li>• Conclusion</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>M/s. Troikaa Pharmaceuticals Ltd. Is involved in the Pharmaceuticals formulation. GPCB directed the unit to carryout detailed study of underground contamination as their discharge of untreated wastewater was into underground well. The base line data was collected, compiled, analyzed and interpreted to assess the present status of soil and ground water conditions and identifying probable reasons for distribution of pollutant in underground soil and water environment. GITCO has carried out Soil and Geo Hydrological survey &amp; investigation in and around the plant site area to assess the soil condition at surface and at certain depths. Water samples were collected from existing tube wells to analyze status of water quality of upper/ deeper aquifers. Conclusion was prepared incorporating the extent of soil &amp; groundwater contamination.</p>		



Name of project	:	Third Party Inspection for Gujarat Maritime Board (GMB) for construction of Landfill cells and bilge water treatment plant at Alang Ship yard done by M/s. Gujarat Enviro Protection Infrastructure Limited (GEPIL), Surat.
Year	:	2011
Project features	:	<ul style="list-style-type: none"> <li>• Scrutiny &amp; vetting the design &amp; supervision over construction of landfill cells</li> <li>• Scrutiny &amp; vetting the Design and testing &amp; supervision over Supply and installation of incinerator</li> <li>• Scrutiny &amp; vetting Design and testing &amp; supervision over Construction of Bilge water treatment</li> <li>• Scrutiny &amp; vetting Design and testing &amp; supervision over installation and Construction over firefighting system</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>Gujarat Maritime Board (GMB) is operating TSDF at Alang Shipyard. GMB intended the upgradation of the TSDF sites which includes construction of Landfill site having one lakh cubic meter capacity, Incinerator having 5 MT per day capacity along with Fire Frightening system and construction of Leachate and Bilge Water Treatment plant with 10 KLD capacities and awarded the work to to M/s. Gujarat Enviro Protection Infrastructure Limited (GEPIL), Surat. GMB has awarded the work for Third Party Inspection (TPI) for the said upgradation to GITCO Ltd. GITCO provided overall project management consultancy in form of third-party inspection agency for design, construction, supply and installation of all the four units. GITCO started the work by Reviewing and vetting of Project report consisting of Design, Sections, Drawings of Landfill Cells, Incinerator along with firefighting system and Bilge &amp; Leachate Water Treatment submitted by GEPIL to GMB. Vetting &amp; certification was done for different phases of construction as per approved design. All the units were approved &amp; completion certificate was issued for all above four units after carrying out necessary testing and procedures as per prevailing norms. GITCO had submitted detailed compliance report to GMB for the work done by GEPIL.</p>		



<b>Name of project</b>	:	<b>Geo-hydrological study in &amp; around the premises for Ground water flow investigation for M/s. Sagar Drugs Pvt. Ltd., Ahmedabad, Gujarat</b>
<b>Year</b>	:	2006
<b>Project features</b>	:	<ul style="list-style-type: none"> <li>• Introduction of study</li> <li>• Climate &amp; Rainfall of area</li> <li>• Physiography</li> <li>• Geology</li> <li>• Subsurface geology &amp; Aquifer system</li> <li>• Details of existing tube wells</li> <li>• Movement of Ground water</li> <li>• Ground water flow &amp; its direction</li> <li>• Conclusion</li> </ul>
<b>Description of actual services provided within the assignment:</b>		
<p>M/s. Sagar Drugs &amp; Pharmaceuticals Pvt. Ltd. Is involved in the manufacturing of Vinyl Sulphone a Dye Intermediate. The basic objective of this study was to know the ground water flow direction around the factory area. GITCO has carried out detailed Geo-hydrological study In &amp; around the plant premises to access Ground water flow direction. A desk base study was carried out to know the data regarding Climate &amp; Rainfall, Physiography, Geology, Aquifer System &amp; Existing tube wells was collected. To decide the groundwater flow direction; static water level data around Singarva village were collected from Gujarat Water Resource Development Corporation Ltd. (GWRDC) and plotted on the map. From the reduced levels of tube wells, depth of static water levels were subtracted to obtain reduced levels of SWL.</p>		



Name of project	:	Geo-hydrological study In & around the premises for M/s. Gujarat Fluorochemicals Limited, Ranjitnagar, Halol, Gujarat
Year	:	2000
Project features	:	<ul style="list-style-type: none"> <li>• Introduction of study</li> <li>• Climate &amp; Rainfall of area</li> <li>• Physiography</li> <li>• Geology</li> <li>• Subsurface geology &amp; Aquifer system</li> <li>• Details of existing tube wells</li> <li>• Movement of Ground water</li> <li>• Ground water flow &amp; its direction</li> <li>• Conclusion</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>M/s. GFL is involved in the manufacturing of refrigerant gas. GITCO has carried out detailed Geo-hydrological study In &amp; around the premises of M/s. Gujarat Fluorochemicals Ltd. to assess the ground water flow direction around factory area and levels of fluoride in groundwater.</p>		



<b>Name of project</b>	:	Contamination study Related to the Dumping of Hazardous Waste at Vatva, Ahmedabad for M/s. Green Env. Co. Ser. Soc. Ltd.
<b>Year</b>	:	2000
<b>Project features</b>	:	<ul style="list-style-type: none"> <li>• Secondary data collection (i.e. Source &amp; Characteristics of sludge)</li> <li>• Site visit &amp; sludge sample collection</li> <li>• Analysis of Sludge</li> <li>• Soil quality analysis after removal of sludge from site</li> <li>• Review &amp; Interpretation of results</li> <li>• Observation &amp; Conclusion</li> </ul>
<b>Description of actual services provided within the assignment:</b>		
<p>Illegal dumping of hazardous waste was found near Express way that connects Ahmedabad to Baroda. GITCO was assigned the work of monitoring and site clearance. Prior to sample collection, the area was visually inspected to assessed. Soil samples from contaminated site were collected and assessed.</p>		



<b>Name of project</b>	:	Contaminated site Assessment & Remedial Measure to Eradicate &/Or Control Contamination for M/s. Swastik Organic, Himmatnagar, Gujarat
<b>Year</b>	:	2011
<b>Project features</b>	:	<ul style="list-style-type: none"> <li>• Site Assessment</li> <li>• Excavation of pit for soil sampling</li> <li>• Geo hydrological survey &amp; Investigation</li> <li>• Well inventory</li> <li>• Water sample collection from existing Tube wells</li> <li>• Indication of extent of soil &amp; ground water pollution</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>The unit was engaged in the manufacturing of different Dyes Intermediates from 1982-2004. During this period the unit had dumped Iron Sludge on open land near the factory premises. Over these many years the same has contaminated the below surface land and ground water. Contamination of Groundwater, land and surface water due to dumping of the is Iron Sludge was carried out. During this study GITCO has done Soil and Geo Hydrological survey &amp; investigation studies in and around the contaminated plant site of Swastik Organics. The base line data was collected, compiled, analyzed and interpreted to assess the present status of soil and ground water conditions and identifying probable reasons for distribution of pollutant in underground soil and water environment, if any. As per the investigation studies and findings remedial measures were suggested.</p>		



**ANNEXURE 2.1**  
**Letter from MoEF for Gypsum as Non-Hazardous Substance**

2



F. No.23-161/2014-HSMD  
Government of India  
Ministry of Environment & Forests  
HSM Division

2<sup>nd</sup> Floor, Jal Block  
Indira paryavaran Bhawan  
Jor Bagh Road, Aliganj  
New Delhi - 110 003  
Date: 17<sup>th</sup> October 2014

**Subject: - Permission for backfilling of mines by M/s Ashapura volclay Ltd.,  
Bhuj-Kutch -reg.**

This is with reference to letter dated 16/06/2014 regarding the subject cited above from M/s Ashapura Volclay Ltd. (copy enclosed)

2. The matter was considered in this Ministry during the 32<sup>nd</sup> Meeting of Technical Review Committee held on 24<sup>th</sup> September 2014. The committee was informed that the gypsum is produced by the neutralization of sulphuric acid containing leach liquor obtained from the leaching of bentonite clay, by lime. The analysis reports by SGS and Pollution laboratories, Surat submitted by the applicant does not indicate the presence of any hazardous constituents above the limits.

3. Accordingly, as per recommendation of the committee, the Ministry is of the view that the gypsum from this source can be categorized as non-hazardous.

This issue with the approval of competent authority.

  
(Dr. Shruti Rai Bhargava)  
Joint Director/Scientist 'D'  
Telefax- 24695333

To ✓ M/S Ashapura Volclay Limited  
Village Ler, Near Bhujodi,  
Off Anjar-Bhuj Highway,  
Bhuj-Kutch-370020

CC to:

The Member Secretary,  
Gujarat Pollution Control Board (GPCB),  
Paryavaran Bhawan Sector-10A,  
Gandhinagar-382010, Gujarat



**ANNEXURE 3.1**  
**ANALYSIS REPORTS OF BY DETOX INDIA PVT. LTD.**





DETOX GROUP

Detox Corporation Pvt. Ltd. — Lab Division

MOEF Recognised & NABL Accredited Laboratory

### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-1
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SOL1/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S1/1C Ashapura perfolclay, bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat.

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

Notes : (1) The results pertain to tested items only.

(2) This report shall not be reproduced except in full and authenticity of this report must be validated with office copy at Detox Corporation Pvt. Ltd.

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 Land Line : +91 72111 57105 Fax : +91 261 2354068  
 E-mail : info@detoxgroup.in Web site : www.detoxgroup.in  
 CIN : U41000GJ200PTC048470 GSTIN : 24AACCD4574F1ZU





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Detox Corporation Pvt. Ltd. — Lab Division

MOEF Recognised & NABL Accredited Laboratory

### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-25
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SOL35/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S1/1 B Ashapura perfoclay,bhujodi	%	< 0.4	0.40	SOP NO: dcpl/50/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho: Signatory

Notes : (1) The results pertain to tested items only.

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### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-2
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0L2/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalakhambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H2O	Method Detection Limit	Method of Measurement
1	52/2C Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

Notes : (1) The results pertain to tested items only.

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### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited,	Test Report No : DCPL/ENV/2002/24-26
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SOL36/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S2/2 B Ashapura perfoclay,bhujodi	%	< 0.4	0.40	SOP NO: dcpl/SO/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho: Signatory

Notes : (1) The results pertain to tested items only.

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CIN : U41000GJ200PTC048470 GSTIN : 24AACCD4574F1ZU





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### Soil Sample Analysis Report

<b>[1] Client Name &amp; Address:</b>	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-3
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

<b>[2] Sampling Details :</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SOL3/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 17.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

<b>[3] Results :</b>					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S3/3C Ashapura perfoclay,bhujodi	%	<0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

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### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No: DCPL/ENV/2002/24-27
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0L37/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 17.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H2O	Method Detection Limit	Method of Measurement
1	S3/3B Ashapura perfoclay,bhujodi	%	< 0.4	0.40	SOP NO: dcpl/50/Gypsum Content/031.Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Autho. Signatory

Date : 19.03.2020

Notes : (1) The results pertain to tested items only.

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CIN : U41000GJ2000PTC048470 GSTIN : 24AACCD4574F1ZU





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### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-4
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0L4/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	54/4C Ashapura perfo clay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

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CIN : U41000GJ200PTC048470 GSTIN : 24AACCD4574F1ZU





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### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-28
"GITCO House" opp. Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SOL38/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S4/4B Ashapura perfoclay, bhujodi	%	< 0.4	0.40	SOP NO: dcpl/50/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

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 E-mail : info@detoxgroup.in Web site : www.detoxgroup.in  
 CIN : U41000GJ200PTC048470 GSTIN : 24AACCD4574F1ZU





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### Soil Sample Analysis Report

<b>[1] Client Name &amp; Address:</b>	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-5
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

<b>[2] Sampling Details:</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SOL5/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

<b>[3] Results:</b>					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S5/5C Ashapura perfoclay, bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

Notes : (1) The results pertain to tested items only.

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## Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-29
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SOL39/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalakhambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O	Method Detection Limit	Method of Measurement.
1	SS/5B Ashapura perfoclay,bhujodi	%	< 0.4	0.40	SOP NO: dcpl/SO/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho: Signatory

Notes : (1) The results pertain to tested items only.

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### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-6
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SCL6/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S6/6C Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho: Signatory

Notes : (1) The results pertain to tested items only.

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## Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-30
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SOL40/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	56/6B Ashapura perfoclay,bhujodi	%	< 0.4	0.40	SOP NO: dcpl/SO/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho: Signatory

Notes : (1) The results pertain to tested items only.

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### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-7
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SOL7/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H2O	Method Detection Limit	Method of Measurement
1	S7/7C Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT.-LTD.

Date : 19.03.2020

Autho. Signatory

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### Soil Sample Analysis Report

<b>[1] Client Name &amp; Address:</b>	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-31
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

<b>[2] Sampling Details :</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : 501-09/50L41/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

<b>[3] Results :</b>					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S7/7B Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/50/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho: Signatory

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### Soil Sample Analysis Report

<b>[1] Client Name &amp; Address:</b>	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-B
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

<b>[2] Sampling Details :</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0L8/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 17.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

<b>[3] Results :</b>					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S8/8C Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031,01.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

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### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-32
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SOL42/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	58/8B Ashapura perfoclay, bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/50/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

Date : 19.03.2020

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### Soil Sample Analysis Report

**[1] Client Name & Address:**

Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-9
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

**[2] Sampling Details:**

Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0L9/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling :--
Test Completion Date : 03.03.2020	Soil sample

**[3] Results:**

Sr.No.	Location of sampling	Unit	Results of Gypsum as $CaSO_4.2H_2O$	Method Detection Limit	Method of Measurement
1	59/9C Ashapura perfoclay, bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031, Dt. 01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

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### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-33
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[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : 501-09/50L43/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02- 2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location OF Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	59/98 513/13B Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

Date : 19.03.2020

Notes : (1) The results pertain to tested items only.

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### Soil Sample Analysis Report

<b>[1] Client Name &amp; Address:</b>	
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"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

<b>[2] Sampling Details :</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : 501-09/SOL10/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalakhambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

<b>[3] Results :</b>					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S10A/10A C Ashapura perfolclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/50/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Autho. Signatory

Date : 19.03.2020

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### Soil Sample Analysis Report

**[1] Client Name & Address:**

Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-10
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

**[2] Sampling Details :**

Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SOL10/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

**[3] Results :**

Sr.No.	Location of sampling	Unit	Results of Gypsum as $CaSO_4 \cdot 2H_2O$	Method Detection Limit	Method of Measurement
1	S10B/10B CAshapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT-LTD.

Date : 19.03.2020

Autho. Signatory

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### Soil Sample Analysis Report

[1] Client Name & Address:	
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"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0L10/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S10B/10B C Ashapura perfo clay, bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Auth. Signatory

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### Soil Sample Analysis Report

[1] Client Name & Address:	
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"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
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[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0L24/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 17.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H2O	Method Detection Limit	Method of Measurement
1	S10C/10C C Ashapura perfolday,bhujodi	%	< 0.4	0.40	SOP NO: dcpl/SO/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho: Signatory

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### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-23
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : 501-09/50L23/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 17.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No:	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S11/11C Ashapura perfoclay,bhujodi	%	< 0.4	0.40	SOP NO: dcpl/50/Gypsum Content/031, Dt. 01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Autho: Signatory

Date : 19.03.2020

Notes : (1) The results pertain to tested items only.

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## Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-34
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009.	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : 501-09/SOL46/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	511/11B Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

Notes : (1) The results pertain to tested items only.

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### Soil Sample Analysis Report

**[1] Client Name & Address:**

Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-12
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

**[2] Sampling Details :**

Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0L12/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G / 1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss,Zalak khambhata
Test Start Date : 27.02.2020	Location OF Sampling : --
Test Completion Date : 03.03.2020	Soil sample

**[3] Results :**

Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S12/12C Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

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### Soil Sample Analysis Report

<b>[1] Client Name &amp; Address:</b>	
Gujarat Industrial & Technical Consultancy Organization Limited,	Test Report No : DCPL/ENV/2002/24-35
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad - 380009	Report Page (s): 1 of 1

<b>[2] Sampling Details :</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0L49/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling :---
Test Completion Date : 03.03.2020	Soil sample

<b>[3] Results :</b>					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H2O	Method Detection Limit	Method of Measurement
1	S12/12B Ashapura perfect clay, bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Author Signatory

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### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-13
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0L13/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd,	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1.	S13/13C Ashapura perfo clay, bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

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<b>[1] Client Name &amp; Address:</b>	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-33
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
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<b>[2] Sampling Details :</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : 501-09/SOL43/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

<b>[3] Results :</b>					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S9/98 S13/13B Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

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[1] Client Name & Address:	
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"GITCO House" opp. Sardar Patel Stadium Road	Issue Date : 19.03.2020
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[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0L14/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G / 1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss. Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H2O	Method Detection Limit	Method of Measurement
1	S14/14C Ashapura perfo clay, bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

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[1] Client Name & Address:	
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[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : 501-09/50L42/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H2O	Method Detection Limit	Method of Measurement
1	S8/8B Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Author Signatory

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### Soil Sample Analysis Report

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[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0L15/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G / 1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results:					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H2O	Method Detection Limit	Method of Measurement
1	S15/15C Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031, Dt.01.03.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

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### Soil Sample Analysis Report

[1] Client Name & Address:	
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"GITCO House" opp Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : 501-09/SOL45/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	515/158 Ashapura perfolclay, bhujodi	%	< 0.4	0.40*	SOP NO: dcp/50/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

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### Soil Sample Analysis Report

[1] Client Name & Address:	
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"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
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[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SOL16/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S16/16C Ashapura perfo clay, bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

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### Soil Sample Analysis Report

**[1] Client Name & Address:**

Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-37
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

**[2] Sampling Details :**

Protocol Purpose : Solid Sample Analysis	Sample Lab ID : 501-09/50L45/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalakkhambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

**[3] Results :**

Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	515/15B Ashapura perfoclay, bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/50/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Autho. Signatory

Date : 19.03.2020

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### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-17
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad - 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0L17/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 17.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G / 1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H2O	Method Detection Limit	Method of Measurement
1	S17/17C Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031, Dt.01.03.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

Notes : (1) The results pertain to tested items only.

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### Soil Sample Analysis Report

<b>[1] Client Name &amp; Address:</b>	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-38
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

<b>[2] Sampling Details :</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0L54/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 17.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

<b>[3] Results :</b>					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S17/17B Ashapura perfolay, bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

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### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-18
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SOL18/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	518/18C Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

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### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-36
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0L44/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$	Method Detection Limit	Method of Measurement
1	S18/188 Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Autho. Signatory

Date : 19.03.2020

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### Soil Sample Analysis Report

<b>[1] Client Name &amp; Address:</b>	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-19
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

<b>[2] Sampling Details :</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0119/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

<b>[3] Results :</b>					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S19/19C Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to%.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

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### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-39
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/S0L53/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S19/19B Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcp/50/Gypsum Content/031,0t.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

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## Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-21
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad - 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : 501-09/SOL21/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	520 A/20A C Ashapura perfo clay, bhujodi	%	< 0.4	0.40	SOP NO: dcpl/SO/Gypsum Content/031, Dt. 01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

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### Soil Sample Analysis Report

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-22
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad - 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SOL22/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

[3] Results :					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S20 B/20B C Ashapura perfoclay,bhujodi	%	< 0.4	0.40	SOP NO: dcpl/SO/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT.LTD.

Date : 19.03.2020

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<b>[1] Client Name &amp; Address:</b>	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-20
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad - 380009	Report Page (s): 1 of 1

<b>[2] Sampling Details :</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SOL20/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

<b>[3] Results :</b>					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H2O	Method Detection Limit	Method of Measurement
1	S21/21C Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/SO/Gypsum Content/031, Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

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### Soil Sample Analysis Report

<b>[1] Client Name &amp; Address:</b>	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2002/24-40
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page {s}: 1 of 1

<b>[2] Sampling Details :</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S01-09/SOL47/27022020
Sampling Procedures : Not Specified	Description of Sample : Soil sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 03.03.2020	Soil sample

<b>[3] Results :</b>					
Sr.No.	Location of sampling	Unit	Results of Gypsum as CaSO4.2H <sub>2</sub> O	Method Detection Limit	Method of Measurement
1	S21/21B Ashapura perfoclay,bhujodi	%	< 0.4	0.40*	SOP NO: dcpl/50/Gypsum Content/031,Dt.01.01.2020

\* MDL in mg/kg. The result is converted to %.

Place : Surat

For DETOX CORPORATION PVT. LTD.

Date : 19.03.2020

Autho. Signatory

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## ANNEXURE 3.2

### National Program for Rehabilitation of Polluted Sites in India

#### Guidance document for assessment and remediation of contaminated sites in India

#### Volume II – Standards and checklists

1<sup>st</sup> Edition, March 2015



Ministry of Environment and Forests  
GOVERNMENT OF INDIA



## Volume II-2.1-b Screening and Response levels

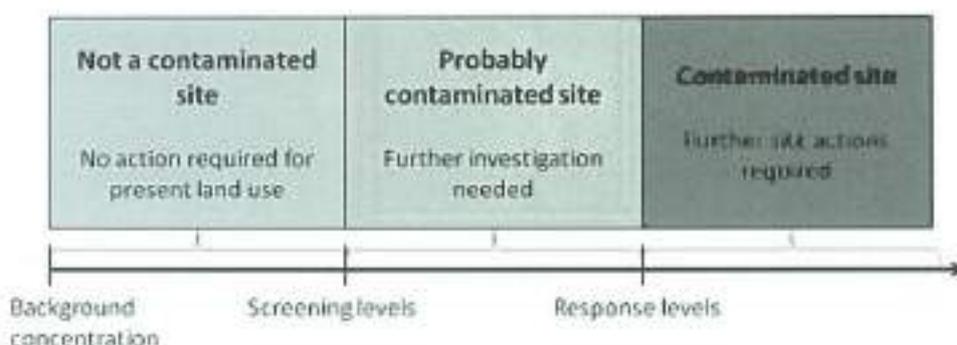
### 1 Introduction

This information is relevant for various Steps and Tasks in the assessment and remediation process.

Screening and Response levels are important to assess the level of contamination.

Screening levels are generic concentrations of hazardous substances in soil and sediments, groundwater and surface water at or below which potential risks to human health or the environment are not likely to occur and where no further investigation and assessment is needed. These Screening levels are distinguished for land use.

Response levels are generic concentrations of hazardous substances in soil and sediments at or above which it is very likely there is threat to human health or the environment, that may be imminent. At or above this level some form of response is required to provide an adequate level of safety to protect public health and/or the environment.



Note that for certain contaminants such as Persistent Organic Pollutants, no background concentrations should be used, as there is no natural background for these substances.

### 2 Screening and Response levels

The table on next pages provides the Screening and Response levels.



Volume II-2.1-b Screening and Response levels

Chemical Name	Chemical Group	Soil (Screening and Response Levels)				Groundwater for drinking water (Screening levels)				Surface water Quality (Screening levels)				Canadian Water Quality Guidelines for the Protection of Aquatic Life
		Levels in soil (mg/kg)	Response levels (Dutch interim-version levels)	Screening levels Soil Quality Guidelines for the Protection of Environmental and Human Health		Standards for Drinking Water* (Maximum acceptable concentration)	Guidelines for Canadian Drinking Water Quality	WHO guidelines for Drinking water	The Environment (Protection) Act, 1986 Schedule VI General standards for discharge of environmental pollutants			Canadian Water Quality Guidelines for the Protection of Aquatic Life		
				Agricultural	Residential/ parkland				Commercial	Industrial	Inland surface waters		Public access	
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/L	
1,1,1-Trichloroethane (TCA)	Halogenated aliphatic compounds	5000	15	0.1	5	5	5	5	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane (PCE)	Halogenated aliphatic compounds	5000	8.8	0.1	0.2	0.5	0.5	0.6	0.03	0.04	-	-	1.0	-
1,1,2,2-Tetrachloroethane	Halogenated aliphatic compounds	5000	-	0.1	5	5	5	5	-	-	-	-	-	-
1,1,2-Trichloroethane	Halogenated aliphatic compounds	5000	10	0.1	5	5	5	5	-	-	-	-	-	-
1,1,2-Trichloroethane (TCE)	Halogenated aliphatic compounds	5000	2.5	0.01	0.03	0.01	0.01	0.01	0.005	0.02	-	-	21	100
1,1-Dichloroethane	Halogenated aliphatic compounds	5000	15	0.1	5	5	5	5	-	-	-	-	-	-
1,1-Dichloroethane	Halogenated aliphatic compounds	5000	0.3	0.1	5	5	5	5	0.014	-	-	-	-	-
1,1,2,4-Tetrachlorobenzene	Halogenated aromatic compounds	50	2.2	0.05	2	10	10	10	-	-	-	-	1.8	-
1,2,3,5-Tetrachlorobenzene	Halogenated aromatic compounds	50	2.2	0.05	2	10	10	10	-	-	-	-	8	-
1,2,4-Trichlorobenzene	Halogenated aromatic compounds	50	11	0.05	2	10	10	10	-	-	-	-	8	-
1,2,4,5-Tetrachlorobenzene	Halogenated aromatic compounds	50	2.2	0.05	2	10	10	10	-	-	-	-	-	-
1,2,4-Trichlorobenzene	Halogenated aromatic compounds	50	3.1	0.05	2	10	10	10	-	-	-	-	24	-
1,2-Dichlorobenzene	Halogenated aromatic compounds	50	19	0.1	1	10	10	10	-	1	-	-	0.7	-
1,2-Dichlorobenzene	Halogenated aromatic compounds	5000	6.4	0.1	5	5	5	5	0.008	0.005	0.003	-	100	25
1,2-Dichlorobenzene	Halogenated aromatic compounds	5000	1	0.1	5	5	5	5	-	0.05	0.05	-	-	-
1,2-Dichlorobenzene	Halogenated aromatic compounds	5000	2	0.1	5	5	5	5	-	0.04	-	-	-	-
1,2-Dichlorobenzene (cis and trans)	Halogenated aliphatic compounds	5000	0.1	0.1	5	5	5	5	-	-	-	-	-	-
1,3,5-Trichlorobenzene	Halogenated aromatic compounds	50	0.05	0.1	2	10	10	10	-	-	-	-	-	-
1,3-Dichlorobenzene	Halogenated aromatic compounds	50	0.1	0.1	1	10	10	10	-	-	-	-	150	-
1,4-Dichlorobenzene	Halogenated aromatic compounds	50	0.1	0.1	1	10	10	10	-	0.005	0.3	-	20	-
1,4-Dioxane	Halogenated aromatic compounds	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,6-Tetrachlorophenol	Halogenated aromatic compounds	50	0.05	0.5	5	5	5	5	-	0.1	-	-	-	-
2,4,6-Trichlorophenol	Halogenated aromatic compounds	50	0.05	0.5	5	5	5	5	-	0.065	0.2	-	-	-
2,4-Dichlorophenol	Halogenated aromatic compounds	50	0.05	0.5	5	5	5	5	-	0.8	-	-	-	-
2,4-Dichlorophenoxyacetic acid (2,4-D)	Pesticides (Phenoxy herbicide)	-	-	-	-	-	-	-	0.03	-	-	-	-	-
3-Hydro-2-propenyl butyl carbamate	Pesticides, Carbamate	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	Polycyclic aromatic hydrocarbons (PAH)	-	-	-	-	-	-	-	-	-	-	-	1.9	-
Acenaphthylene	Polycyclic aromatic hydrocarbons (PAH)	-	-	-	-	-	-	-	-	-	-	-	5.8	-
Acridine	Polycyclic aromatic hydrocarbons (PAH)	-	-	-	-	-	-	-	-	-	-	-	0.4	-
Adicarb	Pesticides, Carbamate	-	-	-	-	-	-	-	-	0.089	0.91	-	1	54.9/11
Aldrin	Pesticides, Organochlorine	50	0.32	-	-	-	-	-	0.00003	0.0007	0.00003	-	0.004	-
Alphachloroacetate (tech)	Non-halogenated aliphatic compounds	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum	Metal	-	-	-	-	-	-	-	0.03	-	-	-	-	-
Ammonia (total)	Inorganic	30000	-	-	-	-	-	-	0.5	-	-	-	Variable	-
Ammonia (nitrogen)	Inorganic	-	-	-	-	-	-	-	-	-	-	-	Table	-
Asflin	Organic	-	-	-	-	-	-	-	-	-	-	-	19	-
Anthracene	Polycyclic aromatic hydrocarbons (PAH)	50	22	0.1	1	10	10	10	-	-	-	-	2.2	-
Antimony (nicotinic)	Inorganic	50	22	20	20	40	40	40	0.06	0.02	-	-	0.012	-
Ascorbic	Metal	50	50 (70)	12	11	12	12	12	0.01	0.01	0.3	0.2	0.1	5



Chemical Name	Chemical Groups	Soil (Screening and Response Levels)				Groundwater for drinking water (Screening levels) <sup>4</sup>			Surface water Quality (Screening levels)									
		Levels in Soil (MWH Rules, 2016) <sup>11</sup>	Response Levels (Dutch Inter-vention Levels) <sup>12</sup>	Screening Levels for the Protection of Environmental and Human Health <sup>13</sup>		Indian Standard for Drinking Water (Maximum acceptable concentration)	Guidelines for Drinking Water Quality	WHO Guidelines for Drinking water	The East African Protection Rules, 1996 Schedule VI General standards for discharge of environmental pollutants									
				Agricultural	Residential/ parkland				Commercial	Industrial	Inland surface water	Public rivers	Land for irrigation	Marine coastal waters	Canadian Water Quality Guidelines for the Protection of Aquatic Life	Canadian Water Quality Guidelines for the Protection of Agriculture		
Acetic acid	Pesticides, Triazine	5000	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Azinphos	Pesticides, Triazine	-	0.71	-	-	-	-	0.002	0.005	0.002	-	-	-	1.8	-	-	-	305
Barium	Inorganic	20000	-	750	900	2020	2020	0.7	1.0	0.7	-	-	-	-	-	-	-	-
Benzene	Monocyclic aromatic compounds	50	1.1	0.05	0.5	5.0	5.0	-	0.003	-	-	-	0.01*	0.01*	0.01*	-	-	370
Benzobenzothiazole	Polycyclic aromatic hydrocarbons (PAH)	50	-	0.1	1.8	10.0	10.0	-	-	-	-	-	-	0.018	-	-	-	-
Benzofuran	Polycyclic aromatic hydrocarbons (PAH)	50	-	0.1	1.8	10.0	10.0	-	0.0005	-	-	-	-	0.015	-	-	-	-
Benzofluoranthene	Polycyclic aromatic hydrocarbons (PAH)	-	-	0.1	1.8	10.0	10.0	-	-	-	-	-	-	-	-	-	-	-
Benzopyranthrene	Polycyclic aromatic hydrocarbons (PAH)	50	-	0.1	1.8	10.0	10.0	-	-	-	-	-	-	-	-	-	-	-
Benzylurea	Inorganic	50	-	4	4	8	8	-	-	-	-	-	-	-	-	-	-	200/100
Boron	Inorganic	-	-	3	-	-	-	0.5	5.0	-	-	-	-	-	-	-	-	5000/5000
Bromacil	Pesticides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2/1100
Bromoxynil	Pesticides, Benzothiazole	-	-	-	-	-	-	-	0.025	-	-	-	-	-	-	-	-	0.33/11
Cadmium	Metal	50	11	1.4	10	22	22	0.003	0.016	-	-	-	2	1	2	-	-	Equation 5.1/90
Calcium	Inorganic	-	-	-	-	-	-	75	-	-	-	-	-	-	-	-	-	7/1000000
Captaf	Pesticides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4/3
Carbaryl	Pesticides, Carbamate	-	0.40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5
Carbofuran	Pesticides, Carbamate	-	0.037	-	-	-	-	-	0.09	-	-	-	-	0.01	0.01	-	-	0.2
Chlorobenzene	Pesticides, Organochlorine	50	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.8
Chloride	Inorganic	-	-	-	-	-	-	250	-	-	-	-	-	-	-	-	-	4/5
Chloroacetyl	Pesticides, Organochlorine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7/7
Chlorobutadiene	Pesticides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Variable/
Chlorpyrifos	Pesticides, Organophosphorus	5000	-	-	-	-	-	0.01	0.09	0.03	-	-	-	-	-	-	-	0.10
Chromium (total)	Metal	-	-	64	64	87	87	-	0.06	0.05	-	-	2	2	2	-	-	0.002
Chromium, hexavalent (Cr(VI))	Metal	50	50 (74)	0.4	0.4	1.4	1.4	0.05	-	-	-	-	0.1	2	2	-	-	1
Chrominum, trivalent (Cr(III))	Metal	5000	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9
Chrysene	Polycyclic aromatic hydrocarbons (PAH)	50	-	0.1	1.8	10.0	10.0	-	-	-	-	-	-	-	-	-	-	-
Cobalt	Inorganic	5000	190	40	50	300	300	-	-	-	-	-	-	-	-	-	-	8/30
Coliforms, fecal (Escherichia coli)	Biological	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Coliforms, total	Biological	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colour	Physical	-	-	-	-	-	-	5	Plates Units	-	-	-	-	-	-	-	-	-
Conductivity	Physical	-	-	2 dS/m	2 dS/m	4 dS/m	4 dS/m	-	-	-	-	-	-	-	-	-	-	-
Copper	Metal	5000	100	63	63	91	91	0.05	0.01	0.006	-	-	3	3	3	-	-	Equation 2
Cyanazine	Pesticides, Triazine	-	-	-	-	-	-	-	0.01	0.006	-	-	-	-	-	-	-	0.5/10
Cyanide	Inorganic	50	10	0.9	0.9	8	8	0.05	0.2	0.20	-	-	0.2	2	2	-	-	5 (as free CN)
Cyanobacteria	Biological	-	-	-	-	-	-	-	0.013	-	-	-	-	-	-	-	-	-
Dieldrin	Physical	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodioxin	Pesticides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D,12-ethylhexyl phthalate	Phthalate esters	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0004
D-n-butyl phthalate	Phthalate esters	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18







Volume 4-2.3-b Screening and Response Levels

Chemical Name	Chemical Group	Soil (Screening and Response Levels)				Groundwater for drinking water (Screening levels) 4				Surface Water Quality (Screening levels)							
		Levels in soil (mg/kg) (USEPA 2008) 2	Response levels (Dose-Intervention levels) 3	Screening levels for the Protection of Environmental and Human Health 5		Indian Standard for Drinking Water 6 (Maximum acceptable concentration) mg/l	Guidelines for Conceptual Drinking Water Quality	WHO guidelines for Drinking water	The Environment (Protection) Rules, 1986 - Schedule VI General standards for discharge of environmental pollutants					Canadian Water Quality Guidelines for the Protection of Aquatic Life	Canadian Water Quality Guidelines for the Protection of Agriculture		
				Agricultural mg/kg	Residential/pretreated mg/kg				Commercial mg/kg	Industrial mg/kg	Public sewers mg/l	Land for Irrigation mg/l	Marine (coastal) mg/l			Long-term Freshwater mg/l	
Barbiturates	pesticides, Organochlorine compounds	50	-	-	-	-	-	-	-	-	-	-	0.004	-	-		
Benzothiazole	pesticide, aromatic hydrocarbons (PAHs) compounds	50	0.1 H	1 H	10 H	10 H	-	-	-	-	-	-	0.1	-	-		
Phenolic compounds (as CAS/CBI)	pesticides	5000	14	1	10	10	-	0.003	-	-	-	-	-	5	-		
Phenols (mono- & dihydric)	Aromatic hydroxy compounds	5000	3.8	3.8	3.8	3.8	-	-	-	-	-	-	4	4	72		
Phenox herbicides	Pesticides	-	-	-	-	-	-	-	-	-	-	-	-	-	4	7100	
Phosphorus (as P)	Inorganic	20000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Phthalic acid esters (leach)	Phthalate esters	-	-	30	-	-	-	-	-	-	-	-	-	-	-	-	
Pickarim	Pesticides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PCBs (Polychlorinated biphenyls)	Polychlorinated biphenyls	50	1	0.5	1.3	33	33	0.0005	-	-	-	-	-	-	-	-	
Polycyclic Hydrocarbons (PHH)	Polycyclic aromatic hydrocarbons (PAH)	-	40	-	-	-	33	0.0001	-	-	-	-	-	-	-	-	
Polychlorinated dibenzo-p-dioxins/dibenzofurans	Polychlorinated dioxins and furans	-	0.0001 B	1	1	1	1	4 mg TCO/kg	4 mg TCO/kg	4 mg TCO/kg	4 mg TCO/kg	1	-	-	-	-	
Propylene glycol	Glycols	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Pyrene	Polycyclic aromatic hydrocarbons (PAH)	-	-	0.1 µ	1 µ	10 µ	30 µ	-	-	-	-	-	-	-	500000	-	
pH	Inorganic Acidity, alkalinity and pH	-	-	6 to 8	6 to 8	6 to 8	6 to 8	6.5-8.5	-	-	-	-	5.5-9.0	3.3-9.0	5.5-9.0	3.5-9.0	6.3 to 9.0
Quinoline	Polycyclic aromatic hydrocarbons (PAH)	-	-	0.1 H	1 H	10 H	30 H	-	-	-	-	-	-	-	-	-	3.4
Reactive Chlorine Species	Inorganic Reactive chlorine compounds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5
Salinity	Physical	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	Inorganic	50	1	1	2.9	2.9	2.9	0.01	0.01	0.01	0.01	0.01	0.05	0.05	0.05	0.05	1
Silver	Inorganic	5000	20	20	40	40	40	0.1	0.1	0.1	0.1	0.1	-	-	-	-	0.1
Sresozim	Pesticides, Triazine	-	-	-	-	-	-	-	-	0.01	0.002	-	-	-	-	-	10
Sulfamethoxazole	Organic sulphur compound	-	3	5	12	12	12	-	-	-	-	-	-	-	-	-	-
Sulfamonomethoxate	Organic sulphur compound	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Synazine	Monocyclic aromatic compounds	20000	86	0.1	5	50	50	-	-	-	-	0.02	-	-	-	-	72
Sulfolane	Organic sulphur compound	-	-	0.8	0.8	0.8	0.8	-	-	-	-	-	-	-	-	-	50000
Sulphate	Inorganic inorganic sulphur compounds	-	-	-	-	-	-	200	-	-	-	-	-	-	-	-	-
Sulphur (elementary)	Inorganic inorganic sulphur compounds	50000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Suspended sediments	solids Total particulate matter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluthion	Pesticides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluthion	Pesticides	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature	Physical Temperature	-	-	-	-	-	-	-	-	-	-	-	above	-	-	-	-
Tetrachloroethane	Halogenated aliphatic compounds	5000	0.7	0.1	5	50	50	-	-	-	-	-	-	-	-	-	75
Tetrachloroethene	Halogenated aromatic compounds	50	21	0.05	0.5	5	5	0.1	0.1	0.1	0.1	-	-	-	-	-	1
Thalium	Inorganic	50	1	1	1	1	1	-	-	-	-	-	-	-	-	-	0.8
Thiophene	Miscellaneous organic compound	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin (inorganic)	Inorganic	5000	5	5	30	30	30	-	-	-	-	-	-	-	-	-	-
Tin (organic)	Organic	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tolazam	Monocyclic aromatic compounds	20000	12	0.1	3	30	30	-	-	-	-	0.7	-	-	-	-	2
Total dissolved solids (TDS)	solids	-	-	-	-	-	-	500	-	-	-	-	100	600	200	100	-
Total hydrocarbons (THC) (mineral oil)	solids	50000	5000	-	-	-	-	0.5	-	-	-	-	10	20	10	20	-



Chemical Name	Chemical Groups	Soil (Screening and Response Levels)				Groundwater for drinking water (Screening levels) <sup>ii</sup>			Surface water Quality (Screening levels)						
		Response levels (Dutch water quality rules, 2000) <sup>iii</sup>	Screening levels (Soil Quality Guidelines for the Protection of Environmental and Human Health) <sup>v</sup>			Indian Standard for Drinking Water - (Maximum acceptable concentration)	Subclass for Canadian Drinking Water Quality	WHO guidelines for drinking water	The Environment Protection Act, 1986 Schedule VI General standards for abstracts of environmental pollutants					Canadian Water Quality Guidelines for the Protection of Aquatic Life	Canadian Water Quality Guidelines for the Protection of Agriculture
			Agricultural (parkland)	Residential/ Commercial	Industrial				mg/l	mg/l	mg/l	mg/l	mg/l		
Toxicants	Pesticides, Organochlorine	50	-	-	-	-	-	-	-	-	-	0.008	-	-	
Trihalide	Pesticides, Carbamate	-	-	-	-	-	-	-	-	-	-	0.24	-	-	
Infrared methane	Halogenated aliphatic compounds	5000	-	-	-	-	-	-	-	-	-	-	-	-	
Trihaloethyln	Organic compounds	50	-	-	-	-	-	-	-	-	-	0.008	-	-	
Trihalofen	-	-	-	-	-	-	-	-	-	-	-	0.009	-	-	
Trichloroethane (chloroform)	Halogenated aliphatic compounds	5000	0.7	0.1	5	50	50	0.2	-	0.3	-	1.8	-	-	
Trichloroethene	Halogenated aromatic compounds	50	21	0.05	0.5	5	5	-	0.005	-	-	18	-	-	
Trichlorobenzene	Organic compounds	-	-	-	-	-	-	-	-	-	-	-	-	-	
Trifluoroethylene	Organic compounds	-	-	-	-	-	-	-	-	-	-	-	-	-	
Trifluoromethane	Organic compounds	-	-	-	-	-	-	-	-	-	-	-	-	-	
Triphenyltin	Organic compounds	50	-	-	-	-	-	-	-	0.02	-	-	-	-	
Turbidity	solids Total particulate matter	-	-	-	-	-	-	1 NTU	0.1-0.01TU	-	-	-	-	-	
Tungsten compounds	-	5000	-	-	-	-	-	-	-	-	-	-	-	-	
Uranium	inorganic	-	23	23	33	300	300	-	0.06	0.015	-	-	35	10/200	
Vinylchloride	Halogenated aliphatic compounds	5000	0.1	-	-	-	-	-	0.002	0.0003	-	-	-	-	
Xenadium	inorganic	5000	130	130	130	130	130	-	-	-	-	-	-	-	
Xylene	Alicyclic aromatic compounds	20000	17	0.3	5	50	50	-	-	0.5	-	-	-	-	
Zinc	Metal	20000	730	200	200	200	200	5	-	-	-	5	15	15	

NR: No relocation

ii) CCME (Canadian Council of Ministers of the Environment), 1991. Interim Canadian environmental quality criteria for contaminated sites. CCME, Winnipeg.

iii) coarse fine sediment.

iv) as (iii) as a value from MWR 2000; yr is Dutch intervention values. In this case levels from MWR are used because these are lowest.

v) IC: 10000:2012

ii) referring to schedule II of the Hazardous Waste rules, 2008. These levels are not relevant for the assessment of contaminated sites, but may apply if during remediation material is excavated, transported and disposed of or treated.

Note: the total content of the various substances in categories S1, S10, 20000 and 50000 are indicated, should not exceed specified levels to be determined as hazardous waste.

ii) referring to Dutch intervention values which represent a level above which unacceptable risks may occur. The risk level by which these levels were determined takes into account a typical situation where people live and partly eat crops from the site. In this way these levels provide a relatively low level of risk, i.e. a conservative approach. The levels in this list are based on soil characteristics to be applied.

ii) referring to CCME Canadian Environmental Quality Guidelines, these levels represent a level of negligible risk and provide a good that is regarded to enable a healthy functioning system for different types of land use.

ii) Groundwater for drinking water: Screening levels: If Indian Standard for Drinking Water is not available for that parameter then referring to Guidelines for Canadian Drinking Water Quality and secondly to WHO Guidelines for drinking water.



# **ANALYSIS & ASSESSMENT OF SOIL & GROUND WATER QUALITY IN & AROUND 13 GYPSUM SITES**



**ASHAPURA PERFOCLAY LTD.(APL)**  
PLOT NO. 163, 164 & 167 VILLAGE: LER, TALUKA: BHUJ,  
DIST.: KUTCH, GUJRAT, INDIA

**PREPARED BY**



**GUJARAT INDUSTRIAL AND TECHNICAL  
CONSULTANCY ORGANISATION LIMITED**  
GITCO HOUSE, STADIUM ROAD, NAVRANGPURA  
AHMEDABAD - 380 009

**JUNE 2020**

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## 1.0 INTRODUCTION

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### 1.1 PREAMBLE:

M/s. Ashapura Perfoclay Ltd. (APL) was established in the year 2001 and is located at Plot No. 163, 164 & 167 Village: Ler, Taluka: Bhuj, Dist.: Kutch in a state of Gujarat. APL is a part of Ashapura Group of Industry. The unit has been granted Consolidated Consent & Authorization (CC&A) by Gujarat Pollution Control Board, vide Order No: AWH 93521 dated 11-06-2018, which is valid up to 24-06-2023 for manufacturing of Bleaching Clay. The same consent was amended vide order no. H-103222 dated 31/07/2019 and H-107040 date 05/03/2020 for alternate mode of disposal of Gypsum. Copy of same is attached as an **Annexure-1.1**.

During the process of Bleaching clay manufacturing, Spent Sulphuric Acid is generated. The first wash of spent is sent to M/s. IFFCO Ltd. Kandla for utilization under Rule-9 of HWM Rules, 2016 and the subsequent dilute Sulfuric Acid is neutralized with lime. During the neutralization of acidic wastewater, Gypsum is generated, which is separated in the filter press and sent to Cement Industry for co-processing and backfilling of exhausted / abandoned mines as per the existing CCA.

During the period from 2017 to 2019 the unit has laid the said Gypsum in low lying areas near the factory premises. Total 34 no. of sites have been identified where this Gypsum was utilized for land reclamation, mine backfilling of exhausted mines, soil condition etc. As per the available data from unit, they have lifted Gypsum from 21 sites. However, practically it is difficult to lift Gypsum from remaining 13 sites as Gypsum has become integral part of existing land.

The unit is interested to carryout study of Impact Assessment w.r.t. to Soil and Ground Water Quality due to laid of this Gypsum in and around factory premises at these 13 selected sites through reputed institute. In turn, M/s. APL entrusted M/s. Gujarat Industrial and Technical Consultancy Organization Ltd. (GITCO), Ahmedabad to undertake the said study. GITCO is a recognized Schedule-I Environment Auditor of Gujarat Pollution Control Board (GPCB) and its laboratory is NABL accredited. Copy of the same is attached as an **Annexure-1.2**.

This study report present Soil and Groundwater investigation in and around the 13 sites where Gypsum is laying at present. The base line data regarding soil and ground water quality has been collected, compiled, analyzed and interpreted to assess the present status of soil and ground water conditions in and around 13-identified sites, and identify probable reasons for distribution of pollutant in soil and water environment, if any.



## 1.2 SITE DESCRIPTION:

The identified 13 sites along with its details is shown in **Table No. 1.1**.

The site location map of study area is shown in **Figure No.1.1**.

Google Image of the study area is shown in **Figure No. 1.2**.

**Table No. 1.1**  
**Details of 13 – Gypsum sites**

Location	Name	Latitude	Longitude	Details
S1/22	Beside Kukma-Lakhond Village Road	23°13' 50" N	69°46'48" E	Public Infrastructure (Sewage line)
S2/23	Natural drain between farm of Dinesh Maharaj and Govind Vankar, Kukma Village	23°13'56" N	69°46'57" E	Crops are growing and Gypsum is used as a soil conditioner
S3/24	Shri Vankal mata Mandir	23°13'35" N	69°44'41" E	Plantation i.e. Neem, Gulmahor etc are growing and Gypsum is used as a soil conditioner
S4/25	Vrundavan Gir Gaudham, Shree Swaminarayan Mandir, Besides Ashapura Colony, Bhachau Road	23°13'49" N	69°46'48" E	Gowshala / Cowshed
S5/26	Pithora dada Mandir, Ler Village	23°10'23" N	69°46'50" E	Temple
S6/27	Land of Lakhond Village	23°15'12" N	69°46'41" E	Land Reclamation
S7/28	Adjacent site of site no. S6/27, Lakhond Village	23°15'11" N	69°46'44" E	Land Reclamation
S8/29	On Government Land, Padhdhar Village	23°14'29" N	69°48'44" E	Land Reclamation
S9/30	B/h. Mangal Mandir School, Village Bhujodi	23°13'45" N	69° 44'81" E	Land Reclamation



**Table No. 1.1 Cont.  
Details of 13 - Gypsum sites**

Location	Name	Latitude	Longitude	Details
S10/31	Behind Lehriya Hanuman	23°13'21"N	69°46'21"E	Exhausted mine backfilling as per EC Condition: SEIAA / GUJ / EC / 2(b) / 497 / 2016
S11/32	Old stone mine of Prakash Patel, Beside old Hot Mix plant, Kukma Village	23°13'20" N	69°46'30" E	Exhausted mine backfilling as per EC Condition: SEIAA / GUJ / EC / 2(b) / 497 / 2016
S12/33	Behind khatri mills, Beside of above site, Traverse, Government land, Kukma Village	23°13'20" N	69°45'58" E	Exhausted mine backfilling as per EC Condition: SEIAA / GUJ / EC / 2(b) / 497 / 2016
S13/34	China Clay mine of Village Lakhond, Abandoned mine.	23°15'39" N	69°47'17" E	Exhausted mine backfilling as per EC Condition: SEIAA / GUJ / EC / 2(b) / 497 / 2016



**Figure No.1.1.**  
**Site Location Map of Study Area**

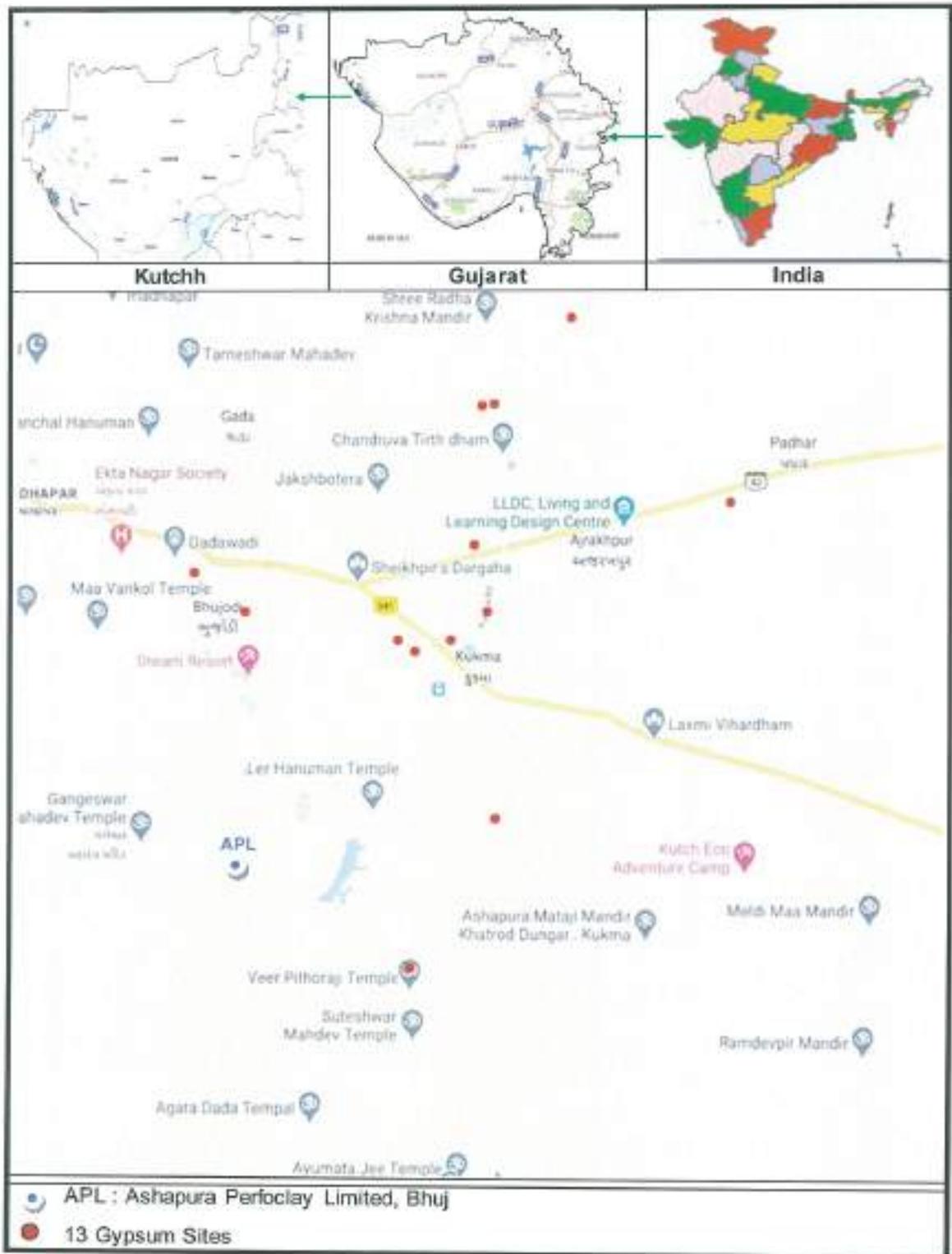


Figure No. 1.2.  
Google Image of Study Area



### 1.3 SCOPE & METHODOLOGY

- A desk base study was carried out on available information of the site along with process details viz. regarding raw material, process chemicals manufacturing process, sources and quantity of Gypsum and overview of process that generates Gypsum.
- Preliminary site visit for visual verification of the site by reviewing team and for formulating sampling and monitoring plan.
- Collection of relevant information viz.: soil, geology, hydrogeology in and around the plant area.
- Limited Sampling and testing were carried out to assess the impact and identify possible soil and ground water receptors pathways.
- Available Ground water & Soil samples were collected from in & around all identified 13 Gypsum sites including Gypsum samples. At each site, one virgin sample of soil was also collected to assess the base quality of soil. The soil samples were analyzed for physico-chemical parameters, Metal content and Gypsum content. The Ground water samples were analyzed for physico-chemical parameters.
- At all the identified 13 locations, where Gypsum is laid one sample was collected. Analysis of Gypsum was done for physico-chemical and TLCP / STLC parameters as listed metals in Class-A schedule-II of Hazardous Waste Management and Handling Rules, 2016(Schedule II).
- Screening, review and comparison of the Results will be done. For Soil and Ground Water Samples assessment they will be compared with virgin samples and screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines" Guidance document for assessment and remediation of contaminates sites in India, 2015". For Gypsum it was compared with the statutory limit as specified in the Hazardous Waste Management and Handling Rules, 2016 Class A-Schedule-II.
- Incorporating above all and preparation of report.



## 1.4 LIMITATIONS

The report is based upon the application of scientific principles and professional judgment to certain facts with resultant subjective interpretations. Professional judgments expressed herein are based on the facts, currently available within the limits of the existing data, scope of work, budget and schedule. To the extent that more definitive conclusions are desired by Client than are warranted by the currently available facts, it is specifically GITCO's intent that the conclusions and recommendations stated herein will be intended as guidance and not necessarily a firm course of action except where explicitly stated as such. The information provided to client in this report is not be construed as legal advice.



## 2.0 BACKGROUND OF THE STUDY

### 2.1 SITE HISTORY:

Total 34 no. of sites have been identified by Pollution Control Board, where this Gypsum was utilized for land reclamation, mine backfilling of exhausted mines, soil condition etc. The status of same is presented at Table No. **Table No. 2.1.**

As per available data from unit, 21 sites has been cleared and total 21271 tonne of Gypsum has been lifted and sent for backfilling at Mines of Mata-no-Madh as per Consent Order, during July 2019 to February 2020. It is practically difficult to lift Gypsum from remaining 13 sites, as these sites have become integral part of existing land.

**Table No. 2.1**  
**Status of 34 Gypsum Site**

DETAILS OF 21 SITES FROM WHERE GYPSUM IS REMOVED			
Sr. No.	Location	Status	Quantity (t)
1.	Besides of water tank of GWIL Sump, Kukma Village 23°13'18"N, 69°45'46" E	Site cleared	1149
2.	Land opposite and besides of Paddhar Village police station 23°14'29"N, 69°48'38"E	Site Cleared	561
3.	Behind Balaji Petrol Pump, Shaikhpir Chokdi, Bhuj Anjar Highway 23°13'41" N, 69°45'44" E	Site Cleared	907
4.	Near Matiyadev Mandir, Kukma Village, Near Kukma Water Distribution Tank 23°14'3" N, 69°46'15" E	Site Cleared	303
5.	Land between Swaminarayan wadi and Water sump of GWIL, Kukma Village 23°13'5.35"N, 69°45'46.43"E	Site Cleared	3068
6.	Natural Drain near Sanjot nagar, Behind Swaminarayan wadi 23°12'48.91" N, 69°46'8.03" E	Site Cleared	1535
7.	North side of Swaminarayan wadi 23°12'50" N, 69°46'9" E	Site Cleared	2757
8.	Opposite to Lehriya Hanuman Temple, Kukma Bhuj Road, Kukma Village 23°13'12" N, 69°46'17" E	Site cleared	551
9.	Vavdi Village 23°11'35" N, 69°49'42" E	Site cleared	1266



Sr. No.	Location	Status	Quantity (t)
10.	Land of Hetubha Jadeja, Ler Village	Site cleared	85
A	At Block Factory, Village Ler 23°12'5.56" N, 69° 45'35.78" E		
B	Near Block Factory, Village Ler 23°12'3.19" N, 69° 45'34.55" E		
C	Near Block Factory, Village Ler 23°12'6" N, 69° 45'34.62" E		
11.	Land at Village 23°12'43.57" N, 69° 44'28.14" E	Site cleared	380
12.	Near toll gate, Village lakhond 23°15'36.71" N, 69°46'48.23" E	Site cleared	1391
13.	Vavdi Village, Opp. Of Survey No. 85/1 23°11'31" N, 69°49'45" E	Site cleared	296
14.	Beside Lehriya Hanuman Temple, Kukma Village 23°13'24" N, 69°46'19" E	Site cleared	112
15.	At Dargah, Village Lakhond 23° 15'31.09" N, 69° 46'55.80" E	Site cleared	3580
16.	A At Village Lakhond 23° 15'39.39" N, 69°46'44.64" E	Site Cleared	22
	B At Village Lakhond 23°15'36.71" N, 69°46'48.23" E	Site Cleared	699
17.	Behind Ashapura Foundation school, Ashapura Colony, Bhachau Road, Kukma 23°14'7" N, 69°46'26" E	Site Cleared	187
18.	Farm on Lakhond Road, 23°14'49" N, 69°46'52" E	Site Cleared	1061
19.	Besides Balubha Rathod's Lake Ler Village 23°11'47" N, 69°46'17" E	Site Cleared	238
20	A At shekpir parle 23° 13'40.57" N, 69° 45'33.97"	Site Cleared	902
	B At shekpir parle 23° 13'33.74" N, 69° 45'28.75"	Site Cleared	43
21.	Lakhond- kali Talavadi Road, Village Lakhond 23°15'3" N, 69°46'48" E	Site Cleared	178
<b>TOTAL</b>			<b>21271</b>



STATUS OF REMAINING 13 GYPSUM SITES		
Sr. No.	Location	Site Status
22.	Beside Kukma - Lakhond Village Road 23°13' 50" N, 69°46'48" E	PUBLIC INFRASTRUCTURE (Sewage line- Gypsum used for providing structural support.)
23.	Natural drain between farm of Dinesh Maharaj and Govind Vankar, Kukma Village 23°11'56" N, 69°46'47" E	Plantation i.e. Neem, Gulmahor etc are growing and Gypsum is being used as a soil conditioner.
24.	Shri Vankal mata Mandir 23°13'35.44" N, 69°44'41.32" E	Crops growing and Gypsum is being used as a soil conditioner.
25.	Vrundavan Gir Gaudham, Shree Swaminarayan Mandir, Besides Ashapura Colony, Bhachau Road, 23°13'49" N, 69°46'48" E	Gowshala / Cowshed
26.	Pithora dada Mandir, Ler Village 23°10'23"N, 69°46'5" E	Temple
27.	Land of Lakhond Village 23°15'12"N, 69°46'41" E	Land Reclamation
28.	Adjacent site of site no. 28, Land of Lakhond Village 23°15'10.94" N, 69°46'44.77"	Land Reclamation
29.	On Government Land, Padhdhar Village 23°14'29" N, 69°48'44" E	Land Reclamation
30.	B/h. Mangal Mandir School, Village Bhujodi 23°13'45.11" N, 69° 44'8.96" E	Land Reclamation
31.	Behind Lehriya Hanuman Temple, Kukma Village 23°13'21" N, 69°46'21" E	Backfilling in Abandoned Mines
32.	Beside old Hot Mix plant, Kukma Village 23°13'20" N, 69°46'3" E	
33.	Behind khatri mills, Beside of above site, Traverse, Government land, Kukma Village 23°13'20" N, 69°45'58" E	
34.	Village Lakhond 23°15'39" N, 69°47'17" E	



### SUMMARY FOR STATUS GYPSUM SITE RESTORATION

- As informed by the client Site nos. 1-21 have been cleared completely.
- Site no. 22 is a sewage line where in Gypsum has been used for leveling and it gives structural support for sewerage line passing.
- Site nos. 23 is an agricultural site where in crops viz. Castor Beans and Cotton, are growing and Gypsum is being used as a soil conditioner and also at Site nos. 24, Neem & Gulmahor are growing and Gypsum is being used as a soil conditioner.
- At Site nos. 25 there is construction of Gowshala and Cow Shed and at site no. 26, Temple is there so the unit could not remove Gypsum.
- In site nos. 27-30, Gypsum has been used to level land and it has become integral part, therefore difficult to lift.
- Site nos. 31-34 are abandoned mines wherein Gypsum has been utilized for backfilling as per EC conditions. It is pertinent to note that as per EC condition **SEIAA / GUJ / EC / 2(b) / 497 / 2016** Gypsum could be utilized in backfilling of abandoned mines.



## 2.2 PRODUCTION DETAILS:

The unit is manufacturing bleaching clay since 2001. The production details are shown hereunder in **Table No. 2.2**.

**TABLE: 2.2**  
**PRODUCTION DETAIL**

Sr. No.	Product Name	Production (t/Month)
1	Bleaching Clay	12000

Copy of CCA is attached as an **Annexure-1.1**.

## 2.3 MANUFACTURING PROCESS DETAILS

Bleaching clay is manufactured from the best quality, selectively mined and scientifically blended under stringent process controls. Bentonite and Sulphuric acid are main raw material and mainly five steps are involved in production of Acid Activated Bleaching clay are: [A] Granulation Section, [B] Acid Activation, [C] Drying, [D] Pulverization, [E] Neutralization & Filtration.

Bentonite is charged in hopper and send to crusher for crushing then it is sent to granulator. These granules are then carried to desired reactor in acid activation plant. In acid activation operation required concentration of Sulphuric acid is prepared in the selected reactor, it continues for 12 – 14 hours. After completion of acid activation, granules are washed away with water. The first hour drain is collected as spent acid which is send to IFFCO for utilization. Activated granules are discharged in bin storage area for subsequent drying process. Wet granules are fed in Rotary-Dryer. Dried granules at outlet of dryer are stored in hoppers from where it is transferred to mill hopper. Material is continuously fed by rotary valve to pulverization Mill. Pulverized material from mill is collected in storage hopper and packing done as per the requirement

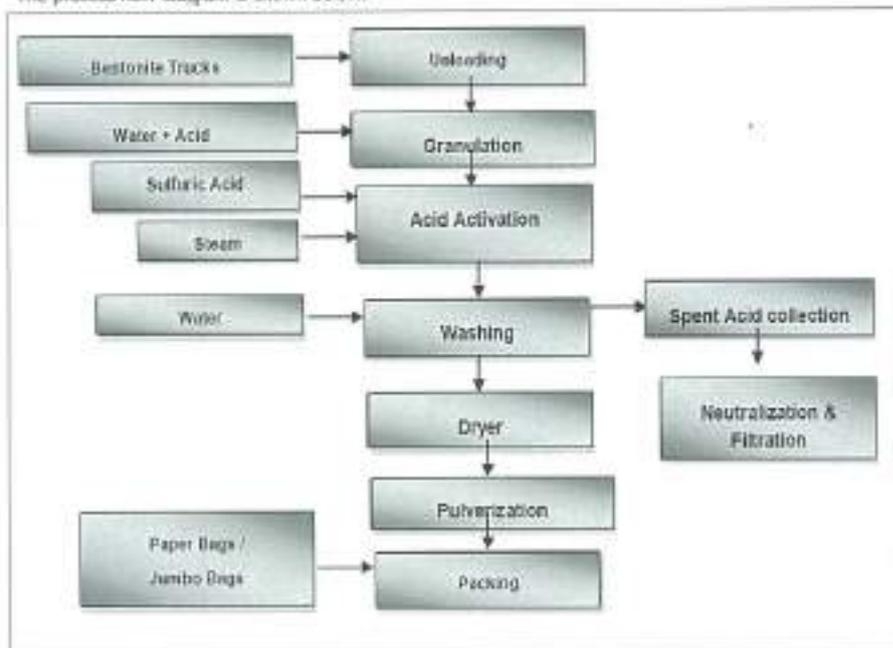
Bleaching Earth is an active adsorbent used for the general purpose of refining of edible and non-edible oil.

The process flow diagram is shown in **Figure No. 2.1:**



Figure No. 2.1  
Process Flow Diagram of Bleaching Earth

The process flow diagram is shown below:



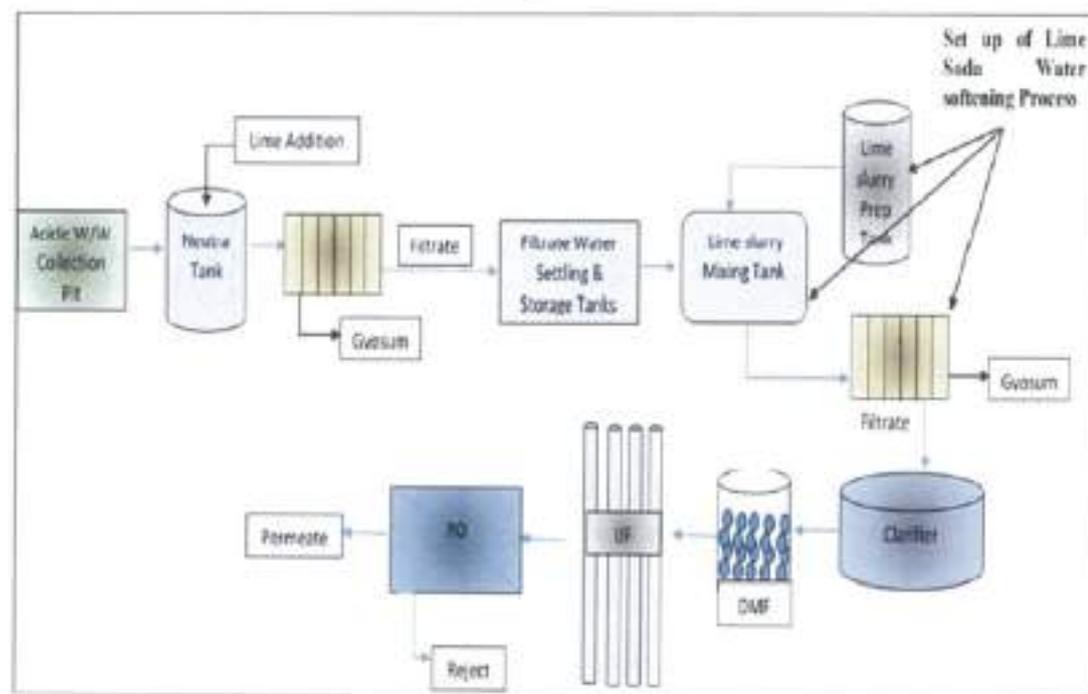
## 2.4 EFFLUENT TREATMENT PLANT:

After completion of acid activation process, acidic wastewater is carried to neutralization tank by pump. For neutralization, where lime is added to reactor. Then it is circulated by means of agitator in reactor for getting 7 pH. The total cycle time is 6-7 hours; after the neutralization process, the slurry is transferred to filter press by means of high-pressure pump. Gypsum which will remain in clothes of press is removed manually and transferred to storage area for sun drying. To increase water recycling and remove hardness the unit carried out soda lime softening process; by addition of lime slurry, filtrate water pH will rise to 11 so hardness will be removed and excess sulphate will precipitate. This slurry is sent to filter press where filtrate and Gypsum are separated. Filtrate is sent to clarifier where various dosing of soda ash, pH correction and polyelectrolyte is given. After proper settlement it is feed to ultra-filtration and dual media filter. Then it sent to RO operation where RO permeate water is reused in process and gardening and remaining RO reject water is sent to solar evaporation pond. The flow diagram is shown at **Figure No. 2.2**.

Gypsum is dried and is sent to cement industry for co-processing and/or sent for backfilling of exhausted/abandoned mines.

The unit had installed Sewage Treatment Plant of capacity 10 KLD to treat sewage generated from the unit. Treated Sewage water is used for gardening.

**Figure No. 2.2**  
**Flow Diagram of ETP**



## 2.5 GYP SUM -SOURCES & GENERATION

### 2.5.1 SOURCES OF GYP SUM GENERATION:

Gypsum is by-product and it is recovered from neutralization & filtration process & utilized in cement industry and backfilling of abandoned mines.

### 2.5.2 GENERATION, HANDLING & DISPOSAL OF GYP SUM:

The details of generation of the Gypsum is as follows:

#### GYP SUM GENERATION & MANAGEMENT:

1	Production (t/Month)	:	12000
2	Generation of Gypsum Sludge (t/year)	:	54000
3	Generation of Gypsum(kg/t)	:	375
4	Generation of Gypsum(t/day)	:	150
5	Consent / Authorization	:	Consolidated Consent & Authorization (CC&A) by Gujarat Pollution Control Board, vide Order No: AWH 93521 dated 11-06-2018, which is valid up to 24-06-2023 for manufacturing of Bleaching Clay and the same was amended vide order no. H-103222 dated 31/07/2019 and H-107040 date 05/03/2020 for alternate mode of Gypsum disposal. Copy of the same is attached as an <b>Annexure- 1.1</b> .
6	Mode of disposal	:	As per CCA Gypsum waste generated from neutralization of Spent Acid, shall be cement industry for co-processing. <b>And</b> Alternate mode of disposal of Gypsum waste generated from neutralization of spent acid, to mines for back filling, in the abandoned mines only when cement industries are not in operation and or not accepting the gypsum for co-processing.



7	Legal Status of Gypsum: :	<ul style="list-style-type: none"><li>• MoEF CC vide Letter No. F. No.23-161 / 2014 - HSMD has classified Gypsum as non-hazardous based on the analysis done by Pollucon Lab (MoEF Approved) for Schedule II parameters (as per HWM Rules 2008) in 2014; Letter of MoEF is enclosed vide <b>Annexure 2.1</b>.</li><li>• The unit has been granted Consolidated Consent &amp; Authorization (CC&amp;A) by Gujarat Pollution Control Board, vide Order No: AWH 93521 dated 11-06-2018, which is valid up to 24-06-2023 for manufacturing of Bleaching Clay and the same was amended vide order no. H-103222 dated 31/07/2019 and H-107040 date 05/03/2020 for alternate mode of disposal of Gypsum waste generated from neutralization of spent acid, mines for back filling, in the abandoned mines only when cement industries are not in operation and or not accepting the gypsum for co-processing.</li></ul>
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## 3.0 SITE ASSESSMENT

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### 3.1 LOCATION & EXTENT OF THE AREA

M/s. Ashapura Perfoclay Ltd. plant is located at Survey No. 167, Village: Ler, Nr. Bhujodi, Tal: Bhuj-Kutch. It is situated near Bhujodi off Anjar Bhuj Highway just 10 km from Bhuj.

### 3.2 PHYSIOGRAPHY & DRAINAGE

Geo-morphologically in and around the present site the ground is undulating. The streams flowing in and around the study area are ephemeral and originate from the central high portion and in general surface water flows from South to North.

### 3.3 CLIMATE

The climate of this area is dry and pleasant. The day temperature in the coastal parts, in general, is less than in the interior parts in summer. The climate is characterized by four seasons viz summer, monsoon autumn and winter. The summer season begins from March and extends up to May. The south west monsoon season begins from the month of June and lasts up to September. October and November are the post monsoon constituting the autumn season. A period from December to February is the winter season. After February, the temperature rapidly increases till month of May which is generally the hottest month.

The maximum temperature recorded in and around study area was 42° C, while the lowest temperature was 10°C.

In general, humidity in the coastal part is high throughout the year. Exceeding 60 percent on an average. During the monsoon the humidity of air in general is high with relative humidity exceeding 80 percent in coastal region and over 65 in the interior.

The evaporation and evapo-transpiration losses in and around the study area is fairly high i.e. 300 cm/year

### 3.4 RAINFALL

The rain fall is erratic both with respect space and time. Rainfall occurs in stormy pattern resulting in the bulk of the runoff flowing down the Sea or the Rann. Thunder storms occur during the monsoon season. Dust storms occur occasionally during summer particularly in the interior of the district.

The study area receives rainfall mainly from the south west monsoon. The rainfall in the other season is practically negligible.



### 3.5 GEOLOGY

Geologically, the oldest rocks exposed in Kutchh are the sedimentary rocks of middle Jurassic age existing uncomfortably upon these rocks are Infra-Trappean beds containing soft, coarsely stratified clayey and sandy rocks. Deccan Trap rest 'conformably over the Mesozoic or the Infra- Trappean beds. The lava After the Deccan Trap eruption were concluded, thin gypsies' aluminous clayey sediments, on the fringes of the lava flows were deposited. These have been late raised and are the main source of Bauxite. The tertiary rocks crop out all along the coast of Kachchh. The older marine rocks are more or less confined to the west and south-west while the younger fresh rocks occur in south and east. To meet this growing water demand for domestic, agriculture and industrial water supply has imposed stress on ground water development, which has been well reflected in the water level behavior in this district (Plate).

### 3.6 HYDROGEOLOGY

Ground water is the only the single dependable source for both irrigation and domestic water supply. Irrigation is the single largest user consuming over 90 per cent of the water being presently used.

There are several formations which contain saline water both in shallow as well as deep aquifers. As a result, recharge does not therefore necessarily add to the fresh ground water reservoirs.

Fresh ground water resources are mainly contained in the Central High Land, in sandstone / shale formations. The Bhuj stage of Umia series constitutes the most productive aquifers. Fresh water yields are available from aquifers from 25 m to 150 m deep. The yield varies from 10000 to 15000 GPH (45 m<sup>3</sup> to 70 m<sup>3</sup> approximately) The basalt and laterite support only dug wells with yields 6000 gallon Per day to 12000 gallon per day.

### 3.7 SOIL

The soils found in this area mostly Residual Sandy soils. The Residual Sandy soils have developed in-situ from the parent material originated from red sandstone and shale and are found over the areas underlain by Bhuj Sandstone. All these residual soils are shallow in depth. They are reddish brown in colour with fine weak granular structure to poorly developed one. These soils are sandy to loamy sand in texture dominated by coarse sand. These are non-calcareous, neutral to alkaline in reaction with poor base saturation. They are affected due to salt accumulation. From fertility point of view, they are poorly supplied with plant nutrients and, as such, support the crops with short duration and less water requirement.



### 3.8 AGRICULTURE

The major field crops grown in the district are Bajra, Green gram, Castor, Groundnut, Cotton, Wheat and Moth bean, except wheat all other crops are grown in kharif and are rainfed. Many horticulture crops including vegetables and fruit are grown in the district. For last few years good quality Dates are grown in the district.

### 3.9 LAND USE

The land use of the study area is mainly dominated by agriculture fallow land followed by scrub land and settlements (both urban and rural). As the area falls in arid zone, water body are scarce.

### 3.10 TOPOGRAPHY

The topography of the area near the project site is plain terrain toward Northern direction of the site and hilly in southern direction. Study area is undulating. The elevation of the project site and surrounding area varies from 120 - 131 m above the mean sea level.



## 4.0 SAMPLING, ANALYSIS & ASSESSMENT IN & AROUND 13 GYPSUM SITES (GYPSUM, SOIL & GROUND WATER)

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### 4.1 STUDY AREA

To assess the impact from identified 13 sites from where lifting of Gypsum is not possible, following samples were collected from in and around sites viz:

- Two soil samples (one virgin & one from site) at each Gypsum site.
- Ground Water samples from in and around 13 Gypsum sites.
- One Gypsum Sample at each site.



## 4.2 SAMPLING & ANALYSIS

### 4.2.1 METHODOLOGY OF SAMPLING - GYPSUM SAMPLE

Gypsum sample was collected at each identified 13 sites. The following steps were undertaken for the collection of Gypsum sample.

- Prior to sample collection, the existing gypsum inside the area was visually inspected.
- Upon completion of the visual inspection, ten (10) random sample collection locations were identified and safe access to the locations was assessed.
- Clean and decontaminated shovel was used to scoop the samples from the stock pile. Ten (10) random samples of almost same size were collected.
- Each random sample was put in zip-lock bag that was marked with unique sample identification no. and date of collection. Upon completion of collection of random samples, all the ten (10) portions were unloaded on a clean polythene sheet.
- The material was manually mixed thoroughly until the appearance of the mixed material was apparently homogeneous.
- The visual observation of the characteristics of the composite sample was recorded in the field note.
- Properly packed and contained samples were transfer to the laboratories for analysis.

#### 4.2.1.1 ANALYSIS OF GYPSUM:

- The heavy metals in Gypsum samples were analyzed for the parameters listed in the Schedule II-Class A of HW Rules 2016 by Toxicity Characteristic Leaching Procedure (TCLP) test for twelve (12) priority metals such as antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, through Detox Corporation Pvt. Ltd. Lab Division (MoEF Recognized and NABL Accredited Laboratory), Surat, Gujarat. The copy of the same is attached as an **Annexure- 4.1**.
- The Gypsum samples were also analyzed for a pH, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub> and Gypsum content. The method of analysis is presented at **Table No 4.1** and analysis report are presented and discussed at relevant site assessment.



**Table No. 4.1**  
**Methodology of Testing of Gypsum Samples**

Sr. No.	Parameters	Unit	Name of method
1	SiO <sub>2</sub>	%	EPA 3050 B (Dec 1996 Rev 2)
2	Al <sub>2</sub> O <sub>3</sub>	%	
3	Fe <sub>2</sub> O <sub>3</sub>	%	
4	Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O	%	IS: 1288:1992
<b>TCLP Parameters</b>			
5	Lead	mg/l	USEPA:1313
6	Cadmium	mg/l	USEPA:1313
7	Mercury	mg/l	USEPA:1313
8	Chromium	mg/l	USEPA:1313
9	Arsenic	mg/l	USEPA:1313
10	Selenium	mg/l	USEPA:1313
<b>STLC Parameters</b>			
11	Copper	mg/l	Title 22, CCR, Sec-66261 Appendix II
12	Nickel	mg/l	Title 22, CCR, Sec-66261 Appendix II
13	Antimony	mg/l	Title 22, CCR, Sec-66261 Appendix II
<b>DW Extract Parameters</b>			
14	Ammonia	mg/l	APHA 23 <sup>rd</sup> Edition 4500 NH <sub>3</sub> , B & C
15	Cyanide	mg/l	APHA 23 <sup>rd</sup> Edition 4500 CN , E



## 4.2.2 METHODOLOGY OF SAMPLING - SOIL SAMPLE

1. During field visit top soil cover was studied by visual observation before collecting actual soil samples.
2. Variations in colour, texture were noticed during the field visit.
3. Two soil samples were collected, one soil sample from just near to the site (<5 m) and another virgin sample away from the site (30 to 50 mts.).
4. Soil samples were collected at the depth of 2 meter. Soil samples were collected with the help of JCB and labeled.
5. The samples were put in zip-lock bag that were marked with unique sample identification nos. and date of collection.
6. All the soil samples were carefully transported to laboratory.
7. The visual observation of the characteristics of the sample was recorded in the field note.

### 4.2.2.1 Analysis of Samples- Soil Sample

- The soil parameters that were analyzed and method of analysis is presented below in **Table No. 4.2**. The relevant analysis reports are presented and discussed at site assessment.



**Table No. 4.2**  
**Methodology of Testing of Soil Samples**

Soil Parameters	Method name	
Moisture	IS 2720 : Part 9 :1992	
pH	As per methods specified in "Methods Manual, Soil Testing in India, Department of Agriculture and Co-operation Ministry of Agriculture, GOI.	
Conductivity		
Calcium		
Sodium		
Potassium		
Ammonia		
Nitrate		
Sulphate		
Zinc		5 % Acid Leachate to be made and analyzed by using instrument ICP-OES.
Copper		
Nickel		
Chromium		
Cadmium		
Lead		
Manganese		
Cobalt	SOP DCPL / SO / Gypsum contain / 031, Date 01-01-2020	
Gypsum as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$		



### 4.3 METHODOLOGY OF SAMPLING & ANALYSIS - GROUND WATER

At each identified location site maximum available ground water samples were collected, based on availability of sample nearby the site.

Grab samples were collected during our visit. For the collection, preservation and analysis, APHA/IS methods were followed. The requisite procedures, laid down in APHA/IS methods, were adopted for preserving the samples with suitable preservative chemicals. Ground water samples were analyzed for Physical and Chemical parameters listed in **Table No. 4.3**. The relevant analysis reports are presented and discussed at site assessment.

**Table No. 4.3**  
**Details of Reference Method for Water Analysis**

Parameters	Range of Measurement	Method Reference
pH @ 25° C	2.0 to 12.0	IS 3025, Part-11 RA: 2017
Color, (Pt. Co. Unit)	5-500	APHA 23 <sup>rd</sup> Edt <sup>n</sup> . 2120 C: 2017
EC, (mS/cm)	0.001 to 200	APHA 23 <sup>rd</sup> Edt <sup>n</sup> . 2510 B: 2017
Total Hardness, (mg/L)	2-5000	APHA 23 <sup>rd</sup> Edt <sup>n</sup> . 2320 C: 2017
TDS, (mg/L)	5- 50000	APHA 23 <sup>rd</sup> Edt <sup>n</sup> . 2540 C: 2017
COD, (mg/L)	4-10000	APHA 23 <sup>rd</sup> Edt <sup>n</sup> . 5220 B: 2017
BOD @ 3 Days 27°C, (mg/L)	2-1800	IS 3025, Part-44 RA: 2014
Chloride, (mg/L)	0.5-50000	APHA 23 <sup>rd</sup> Edt <sup>n</sup> . 4500 Cl <sup>-</sup> B: 2017
Sulphates, (mg/L)	1-10000	APHA 23 <sup>rd</sup> Edt <sup>n</sup> . 4500 SO <sub>4</sub> <sup>-2</sup> E:2017
Ammonical Nitrogen, (mg/L)	0.2 - 280	APHA 23 <sup>rd</sup> Edt <sup>n</sup> . 4500NH <sub>3</sub> , C:2017
Iron, (mg/L)	0.01-50.00	APHA 23 <sup>rd</sup> Edt <sup>n</sup> . 3500 Fe B: 2017
Zinc, (mg/L)	0.2-7.0	APHA 23 <sup>rd</sup> Edt <sup>n</sup> . 3500 Zn B: 2017
Total Chromium, (mg/L)	0.01-30.00	APHA 23 <sup>rd</sup> Edt <sup>n</sup> . 3500 Cr B: 2017
Fluoride, (mg/L)	0.1-10.00	APHA 23 <sup>rd</sup> Edt <sup>n</sup> . 4500 F <sup>-</sup> D: 2017
Nitrate, (mg/L)	0.1-7.0	APHA 23 <sup>rd</sup> Edt <sup>n</sup> . 4500 NO <sub>3</sub> B: 2017
Calcium, (mg/L)	2-5000	APHA 23 <sup>rd</sup> Edt <sup>n</sup> .3500 Ca B:2017
Magnesium, (mg/L)	2-1200	APHA 23 <sup>rd</sup> Edt <sup>n</sup> .3500 Mg B:2017
Sodium, (mg/L)	1-10000	APHA 23 <sup>rd</sup> Edt <sup>n</sup> . 3500 Na B: 2017
Potassium, (mg/L)	1-10000	APHA 23 <sup>rd</sup> Edt <sup>n</sup> . 3500 K B: 2017
Sulfide, (mg/L)	0.2 - 100	APHA 23 <sup>rd</sup> Edt <sup>n</sup> . 4500 S <sup>-2</sup> F:2017
Lead, (mg/L)	0.005-100	IS 3025: Part 47:1994
SAR	--	Calculation method



## 4.4 SITE ASSESSMENT

### 4.4.1 S1/22- Beside Kukma- Lakhond, Village Road

<b>Location</b>	: <b>Beside Kukma- Lakhond, Village Road</b>  Latitude : 23°13'28.55"N, Longitude: 69°46'43.28"E <b>To</b> Latitude : 23°13'53.41"N, Longitude: 69°46'50.85"E
<b>Site Details:</b>	: Laid on the sides of public Infrastructure (sewage line) at Kukma to Lakhond Road. Please refer Photograph of site presented at <b>Figure No 4.1.</b>
<b>Google Image</b>	: Site location map along with sample location is presented at <b>Figure No. 4.2.</b>
<b>Gypsum Analysis</b>	: Analysis report is presented at <b>Table No. 4.4</b>  The above table indicates that the Gypsum content is 63.58 and pH is 7.74.  The heavy metals concentration as per TCLP and STLC as specified in the Schedule - II - Class A, of Hazardous and Other Waste (Management and Transboundary Movement) Rules (2016), indicates that concentration of Metals is well within limit.  It may be noted that Gypsum has been removed from the Hazardous Waste category by MoEF and it is categorized as non-hazardous.
<b>Soil Analysis</b>	: Soil analysis report is presented at <b>Table No. 4.5</b>  As shown in above table, the soil sample was taken adjacent to the Gypsum site. It indicates slightly elevated levels of mineral contents viz. Ca, K, SO <sub>4</sub> , and Sodium compared to the virgin soil. This could be due to adjacent Gypsum site. It will not have any detrimental effect on the surrounding soil quality as these are primary and secondary major plant



		nutrients.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.
<b>Ground Water Analysis</b>	:	No ground water sample was available in vicinity of the site.
<b>Impact Assessment w.r.t. Soil and Ground Water</b>	:	The analysis result of soil indicates that due to the Gypsum there is no adverse impact on nearby soil.

Note:(\*) As per screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines" Guidance document for assessment and remediation of contaminates sites in India, 2015".



**Figure No. 4.1**  
**Photographs of Site and Sampling of**  
**Site-S1/22 – Beside Kukma–Lakhond Village Road**



**Figure No. 4.2**  
**Site Location Map with Gypsum, Soil and water Sample of**  
**Site-S1/22–Beside Kukma–Lakhond Village Road**



S1/22 G	Gypsum Composite Sample
S1/22 C	Soil Sample near Gypsum site
S1/22 B	Virgin Soil Sample near Gypsum site area
Latitude : 23°13'28.55"N, Longitude: 69°46'43.28"E	
To	
Latitude : 23°13'53.41"N, Longitude: 69°46'50.85"E	



**Table No. 4.4**  
**Gypsum Analysis Report- Site S1/22-Beside Kukma- Lakhond Village Road**

Parameters	Site No. S1/22 Gypsum sample at 1ft Depth Sewage Line at Kukma - Lakhond Road	
	Lat: 23°13'30.66"N	Long: 69°46'43.41"E
pH	7.74	
SiO <sub>2</sub> , %	0.221	
Al <sub>2</sub> O <sub>3</sub> , %	1.074	
Fe <sub>2</sub> O <sub>3</sub> , %	15.725	
Gypsum as CaSO <sub>4</sub> . 2H <sub>2</sub> O, %	63.58	
<b>TCLP Parameters</b>		
Lead, mg/l	BDL	
Cadmium, mg/l	BDL	
Mercury, mg/l	BDL	
Chromium, mg/l	BDL	
Arsenic, mg/l	BDL	
Selenium, mg/l	BDL	
<b>STLC Parameters</b>		
Copper, mg/l	0.382	
Nickel, mg/l	1.746	
Antimony, mg/l	BDL	
<b>D/W Extract Parameters</b>		
Ammonia, mg/l	BDL	
Cyanide, mg/l	BDL	



**Table No. 4.5**  
**Soil Analysis Report- Site S1/22–Beside Kukma- Lakhond Village Road**

Parameters	Site No. S1/22 soil sample at 2 mt Depth Sewage Line at Kukma – Lakhond Road-2 mt away from Site		Site No.S1/22 soil sample for Reference- 40 mt away from Site	
	Lat: 23°13'32.13"N	Long: 69°46'43.63"E	Lat: 23°13'32.41"N	Long: 69°46'42.38"E
Moisture %	3.12		4.50	
pH	7.92		8.10	
Conductivity, mS/cm	2.140		0.870	
Calcium, g/kg	5.05		4.08	
Sodium, g/Kg	12.4		4.4	
Potassium, g/Kg	5.6		1.6	
Sulphate, g/Kg	3.89		0.41	
Ammonia, g/Kg	0.020		0.011	
Copper, g/Kg	0.06		0.03	
Nickel, g/Kg	0.05		0.03	
Zinc, g/Kg	0.09		0.04	
Cadmium, g/Kg	BDL		BDL	
Lead, g/Kg	0.013		0.010	
Chromium, g/Kg	0.07		0.06	
Manganese, g/Kg	0.54		0.40	
Cobalt, g/Kg	0.020		0.013	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL		BDL	



#### 4.4.2 S2/23 - Natural drain between farm of Dinesh Maharaj and Govind Vankar, Kukma Village

Location	:	<p>Natural drain between farm of Dinesh Maharaj and Govind Vankar, Kukma Village</p> <p>Latitude : 23°11'56.27"N Longitude : 69°46'47.43"E</p>
Site Details:	:	<ul style="list-style-type: none"> <li>• Crops are growing viz. Castor Beans, where Gypsum is laid, as well as used as a soil conditioner.</li> <li>• Construction work is going on in adjacent areas.</li> <li>• The Gypsum is laid on the bund wall of the farm.</li> <li>• Please refer <b>Figure No. 4.3</b> for Photographs of same.</li> </ul>
Google Image	:	<p>Site location map is presented along with sampling locations at <b>Figure No. 4.4</b>.</p>
Gypsum Analysis	:	<p>Analysis report is presented at <b>Table No. 4.6</b></p> <p>The above table indicates that the Gypsum content is 64.18 and pH is 8.05.</p> <p>The heavy metals concentration as per TCLP and STLC as specified in the Schedule-II Class A, of Hazardous and Other Waste (Management and Transboundary Movement) Rules (2016), indicates that concentration of Metals is well within limit.</p> <p>It may be noted that Gypsum has been removed from the Hazardous Waste category by MoEF and it is categorized as non-hazardous.</p>



<b>Soil Analysis</b>	:	<p>Analysis report is Presented at <b>Table No. 4.7.</b></p> <p>The above table indicates that the quality of soil near the Gypsum site is at par with virgin soil.</p> <p>Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.</p>
<b>Ground Water Analysis</b>	:	<p>Analysis report is presented at <b>Table No. 4.8</b></p> <p>The above table indicates that concentration of all the major parameters is at par with the water standards IS: 10500.</p> <p>The TDS and Hardness are at par with the ground water quality of the area.</p>
<b>Impact Assessment w.r.t. Soil and Ground Water</b>	:	<p>The analysis results of soil and ground water indicates that due to the Gypsum there is no adverse impact on nearby Soil and Ground Water Quality.</p>

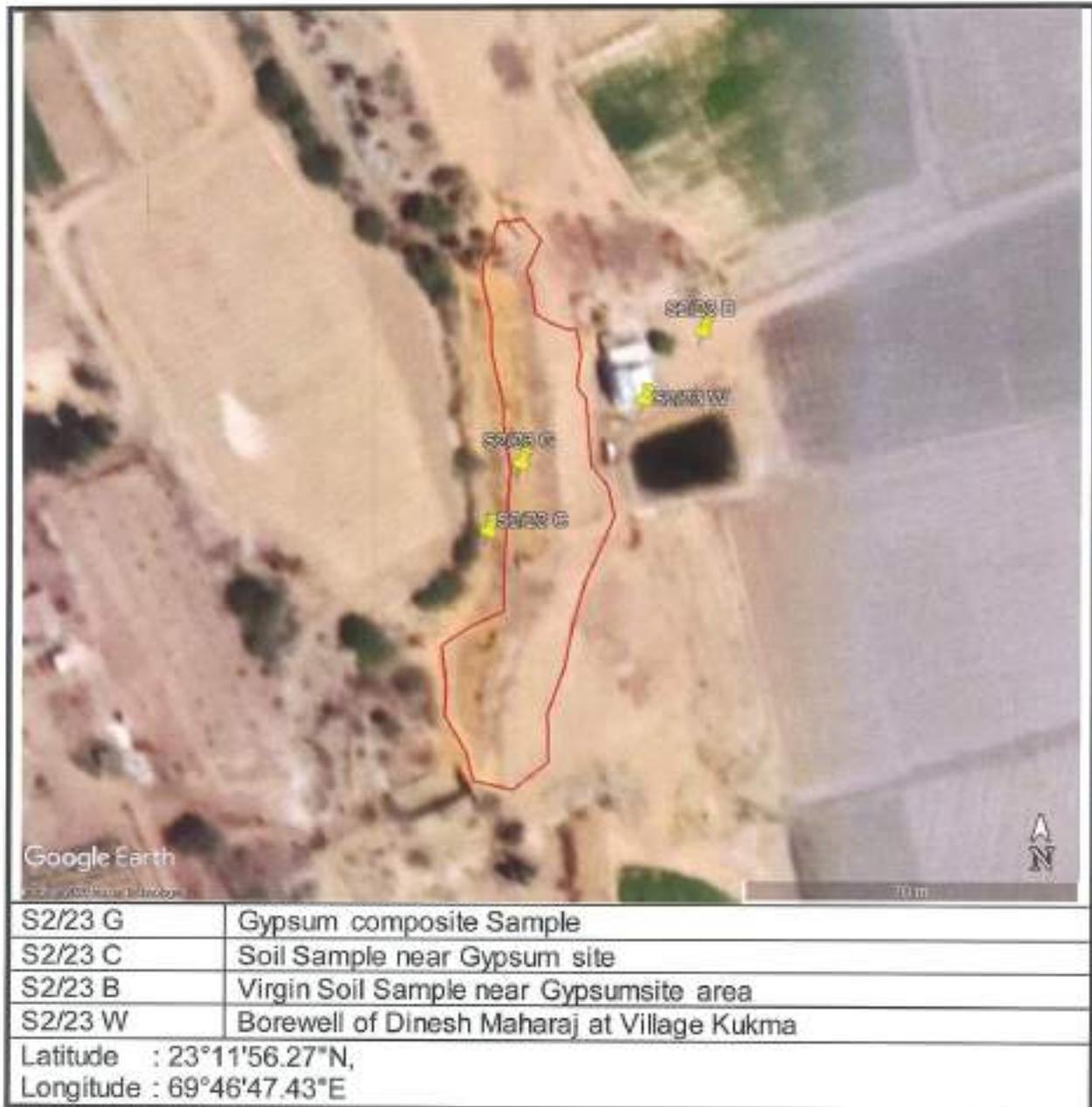
Note:(\*) As per screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines" Guidance document for assessment and remediation of contaminates sites in India, 2015".



**Figure No. 4.3**  
**Photographs of Site and Sampling of**  
**Site-S2/23 - Natural drain between farm of Dinesh Maharaj and Govind Vankar,**  
**Kukma Village**



**Figure No. 4.4**  
**Site Location Map with Gypsum, Soil and water Sample of**  
**Site-S2/23 - Natural drain between farm of Dinesh Maharaj and Govind Vankar,**  
**Kukma Village**



**Table No. 4.6**  
**Gypsum Analysis Report- Site S2/23-**  
**Natural drain between farm of Dinesh Maharaj and Govind Vankar, Kukma**  
**Village**

Parameters	Site No. S2/23 Gypsum sample at Natural drain between farm of Dinesh maharaj and Govind vankar, Kukma village	
	Lat: 23°11'56.29"N	Long: 69°46'47.12"E
pH	8.05	
SiO <sub>2</sub> , %	0.19	
Al <sub>2</sub> O <sub>3</sub> , %	0.892	
Fe <sub>2</sub> O <sub>3</sub> , %	14.167	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	64.18	
<b>TCLP Parameters</b>		
Lead, mg/l	BDL	
Cadmium, mg/l	BDL	
Mercury, mg/l	BDL	
Chromium, mg/l	BDL	
Arsenic, mg/l	BDL	
Selenium, mg/l	BDL	
<b>STLC Parameters</b>		
Copper, mg/l	0.118	
Nickel, mg/l	1.399	
Antimony, mg/l	BDL	
<b>D/W Extract Parameters</b>		
Ammonia, mg/l	BDL	
Cyanide, mg/l	BDL	



**Table No. 4.7**  
**Soil Analysis Report- Site S2/23-**  
**Natural drain between farm of Dinesh Maharaj and Govind Vankar, Kukma**  
**Village**

Parameters	Site No. S2/23 soil sample at 2 mt Depth Near Dinesh Maharaj Farm, Kukma Village 2 mt away from site		Site No. S2/23 soil sample for Reference 30 mt away from site	
	Lat: 23°11'55.83"N	Long: 69°46'46.88"E	Lat: 23°11'57.19"N	Long: 69°46'48.45"E
Moisture %	3.36		5.12	
pH	8.57		8.60	
Conductivity, mS/cm	0.265		0.210	
Calcium, g/kg	4.09		4.09	
Sodium, g/Kg	2.4		2.0	
Potassium, g/Kg	0.6		0.4	
Sulphate, g/Kg	0.30		0.28	
Ammonia, g/Kg	0.020		0.010	
Copper, g/Kg	0.034		0.039	
Nickel, g/Kg	0.029		0.025	
Zinc, g/Kg	0.10		0.07	
Cadmium, g/Kg	BDL		BDL	
Lead, g/Kg	0.01		0.01	
Chromium, g/Kg	0.03		0.03	
Manganese, g/Kg	0.40		0.36	
Cobalt, g/Kg	0.02		0.02	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL		BDL	



**Table No. 4.8**  
**Ground Water Analysis Report- Site S2/23- Borewell of Dinesh Maharaj, Kukma Village**

Parameter	Unit	Site No.S2/23Borewell of Dinesh maharaj, Kukma Village 10 mt away from site
		Lat: 23°11'56.90"N, Long: 69°46'48.43"E
pH @ 25 °C	--	7.05
Color	pt. Co	BDL
EC	mS/cm	2.586
Total Hardness	mg/L	640
TDS	mg/L	1792
COD	mg/L	BDL
BOD	mg/L	BDL
Chloride	mg/L	630
Sulphates	mg/L	413
Ammonical nitrogen	mg/L	0.34
Iron	mg/L	BDL
Zinc	mg/L	0.82
Total Chromium	mg/L	BDL
Fluoride	mg/L	1.31
Nitrate	mg/L	0.76
Calcium	mg/L	84.1
Magnesium	mg/L	104.4
Sodium	mg/L	176
Potassium	mg/L	72
SAR	%	3.03
Lead	mg/L	BDL
Sulphide	mg/L	BDL



## 4.4.3 S3/24- Shri Vankal mata Mandir

Location	: <b>Shri Vankal mata Mandir</b>  Latitude : 23°13'35.44"N, Longitude: 69°44'41.32"E
Site Details:	: <ul style="list-style-type: none"> <li>• Plantation i.e. Neem, Gulmahor etc are growing, where Gypsum is used as a soil conditioner.</li> <li>• Please refer <b>Figure No 4.5</b> for Photographs of same.</li> </ul>
Google Image	: Site location map along with sampling locations is presented as <b>Figure No. 4.6.</b>
Gypsum Analysis	: Analysis report is presented at <b>Table No. 4.9.</b>  The above table indicates that the Gypsum content is 66.7 and pH is 8.12.  The heavy metals concentration as per TCLP and STLC as specified in the Schedule -II - Class A, of Hazardous and Other Waste (Management and Transboundary Movement) Rules (2016), indicates that concentration of Metals is well within limit.  It may be noted that Gypsum has been removed from the Hazardous Waste category by MoEF and it is categorized as non-hazardous.
Soil Analysis	: Analysis report is presented at <b>Table No. 4.10</b>  The above table indicates that the quality of soil near the Gypsum site is at par with virgin soil.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.



<b>Ground Water Analysis</b>	<p><b>Water :</b> Analysis report presented at <b>Table No. 4.11</b></p> <p>The above table indicates that concentration of all the major parameters is at par with the water standards IS: 10500.</p> <p>The TDS and Hardness are at par with the ground water quality of the area.</p>
<b>Impact Assessment w.r.t. Soil and Ground Water</b>	<p><b>:</b> The analysis results of soil and ground water indicates that due to the Gypsum there is no adverse impact on nearby soil and Ground Water Quality.</p>

Note:(\*) As per screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines" Guidance document for assessment and remediation of contaminates sites in India, 2015".



**Figure No 4.5**  
**Photographs of Site and Sampling of**  
**Site-S3/24 - Shri Vankal mata Mandir**



**Figure No. 4.6**  
**Site Location Map with Gypsum, Soil and water Sample of**  
**Site-S3/24 - Shri Vankal mata Mandir**



S3/24 G	Gypsum composite Sample from 10 Different Location
S3/24 C	Soil Sample near Gypsum site
S3/24 B	Virgin Soil Sample near Gypsum site area
S3/24 W	Borewell at Shri Vankal mata Temple, Village Bhujodi
Latitude	: 23°13'35.44"N
Longitude	: 69°44'41.32"E



**Table No. 4.9**  
**Gypsum Analysis Report- Site S3/24-Shri Vankal mata Mandir**

Parameters	Site No. S3/24 Gypsum sample near Shri Vankal mata temple, Bhujodi village	
	Lat: 23°13'35.05"N	Long: 69°44'40.50"E
pH	8.12	
SiO <sub>2</sub> , %	0.094	
Al <sub>2</sub> O <sub>3</sub> , %	0.822	
Fe <sub>2</sub> O <sub>3</sub> , %	12.179	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	66.7	
<b>TCLP Parameters</b>		
Lead, mg/l	BDL	
Cadmium, mg/l	BDL	
Mercury, mg/l	BDL	
Chromium, mg/l	BDL	
Arsenic, mg/l	BDL	
Selenium, mg/l	BDL	
<b>STLC Parameters</b>		
Copper, mg/l	0.447	
Nickel, mg/l	1.573	
Antimony, mg/l	BDL	
<b>D/W Extract Parameters</b>		
Ammonia, mg/l	BDL	
Cyanide, mg/l	BDL	



**Table No. 4.10**  
**Soil Analysis Report- Site S3/24-Shri Vankal mata Mandir**

Parameters	Site No. S3/24 soil sample Near Shri Vankal mata temple, Bhujodi Village - 2 mt away from Gypsum site		Site No. S3/24 soil Reference sample 25 mt away from site	
	Lat: 23°13'34.48"N	Long: 69°44'40.55"E	Lat:23°13'33.6 9"N	Long: 69°44'40.84"E
Moisture %	3.70		3.12	
pH	8.41		8.27	
Conductivity, mS/cm	0.371		0.291	
Calcium, g/kg	4.63		4.58	
Sodium, g/Kg	2.3		1.6	
Potassium, g/Kg	1.2		0.4	
Sulphate, g/Kg	0.31		0.28	
Ammonia, g/Kg	0.014		0.009	
Copper, g/Kg	0.02		0.02	
Nickel, g/Kg	0.01		0.02	
Zinc, g/Kg	0.04		0.04	
Cadmium, g/Kg	BDL		BDL	
Lead, g/Kg	0.01		0.01	
Chromium, g/Kg	0.02		0.03	
Manganese, g/Kg	0.12		0.16	
Cobalt, g/Kg	0.01		0.006	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL		BDL	



**Table No. 4.11**  
**Ground Water Analysis Report- Site S3/24-Shri Vankal mata Mandir**

Parameter	Unit	Site No. S3/24 Borewell at Madhapar gram panchayat Near Vankal mata temple, Bhujodi Village 75 mt away from site	
		Lat: 23°13'31.83"N	Long: 69°44'40.32"E
pH @ 25 °C	--	7.10	
Color	pt. Co	BDL	
EC	mS/cm	3.345	
Total Hardness	mg/L	880	
TDS	mg/L	2324	
COD	mg/L	BDL	
BOD	mg/L	BDL	
Chloride	mg/L	765	
Sulphates	mg/L	521	
Ammonical nitrogen	mg/L	0.22	
Iron	mg/L	BDL	
Zinc	mg/L	1.2	
Total Chromium	mg/L	BDL	
Fluoride	mg/L	0.92	
Nitrate	mg/L	3.96	
Calcium	mg/L	216.4	
Magnesium	mg/L	82.6	
Sodium	mg/L	198	
Potassium	mg/L	108	
SAR	%	2.90	
Lead	mg/L	BDL	
Sulphide	mg/L	BDL	



#### 4.4.4 S4/25- Vrundavan Gir Gaudham, Shree Swaminarayan Mandir, Besides Ashapura Colony, Bhachau Road

Location	: Vrundavan Gir Gaudham, Shree Swaminarayan Mandir, Besides Ashapura Colony  Latitude : 23°14'04.33"N, Longitude : 69°46'35.57"E
Site Details:	: <ul style="list-style-type: none"> <li>• Gypsum is used to level, the land of Gowshala of Swaminarayan Mandir and clay layer is laid over Gypsum layer.</li> <li>• Please refer <b>Figure No 4.7</b> for Photographs of same.</li> </ul>
Google Image	: Site location map along with sampling locations is presented as <b>Figure No. 4.8</b> .
Gypsum Analysis	: Analysis report is presented at <b>Table No. 4.12</b> .  The above table indicates that the Gypsum content is 68.5 and pH is 8.16.  The heavy metals concentration as per TCLP and STLC as specified in the Schedule -II - Class A, of Hazardous and Other Waste (Management and Transboundary Movement) Rules (2016), indicates that concentration of Metals is well within limit.  It may be noted that Gypsum has been removed from the Hazardous Waste category by MoEF and it is categorized as non-hazardous.
Soil Analysis	: Analysis report is Presented at <b>Table No. 4.13</b>  As shown in above table, the soil sample was taken adjacent to the Gypsum site. It indicates slightly elevated levels of mineral contents viz. Ca, K, SO <sub>4</sub> , and Sodium compared to the virgin soil. This could be due to adjacent Gypsum site. It will not have any detrimental effect on the surrounding soil quality as these are primary and secondary major plant

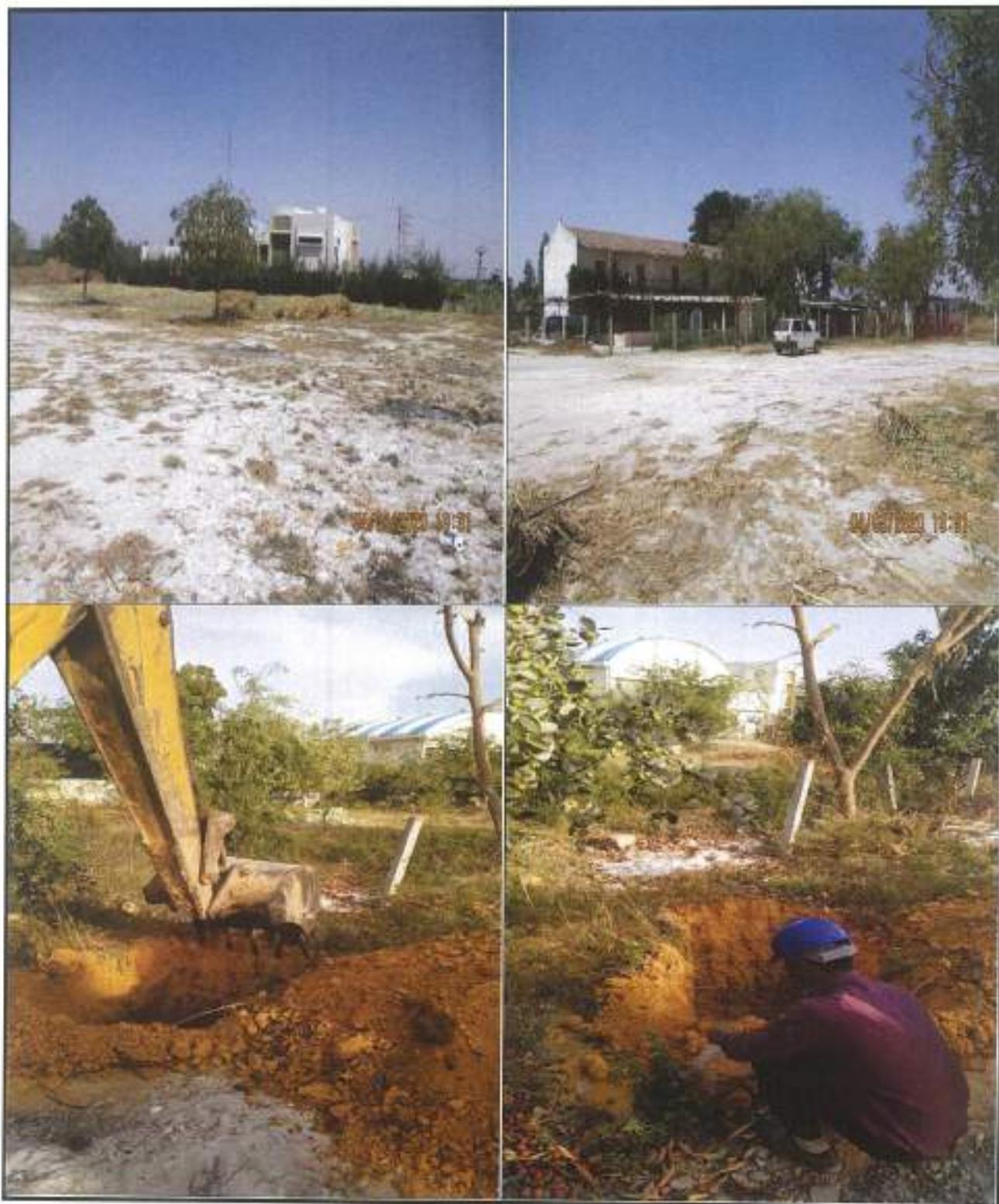


		<p>nutrients.</p> <p>Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.</p>
<b>Ground Water Analysis</b>	:	No ground water sample was available in vicinity of the site.
<b>Impact Assessment w.r.t. Soil and Ground Water</b>	:	The analysis result of soil indicates that due to the Gypsum there is no adverse impact on nearby soil.

Note:(\*) As per screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines" Guidance document for assessment and remediation of contaminates sites in India, 2015".



**Figure No. 4.7**  
**Photographs of Site and Sampling of**  
**Site- S4/25 Vrundavan Gir Gaudham, Shree Swaminarayan Mandir, Besides**  
**Ashapura Colony, Bhachau Road**



**Figure No. 4.8**  
**Site Location Map with Gypsum, Soil and water Sample of Site-S4/25**  
**Vrundavan Gir Gaudham, Shree Swaminarayan Mandir, Besides Ashapura**  
**Colony, Bhuj-Bhachau Road**



S4/25 G	Gypsum Sample from 10 Different Location
S4/25 C	Soil Sample near Gypsum site
S4/25 B	Virgin Soil Sample near Gypsumsite area
Latitude : 23°14'04.33"N,	
Longitude : 69°46'35.57"E	



Table No. 4.12

**Gypsum Analysis Report- Site S4/25-Vrundavan Gir Gaudham, Shree Swaminarayan Mandir, Besides Ashapura Colony, Bhachau Road**

Parameters	Site No. S4/25 Gypsum sample at Near Vrundavan Gir Gaudham Bhuj-Bhachau Road.	
	Lat: 23°14'4.05"N	Long: 69°46'35.31"E
pH	8.16	
SiO <sub>2</sub> , %	0.255	
Al <sub>2</sub> O <sub>3</sub> , %	0.769	
Fe <sub>2</sub> O <sub>3</sub> , %	13.929	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	68.5	
<b>TCLP Parameters</b>		
Lead, mg/l	BDL	
Cadmium, mg/l	BDL	
Mercury, mg/l	BDL	
Chromium, mg/l	BDL	
Arsenic, mg/l	BDL	
Selenium, mg/l	BDL	
<b>STLC Parameters</b>		
Copper, mg/l	0.860	
Nickel, mg/l	1.098	
Antimony, mg/l	BDL	
<b>D/W Extract Parameters</b>		
Ammonia, mg/l	BDL	
Cyanide, mg/l	BDL	



**Table No. 4.13**  
**Soil Analysis Report- Site S4/25-Vrundavan Gir Gaudham, Shree**  
**Swaminarayan Mandir, Besides Ashapura Colony, Bhachau Road**

Parameters	Site No. S4/25 soil sample at 2 mt Depth Near Vrundavan Gir Gaudham Bhuj-Bhachau Road 2 mt away from Gypsum site		Site No. S4/25 soil sample for Reference 60 mt away from Gypsum site	
	Lat: 23°14'4.05"N	Long: 69°46'35.31"E	Lat:23°14'5.86 "N	Long: 69°46'32.33"E
Moisture %	5.6		5.22	
pH	8.27		8.93	
Conductivity, mS/cm	1.441		0.475	
Calcium, g/kg	5.90		4.81	
Sodium, g/Kg	9.2		4.4	
Potassium, g/Kg	2.0		1.8	
Sulphate, g/Kg	2.96		0.31	
Ammonia, g/Kg	0.019		0.014	
Copper, g/Kg	0.05		0.03	
Nickel, g/Kg	0.03		0.02	
Zinc, g/Kg	0.06		0.05	
Cadmium, g/Kg	BDL		BDL	
Lead, g/Kg	0.01		0.01	
Chromium, g/Kg	0.04		0.04	
Manganese, g/Kg	0.31		0.23	
Cobalt, g/Kg	0.012		0.008	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL		BDL	



#### 4.4.5 S5/26- Pithoradada MandirLer Village

Location	: Pithoradada Mandir, Ler Village  Latitude : 23°10'23.18"N Longitude: 69°46'05.05"E
Site Details:	: <ul style="list-style-type: none"> <li>• The Gypsum is lied on the bund wall and give support of bundwall of temple. The same has been stone-pitched. The adjacent and beneath soil is hard rock.</li> <li>• Please refer <b>Figure No 4.9</b> for Photographs of same.</li> </ul>
Google Image	: Site location map along with sampling location is shown in <b>Figure No. 4.10.</b>
Gypsum Analysis	: Analysis report is presented at <b>Table No. 4.14</b>  The above table indicates that the Gypsum content is 60.4 and pH is 8.08.  The heavy metals concentration as per TCLP and STLC as specified in the Schedule -II - Class A, of Hazardous and Other Waste (Management and Transboundary Movement) Rules (2016), indicates that concentration of Metals is well within limit.  It may be noted that Gypsum has been removed from the Hazardous Waste category by MoEF and it is categorized as non-hazardous.
Soil Analysis	: Analysis report is Presented at <b>Table No. 4.15</b>  The above table indicates that the quality of soil near the gypsum site is hard rock. No contamination is observed.  Site soil sample are within the Screening and Responsive Level as specified by MoEF(*), it indicates that levels in site sample are below screening levels.



<b>Ground Water Analysis</b>	:	No ground water sample was available in vicinity of the site.
<b>Impact Assessment w.r.t. Soil and Ground Water</b>	:	The analysis result of soil indicates that due to the Gypsum there is no adverse impact on nearby soil quality.

Note:(\*) As per screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines" Guidance document for assessment and remediation of contaminates sites in India, 2015".



Figure No. 4.9.  
Photographs of Site and Sampling of  
Site-S5/26 – Pithoradada Mandir, Ler Village



**Figure No. 4.10**  
**Site Location Map with Gypsum, Soil and water Sample of**  
**Site-S5/26 – Pithoradada Mandir, Ler Village**



S5/26 G	Gypsum Sample from 10 Different Location
S5/26 C	Soil Sample near Gypsum site area
Latitude : 23°10'23.18"N	
Longitude: 69°46'05.05"E	





**Table No. 4.15**  
**Soil Analysis Report- Site S5/26-Pithoradada Mandir, Ler Village**

Parameters	Site No. S5/26 soil sample at 1 feet B/h Pithora dada Temple, Village Ler 5mt away from site	
	Lat: 23°10'24.79"N	Long: 69°46'3.79"E
Moisture %	4.56	
pH	8.63	
Conductivity, mS/cm	0.176	
Calcium, g/kg	3.21	
Sodium, g/Kg	2.0	
Potassium, g/Kg	0.4	
Sulphate, g/Kg	0.31	
Ammonia, g/Kg	0.014	
Copper, g/Kg	0.02	
Nickel, g/Kg	0.02	
Zinc, g/Kg	0.04	
Cadmium, g/Kg	BDL	
Lead, g/Kg	0.01	
Chromium, g/Kg	0.04	
Manganese, g/Kg	0.19	
Cobalt, g/Kg	0.009	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	



## 4.4.6 S6/27- Land of Lakhond Village

<b>Location</b>	: <b>Land of Lakhond Village</b>  Latitude : 23°15'12.11"N Longitude: 69°46'41.11"E
<b>Site Details:</b>	: <ul style="list-style-type: none"> <li>• The Gypsum is utilized for Land Reclamation.</li> <li>• Please refer <b>Figure No 4.11</b> for Photographs of same.</li> </ul>
<b>Google Image</b>	: Site location Map along with sampling locations is presented as <b>Figure No. 4.12.</b>
<b>Gypsum Analysis</b>	: <p>Analysis report is presented at <b>Table No. 4.16.</b></p> <p>The above table indicates that the Gypsum content is 69.7 and pH is 8.20.</p> <p>The heavy metals concentration as per TCLP and STLC as specified in the Schedule -II - Class A, of Hazardous and Other Waste (Management and Transboundary Movement) Rules (2016), indicates that concentration of Metals is well within limit.</p> <p>It may be noted that Gypsum has been removed from the Hazardous Waste category by MoEF and it is categorized as non-hazardous.</p>
<b>Soil Analysis</b>	: <p>Analysis report is Presented at <b>Table No. 4.17.</b></p> <p>The above table indicates that the quality of soil near the Gypsum site is at par with virgin soil. No contamination is observed.</p> <p>Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.</p>



<b>Ground Water Analysis</b>	: Analysis report Presented at <b>Table No. 4.18.</b>  The above table indicates that concentration of all the major parameters is at par with the water standards IS: 10500.  The TDS and Hardness are at par with the ground water quality of the area.
<b>Impact Assessment w.r.t. Soil and Ground Water</b>	: The analysis results of soil and ground water indicates that due to the Gypsum there are no adverse impacts on nearby Soil and Ground Water Quality.

Note:(\*) As per screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines" Guidance document for assessment and remediation of contaminates sites in India, 2015".



Figure No 4.11  
Photographs of Site and Sampling of  
Site-S6/27 - Land of Lakhond Village



**Figure No. 4.12**  
**Site Location Map with Gypsum, Soil and water Sample of**  
**Site-S6/27 - Land of Lakhond Village**



S6/27 G	Gypsum composite sample from sites
S6/27 C	Common for Site S6/27 and S7/28 Soil Sample near Gypsum site
S6/27 & S7/28 B	Common for Site S6/27 and S7/28 Virgin Soil Sample near Gypsum site area
S6/27 & S7/28 W	Common for Site S6/27 and S7/28 Borewell at Near Gypsum site area, Lakhond Village
Latitude : 23°15'12.11"N	
Longitude: 69°46'41.11"E	



**Table No. 4.16**  
**Gypsum Analysis Report- Site S6/27-Land of Lakhond Village**

Parameters	Site No. S6/27 Gypsum sample at Land of Lakhond Village	
	Lat: 23°15'10.16"N	Long: 69°46'40.97"E
pH	8.20	
SiO <sub>2</sub> , %	0.181	
Al <sub>2</sub> O <sub>3</sub> , %	1.024	
Fe <sub>2</sub> O <sub>3</sub> , %	16.464	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	69.7	
<b>TCLP Parameters</b>		
Lead, mg/l	BDL	
Cadmium, mg/l	BDL	
Mercury, mg/l	BDL	
Chromium, mg/l	BDL	
Arsenic, mg/l	BDL	
Selenium, mg/l	BDL	
<b>STLC Parameters</b>		
Copper, mg/l	0.530	
Nickel, mg/l	1.644	
Antimony, mg/l	BDL	
<b>DW Extract Parameters</b>		
Ammonia, mg/l	1.5	
Cyanide, mg/l	BDL	



**Table No. 4.17**  
**Soil Analysis Report- Site S6/27-Land of Lakhond Village**

Parameters	Site No. S6/27, S7/28 soil sample at Near Gypsum Storage at Lakhond Village 2 mt away from site		Site No. S6/27, S7/28 soil sample for Reference 100 mt away from site	
	Lat: 23°15'10.13"N	Long: 69°46'39.81"E	Lat: 23°15'13.12"N	Long: 69°46'44.46"E
Moisture %	4.22		3.46	
pH	8.35		8.83	
Conductivity, mS/cm	0.473		0.202	
Calcium, g/kg	4.08		4.06	
Sodium, g/Kg	5.2		3.2	
Potassium, g/Kg	0.8		0.8	
Sulphate, g/Kg	0.40		0.31	
Ammonia, g/Kg	0.021		0.015	
Copper, g/Kg	0.01		0.02	
Nickel, g/Kg	0.02		0.03	
Zinc, g/Kg	0.03		0.03	
Cadmium, g/Kg	BDL		BDL	
Lead, g/Kg	0.01		0.01	
Chromium, g/Kg	0.02		0.03	
Manganese, g/Kg	0.16		0.24	
Cobalt, g/Kg	0.007		0.008	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL		BDL	



**Table No. 4.18**  
**Ground Water Analysis Report- Site S6/27-Land of Lakhond Village**

Parameter	Unit	Site No. S6/27, S7/28 Borewell at Near Gypsum Storage Area, Lakhond Village 15 mt away from site
		Lat: 23°15'7.49"N, Long: 69°46'39.76"E
pH @ 25 °C	--	7.04
Color	pt. Co	BDL
EC	mS/cm	3.470
Total Hardness	mg/L	730
TDS	mg/L	2614
COD	mg/L	BDL
BOD	mg/L	BDL
Chloride	mg/L	1065
Sulphates	mg/L	470
Ammonical nitrogen	mg/L	0.45
Iron	mg/L	BDL
Zinc	mg/L	0.99
Total Chromium	mg/L	BDL
Fluoride	mg/L	1.73
Nitrate	mg/L	0.85
Calcium	mg/L	56.1
Magnesium	mg/L	143.6
Sodium	mg/L	192
Potassium	mg/L	109
SAR	%	3.09
Lead	mg/L	BDL
Sulphide	mg/L	BDL



#### 4.4.7 S7/28- Adjacent site of site no. S6/27, Lakhond Village

Location	<p>: Adjacent site of site no. S6/27, Lakhond Village</p> <p>Latitude : 23°15'11.04"N, Longitude: 69°46'44.89"E</p>
Site Details:	<p>: • The Gypsum is utilized for Land Reclamation.</p> <p>• Please refer <b>Figure No 4.13</b> for Photographs of same.</p>
Google Image	<p>: Site location map along with sampling location is presented as <b>Figure No. 4.14</b>.</p>
Gypsum Analysis	<p>: Analysis report is presented at <b>Table No. 4.19</b></p> <p>The above table indicates that the Gypsum content is 68.7 and pH is 8.14.</p> <p>The heavy metals concentration as per TCLP and STLC as specified in the Schedule -II - Class A, of Hazardous and Other Waste (Management and Transboundary Movement) Rules (2016), indicates that concentration of Metals is well within limit.</p> <p>It may be noted that Gypsum has been removed from the Hazardous Waste category by MoEF and it is categorized as non-hazardous.</p>
Soil Analysis	<p>: Analysis report is Presented at <b>Table No. 4.20</b></p> <p>The above table indicates that the quality of soil near the Gypsum site is at par with virgin soil. No contamination is observed.</p> <p>Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.</p>

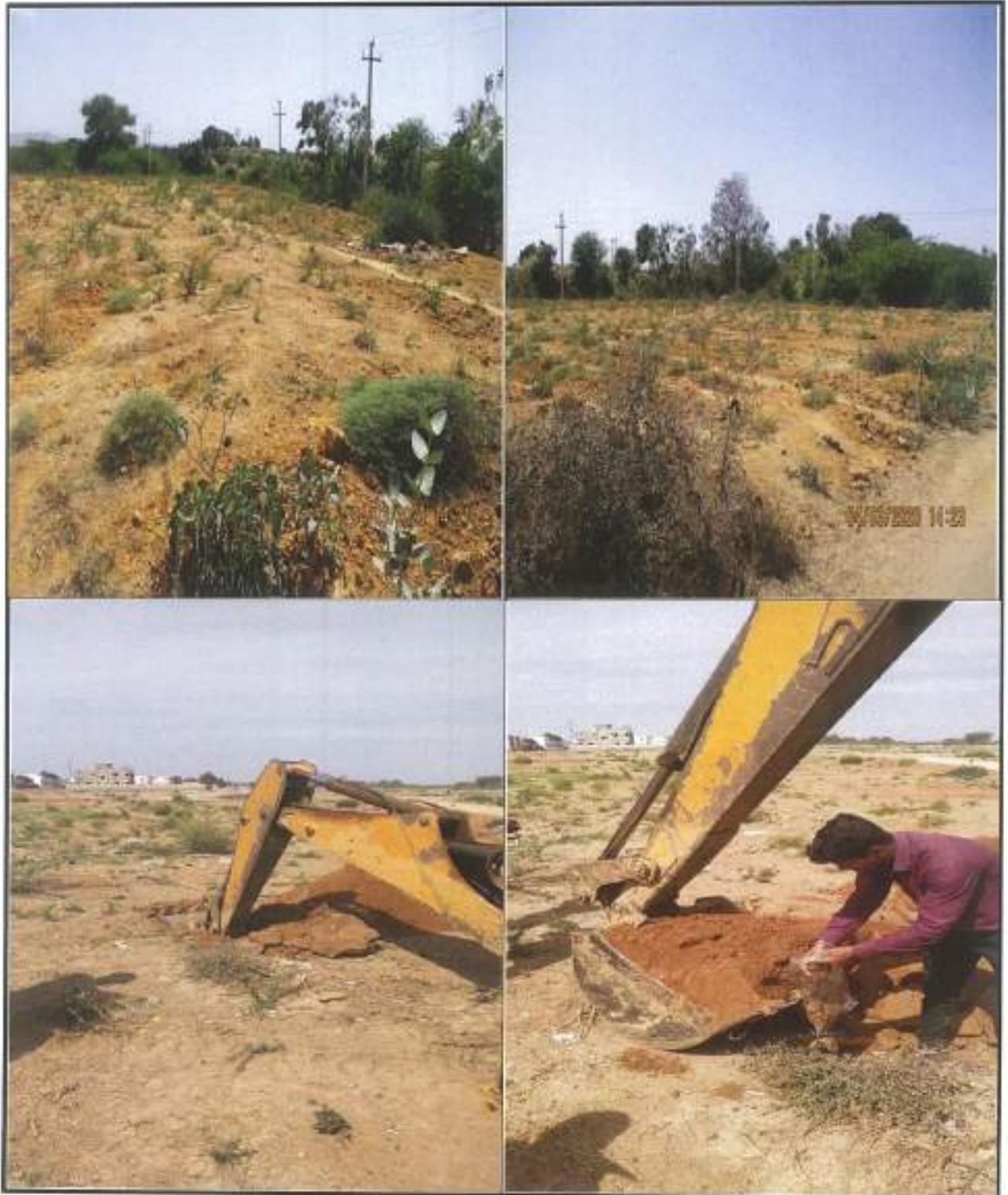


<b>Ground Water Analysis</b>	: Analysis report Presented at <b>Table No. 4.21</b>  The above table indicates that concentration of all the major parameters is at par with the water standards IS: 10500.  The TDS and Hardness are at par with the ground water quality of the area.
<b>Impact Assessment w.r.t. Soil and Ground Water</b>	: The analysis results of soil and ground water indicates that due to the Gypsum there are no adverse impacts on nearby Soil and Ground Water Quality.

Note:(\*) As per screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines" Guidance document for assessment and remediation of contaminates sites in India, 2015".



**Figure No. 4.13**  
**Photographs of Site and Sampling of**  
**Site-S7/28 - Adjacent site of site no. S6/27, Lakhond Village**



**Figure No. 4.14**  
**Site Location Map with Gypsum, Soil and water Sample of**  
**Site-S7/28 - Adjacent site of site no. S6/27, Lakhond Village**



S7/28 G	Gypsum composite sample from site
S6/27 C	Common for Site S6/27 and S7/28 Soil Sample near Gypsum site
S6/27 & S7/28 B	Common for Site S6/27 and S7/28 Virgin Soil Sample near Gypsum site area
S6/27 & S7/28 W	Common for Site S6/27 and S7/28 Borewell at Near Gypsum site area, Lakhond Village
Latitude : 23°15'11.04"N, Longitude: 69°46'44.89"E	



**Table No. 4.19**  
**Gypsum Analysis Report- Site S7/28-Adjacent site of site no. S6/27, Lakhond Village**

Parameters	Site No. S7/28 Gypsum sample at Land of Lakhond Village	
	Lat: 23°15'11.18"N	Long: 69°46'44.83"E
pH	8.14	
SiO <sub>2</sub> , %	0.436	
Al <sub>2</sub> O <sub>3</sub> , %	1.043	
Fe <sub>2</sub> O <sub>3</sub> , %	18.185	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	68.7	
<b>TCLP Parameters</b>		
Lead, mg/l	BDL	
Cadmium, mg/l	BDL	
Mercury, mg/l	BDL	
Chromium, mg/l	0.666	
Arsenic, mg/l	BDL	
Selenium, mg/l	BDL	
<b>STLC Parameters</b>		
Copper, mg/l	0.564	
Nickel, mg/l	0.965	
Antimony, mg/l	BDL	
<b>D/W Extract Parameters</b>		
Ammonia, mg/l	1.86	
Cyanide, mg/l	BDL	



**Table No. 4.20**  
**Soil Analysis Report- Site S7/28 -Adjacent site of site no. S6/27, Lakhond**  
**Village**

Parameters	Site No. S6/27, S7/28 soil sample at Near Gypsum Storage at Lakhond Village 150 mt away from site		Site No. S6/27, S7/28 soil sample for Reference 30mt away from site	
	Lat: 23°15'10.13"N	Long: 69°46'39.81"E	Lat: 23°15'13.12"N	Long: 69°46'44.46"E
Moisture %	4.22		3.46	
pH	8.35		8.83	
Conductivity, mS/cm	0.473		0.202	
Calcium, g/kg	4.08		4.06	
Sodium, g/Kg	5.2		3.2	
Potassium, g/Kg	0.8		0.8	
Sulphate, g/Kg	0.40		0.31	
Ammonia, g/Kg	0.021		0.015	
Copper, g/Kg	0.01		0.02	
Nickel, g/Kg	0.02		0.03	
Zinc, g/Kg	0.03		0.03	
Cadmium, g/Kg	BDL		BDL	
Lead, g/Kg	0.01		0.01	
Chromium, g/Kg	0.02		0.03	
Manganese, g/Kg	0.16		0.24	
Cobalt, g/Kg	0.007		0.008	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL		BDL	



**Table No. 4.21**  
**Ground Water Analysis Report- Site S7/28-Adjacent site of site no. S6/27,**  
**Lakhond Village**

Parameter	Unit	Site No. S6/27, S7/28 Borewell at Near Gypsum Storage Area, Lakhond Village
		Lat: 23°15'7.49"N, Long: 69°46'39.76"E
pH @ 25 °C	--	7.04
Color	pt. Co	BDL
EC	mS/cm	3.470
Total Hardness	mg/L	730
TDS	mg/L	2614
COD	mg/L	BDL
BOD	mg/L	BDL
Chloride	mg/L	1065
Sulphates	mg/L	470
Ammonical nitrogen	mg/L	0.45
Iron	mg/L	BDL
Zinc	mg/L	0.99
Total Chromium	mg/L	BDL
Fluoride	mg/L	1.73
Nitrate	mg/L	0.85
Calcium	mg/L	56.1
Magnesium	mg/L	143.6
Sodium	mg/L	192
Potassium	mg/L	109
SAR	%	3.09
Lead	mg/L	BDL
Sulphide	mg/L	BDL



#### 4.4.8 S8/29- On Government Land, Padhdhar Village

Location	<p>: <b>On Government Land, Padhdhar Village</b></p> <p>Latitude : 23°14'25.30"N, Longitude: 69°48'44.13"E</p>
Site Details:	<p>: • The Gypsum is laid on open land. Scrubbed are grown on the same land.</p> <p>• Please refer <b>Figure No 4.15</b> for Photographs of same.</p>
Google Image	<p>: Site location map along with sampling location is presented as <b>Figure No. 4.16.</b></p>
Gypsum Analysis	<p>: Analysis report is presented at <b>Table No. 4.22</b></p> <p>The above table indicates that the Gypsum content is 62.0 and pH is 8.23.</p> <p>The heavy metals concentration as per TCLP and STLC as specified in the Schedule -II - Class A, of Hazardous and Other Waste (Management and Transboundary Movement) Rules (2016), indicates that concentration of Metals is well within limit.</p> <p>It may be noted that Gypsum has been removed from the Hazardous Waste category by MoEF and it is categorized as non-hazardous.</p>
Soil Analysis	<p>: Analysis report is Presented at <b>Table No. 4.23</b></p> <p>The above table indicates that the quality of soil near the Gypsum site is at par with virgin soil. No contamination is observed.</p> <p>Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.</p>



<b>Ground Water Analysis</b>	:	<p>Analysis report Presented at <b>Table No. 4.24</b></p> <p>The above table indicates that concentration of all the major parameters is at par with the water standards IS: 10500.</p> <p>The TDS and Hardness are at par with the ground water quality of the area.</p>
<b>Impact Assessment w.r.t. Soil and Ground Water</b>	:	<p>The analysis results of soil and ground water indicates that due to the Gypsum there are no adverse impacts on nearby soil and Ground Water Quality.</p>

Note:(\*) As per screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines" Guidance document for assessment and remediation of contaminates sites in India, 2015".



**Figure No. 4.15**  
**Photographs of Site and Sampling of**  
**Site-S8/29 - On Government Land, Padhdhar Village**



**Figure No. 4.16**  
**Site Location Map with Gypsum, Soil and water Sample of**  
**Site-S8/29 - On Government Land, Padhdhar Village**



Google Earth

www.google.com/earth

S8/29 G	Gypsum Sample from 10 Different Location
S8/29 C	Soil Sample near Gypsum site
S8/29 B	Virgin Soil Sample near Gypsumsite area
S8/29 W	Borewell at Govindbhai, Nr. Padhdhar Police Station, Vill.: Padhdhar
Latitude : 23°14'25.30"N,	
Longitude: 69°48'44.13"E	



**Table No. 4.22**  
**Gypsum Analysis Report- Site S8/29-On Government Land, Padhdhar Village**

Parameters	Site No. S8/29 Gypsum sample at 2 ft Depth. Government land, Padhdhar Village	
	Lat: 23°14'25.68"N	Long: 69°48'44.27"E
pH	8.23	
SiO <sub>2</sub> , %	0.279	
Al <sub>2</sub> O <sub>3</sub> , %	1.059	
Fe <sub>2</sub> O <sub>3</sub> , %	16.858	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	62.0	
<b>TCLP Parameters</b>		
Lead, mg/l	BDL	
Cadmium, mg/l	BDL	
Mercury, mg/l	BDL	
Chromium, mg/l	BDL	
Arsenic, mg/l	BDL	
Selenium, mg/l	BDL	
<b>STLC Parameters</b>		
Copper, mg/l	0.326	
Nickel, mg/l	1.653	
Antimony, mg/l	BDL	
<b>D/W Extract Parameters</b>		
Ammonia, mg/l	BDL	
Cyanide, mg/l	BDL	



**Table No. 4.23**  
**Soil Analysis Report- Site S8/29-On Government Land, Padhdhar Village**

Parameters	Site No. S8/29 Soil sample Near Padhdhar police station, Padhdhar Village 2 mt away from site		Site No. S8/29 soil Reference sample 35mt away from site	
	Lat: 23°14'25.16"N	Long: 69°48'45.54"E	Lat: 23°14'28.02"N	Long: 69°48'45.21"E
Moisture %	3.10		3.16	
pH	8.60		8.85	
Conductivity, mS/cm	0.838		0.296	
Calcium, g/kg	1.90		1.60	
Sodium, g/Kg	5.2		2.4	
Potassium, g/Kg	1.5		0.8	
Sulphate, g/Kg	0.28		0.29	
Ammonia, g/Kg	0.018		0.013	
Copper, g/Kg	0.02		0.01	
Nickel, g/Kg	0.01		0.01	
Zinc, g/Kg	0.03		0.03	
Cadmium, g/Kg	BDL		BDL	
Lead, g/Kg	0.01		0.01	
Chromium, g/Kg	0.02		0.02	
Manganese, g/Kg	0.17		0.08	
Cobalt, g/Kg	0.010		0.009	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL		BDL	



**Table No. 4.24**  
**Ground Water Analysis Report- Site S8/29-On Government Land, Padhdhar**  
**Village**

Parameter	Unit	Site No. S8/29 Borewell at Govindbhai , Near Padhdhar Police Station, Padhdhar Village 55 mt away from site
		Lat: 23°14'26.66"N, Long: 69°48'47.22"E
pH @ 25 °C	–	7.17
Color	pt. Co	BDL
EC	mS/cm	2.436
Total Hardness	mg/L	400
TDS	mg/L	1728
COD	mg/L	BDL
BOD	mg/L	BDL
Chloride	mg/L	520
Sulphates	mg/L	478
Ammonical nitrogen	mg/L	0.22
Iron	mg/L	BDL
Zinc	mg/L	0.77
Total Chromium	mg/L	BDL
Fluoride	mg/L	1.83
Nitrate	mg/L	0.13
Calcium	mg/L	44.1
Magnesium	mg/L	70.5
Sodium	mg/L	104
Potassium	mg/L	82
SAR	%	2.26
Lead	mg/L	BDL
Sulphide	mg/L	BDL



#### 4.4.9 S9/30- B/h. Mangal Mandir School, Village Bhujodi

Location	: B/h. Mangal Mandir School, Village Bhujodi  Latitude : 23°13'45.11"N, Longitude: 69°44'08.96"E
Site Details:	: <ul style="list-style-type: none"> <li>• The Gypsum is laid behind Mangal Mandir School of Bhujodi village.</li> <li>• Please refer <b>Figure No 4.17</b> for Photographs of same.</li> </ul>
Google Image	: Site location map along with sampling location is presented as <b>Figure No 4.18</b> .
Gypsum Analysis	: Analysis report is presented at <b>Table No. 4.25</b>  The above table indicates that the Gypsum content is 63.8 and pH is 7.76.  The heavy metals concentration as per TCLP and STLC as specified in the Schedule -II - Class A, of Hazardous and Other Waste (Management and Transboundary Movement) Rules (2016), indicates that concentration of Metals is well within limit.  It may be noted that Gypsum has been removed from the Hazardous Waste category by MoEF and it is categorized as non-hazardous.
Soil Analysis	: Analysis report is Presented at <b>Table No. 4.26</b>  The above table indicates that the quality of soil near the Gypsum site is at par with virgin soil. No contamination is observed.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.



<b>Ground Water Analysis</b>	: Analysis report Presented at <b>Table No. 4.27</b>  The above table indicates that concentration of all the major parameters is at par with the water standards IS: 10500 except Ammonical Nitrogen. This indicates intrusion of sewage with ground water. The TDS and Hardness are at par with the ground water quality of the area.
<b>Impact Assessment w.r.t. Soil and Ground Water</b>	: The analysis results of soil and ground water indicates that due to the Gypsum there are no adverse impacts on nearby soil and Ground Water Quality, however Ammonical Nitrogen are observed in the bore well sample. This indicates intrusion of sewage with ground water.

Note:(\*) As per screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines" Guidance document for assessment and remediation of contaminates sites in India, 2015".,



**Figure No 4.17**  
**Photographs of Site and Sampling of**  
**Site-S9/30 – B/h. Mangal Mandir School, Village Bhujodi**



**Figure No. 4.18**  
**Site Location Map with Gypsum, Soil and water Sample of**  
**Site-S9/30 – B/h. Mangal Mandir School, Village Bhujodi**



S9/30 G	Gypsum Composite sample from site
S9/30 C	Soil Sample near Gypsum site
S9/30 B	Virgin Soil Sample near Gypsum site area
S9/30 W	Borewell of Jinabhai Farm opp. Mangal Mandir School at Village Bhujodi
Latitude : 23°13'45.11"N	
Longitude: 69°44'08.96"E	



**Table No. 4.25**  
**Gypsum Analysis Report- Site S9/30- B/h. Mangal Mandir School,**  
**Bhujodi Village**

Parameters	Site No. S9/30 Gypsum sample B/h. Mangal Mandir School, Bhujodi village	
	Lat: 23°13'44.24"N	Long: 69°44'9.03"E
pH	7.76	
SiO <sub>2</sub> , %	0.142	
Al <sub>2</sub> O <sub>3</sub> , %	0.914	
Fe <sub>2</sub> O <sub>3</sub> , %	12.613	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	63.8	
<b>TCLP Parameters</b>		
Lead, mg/l	BDL	
Cadmium, mg/l	BDL	
Mercury, mg/l	BDL	
Chromium, mg/l	0.117	
Arsenic, mg/l	BDL	
Selenium, mg/l	BDL	
<b>STLC Parameters</b>		
Copper, mg/l	0.390	
Nickel, mg/l	0.545	
Antimony, mg/l	BDL	
<b>D/W Extract Parameters</b>		
Ammonia, mg/l	BDL	
Cyanide, mg/l	BDL	



**Table No. 4.26**  
**Soil Analysis Report- Site S9/30-B/h. Mangal Mandir School Village**

Parameters	Site No. S9/30 Soil sample Near Gypsum Storage B/h. Mangal Mandir School, Village : Bhujodi 2 mt away from site		Site No. S9/30 Soil Reference sample 45 mt away from site	
	Lat: 23°13'43.99"N	Long: 69°44'7.60"E	Lat: 23°13'43.98"N	Long: 69°44'6.05"E
Moisture %	6.16		4.18	
pH	7.94		7.70	
Conductivity, mS/cm	0.160		0.108	
Calcium, g/kg	4.80		4.10	
Sodium, g/Kg	2.4		1.6	
Potassium, g/Kg	0.8		0.4	
Sulphate, g/Kg	0.28		0.29	
Ammonia, g/Kg	0.013		0.013	
Copper, g/Kg	0.01		0.02	
Nickel, g/Kg	0.01		0.01	
Zinc, g/Kg	0.02		0.02	
Cadmium, g/Kg	BDL		BDL	
Lead, g/Kg	0.01		0.01	
Chromium, g/Kg	0.01		0.02	
Manganese, g/Kg	0.10		0.12	
Cobalt, g/Kg	0.010		0.005	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL		BDL	



**Table No. 4.27**  
**Ground Water Analysis Report- Site S9/30-B/h. Mangal Mandir School Village**

Parameter	Unit	Site No. S9/30 Borewell at Jinabhai farm, opp. Mangal Mandir School, Village Bhujodi 210 mt away from site
		Lat: 23°13'53.26"N, Long: 69°44'12.86"E
pH @ 25 °C	—	7.03
Color	pt. Co	BDL
EC	mS/cm	4.920
Total Hardness	mg/L	1130
TDS	mg/L	3422
COD	mg/L	BDL
BOD	mg/L	BDL
Chloride	mg/L	1165
Sulphates	mg/L	750
Ammonical nitrogen	mg/L	0.67
Iron	mg/L	0.12
Zinc	mg/L	1.47
Total Chromium	mg/L	BDL
Fluoride	mg/L	1.15
Nitrate	mg/L	0.63
Calcium	mg/L	248.5
Magnesium	mg/L	123.9
Sodium	mg/L	200
Potassium	mg/L	94
SAR	%	2.59
Lead	mg/L	BDL
Sulphide	mg/L	BDL



#### 4.4.10 S10/31- Behind Lehriya Hanuman

<b>Location</b>	:	<b>Behind Lehriya Hanuman</b>  Latitude : 23°13'21.14"N, Longitude : 69°46'21.09"E
<b>Site Details:</b>	:	<ul style="list-style-type: none"> <li>• The Gypsum is laid in abandoned mines near the Lehriya Hanuman temple.</li> <li>• Please refer <b>Figure No 4.19</b> for Photographs of same.</li> </ul>
<b>Google Image</b>	:	Site location map along with sampling locations is presented as <b>Figure No. 4.20</b> .
<b>Gypsum Analysis</b>	:	<p>Analysis report is presented at <b>Table No. 4.28</b></p> <p>The above table indicates that the Gypsum content is 59.9 and pH is 8.10.</p> <p>The heavy metals concentration as per TCLP and STLC as specified in the Schedule -II - Class A, of Hazardous and Other Waste (Management and Transboundary Movement) Rules (2016), indicates that concentration of Metals is well within limit.</p> <p>It may be noted that Gypsum has been removed from the Hazardous Waste category by MoEF and it is categorized as non-hazardous.</p>

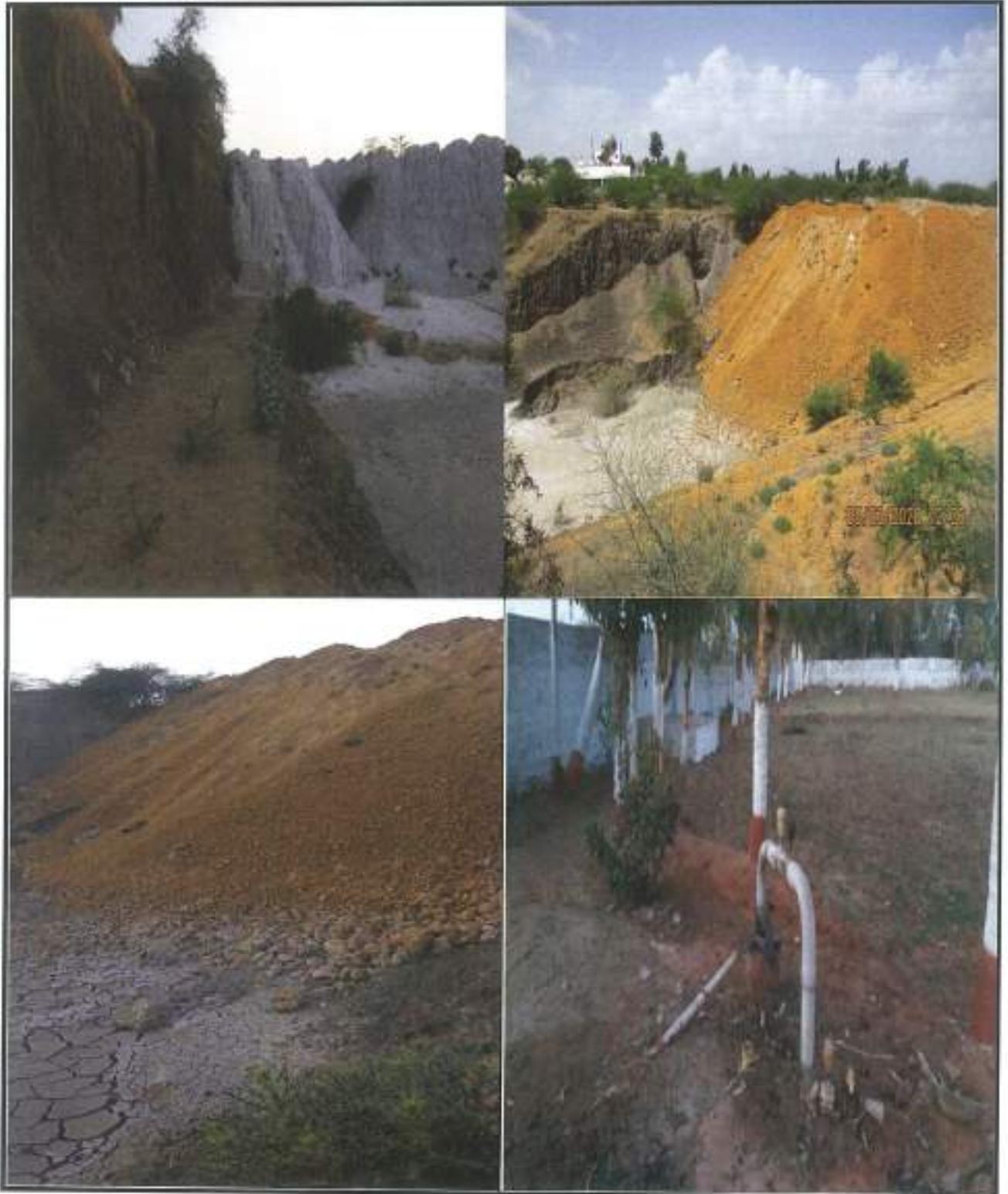


<b>Soil Analysis</b>	<p>: Soil analysis report is presented at <b>Table No. 4.29.</b></p> <p>As shown in above table, the soil sample was taken adjacent to the Gypsum site. It indicates slightly elevated levels of mineral contents viz. Ca, K, SO<sub>4</sub>, and Sodium compared to the virgin soil. This could be due to adjacent Gypsum site. It will not have any detrimental effect on the surrounding soil quality as these are primary and secondary major plant nutrients.</p> <p>Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.</p>
<b>Ground Water Analysis</b>	<p>: Analysis report Presented at <b>Table No. 4.30</b></p> <p>The above table indicates that concentration of all the major parameters is at par with the water standards IS: 10500. The TDS and Hardness are at par with the ground water quality of the area.</p>
<b>Impact Assessment w.r.t. Soil and Ground Water</b>	<p>: The analysis results of soil and ground water indicates that due to the Gypsum there is no adverse impact on nearby soil and Ground Water Quality.</p>

Note:(\*) As per screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines" Guidance document for assessment and remediation of contaminates sites in India, 2015".



**Figure No 4.19**  
**Photographs of Site and Sampling of**  
**Site-S10/31 - Behind Lehriya Hanuman at Village Kukma**



**Figure No. 4.20**  
**Site Location Map with Gypsum, Soil and water Sample of**  
**Site-S10/31 - Behind Lehriya Hanuman at Village Kukma**



S10/31 G	Gypsum Sample from 10 Different Location
S10/31 C	Soil Sample near Gypsum site
S10/31 B	Virgin Soil Sample near Gypsumsite area
S10/31 W	Borewell of Laheriya Hanuman Temple at Village Kukma
Latitude : 23°13'21.14"N,	
Longitude : 69°46'21.09"E	



**Table No. 4.28**  
**Gypsum Analysis Report- Site S10/31-Behind Lehriya Hanuman**

Parameters	Site No. S10/31 Gypsum sample near Old Stone Mine, Kukma village	
	Lat: 23°13'19.37"N	Long: 69°46'20.52"E
pH	8.10	
SiO <sub>2</sub> , %	0.196	
Al <sub>2</sub> O <sub>3</sub> , %	1.069	
Fe <sub>2</sub> O <sub>3</sub> , %	15.044	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O , %	59.9	
<b>TCLP Parameters</b>		
Lead , mg/l	BDL	
Cadmium , mg/l	BDL	
Mercury , mg/l	BDL	
Chromium , mg/l	BDL	
Arsenic , mg/l	BDL	
Selenium , mg/l	BDL	
<b>STLC Parameters</b>		
Copper , mg/l	0.279	
Nickel , mg/l	1.283	
Antimony , mg/l	BDL	
<b>DW Extract Parameters</b>		
Ammonia , mg/l	BDL	
Cyanide , mg/l	BDL	



**Table No. 4.29**  
**Soil Analysis Report- Site S10/31-Behind Lehriya Hanuman**

Parameters	Site No. S10/31 Soil sample at old stone mines, Kukma Village 2 mt away from site		Site No. S10/31 2mts depth Soil Reference sample 85 mt away from site	
	Lat: 23°13'19.37"N	Long: 69°46'20.52"E	Lat: 23°13'17.43"N	Long: 69°46'24.01"E
Moisture %	3.32		3.28	
pH	8.43		8.82	
Conductivity, mS/cm	4.08		0.305	
Calcium, g/kg	9.94		6.89	
Sodium, g/Kg	17.6		4.4	
Potassium, g/Kg	5.0		1.0	
Sulphate, g/Kg	8.76		0.32	
Ammonia, g/Kg	0.018		0.017	
Copper, g/Kg	0.026		0.02	
Nickel, g/Kg	0.03		0.02	
Zinc, g/Kg	0.024		0.020	
Cadmium, g/Kg	BDL		BDL	
Lead, g/Kg	BDL		BDL	
Chromium, g/Kg	0.02		0.01	
Manganese, g/Kg	0.40		0.12	
Cobalt, g/Kg	0.010		0.007	
Gypsum as CaSo <sub>4</sub> .2H <sub>2</sub> O, %	BDL		BDL	



**Table No. 4.30**  
**Ground Water Analysis Report- Site S10/31-Behind Lehriya Hanuman**

Parameter	Unit	Site No. S10/31 Borewell at Lehariya hanuman Temple, Kukma Village 100 mt away from site
		Lat: 23°13'20.13"N, Long: 69°46'14.86"E
pH @ 25 °C	—	7.70
Color	pt. Co	BDL
EC	mS/cm	2.687
Total Hardness	mg/L	630
TDS	mg/L	1990
COD	mg/L	BDL
BOD	mg/L	BDL
Chloride	mg/L	875
Sulphates	mg/L	265
Ammonical nitrogen	mg/L	0.33
Iron	mg/L	BDL
Zinc	mg/L	0.87
Total Chromium	mg/L	BDL
Fluoride	mg/L	1.85
Nitrate	mg/L	1.0
Calcium	mg/L	172.3
Magnesium	mg/L	48.6
Sodium	mg/L	102
Potassium	mg/L	78
SAR	%	1.77
Lead	mg/L	BDL
Sulphide	mg/L	BDL



#### 4.4.11 S11/32-Old stone mine of Prakash Patel, Beside old Hot Mix plant, Kukma Village

Location	: Old stone mine of Prakash Patel, Beside old Hot Mix plant, Kukma Village  Latitude : 23°13'14.95"N, Longitude : 69°46'06.28"E
Site Details:	: <ul style="list-style-type: none"> <li>• The Gypsum is utilized for bag filling in abandoned mines beside old hot mix plant, Kukma Village. The adjacent and beneath soil is hard rock.</li> <li>• Please refer <b>Figure No 4.21</b> for Photographs of same.</li> </ul>
Google Image	: Site location map along with sampling locations is presented as <b>Figure No. 4.22</b> .
Gypsum Analysis	: Analysis report is presented at <b>Table No. 4.31</b>  The above table indicates that the Gypsum content is 58.9 and pH is 8.20.  The heavy metals concentration as per TCLP and STLC as specified in the Schedule -II - Class A, of Hazardous and Other Waste (Management and Transboundary Movement) Rules (2016), indicates that concentration of Metals is well within limit.  It may be noted that Gypsum has been removed from the Hazardous Waste category by MoEF and it is categorized as non-hazardous.
Soil Analysis	: Analysis report is Presented at <b>Table No. 4.32</b>  As shown in above table, the soil sample was taken adjacent to the Gypsum site. It indicates slightly elevated levels of mineral contents viz. Ca, K, SO <sub>4</sub> and Sodium compared to the virgin soil. This could be due to adjacent Gypsum site. It will not have any detrimental effect on the surrounding soil quality as these are primary and secondary major plant nutrients.





Figure No. 4.21  
Photographs of Site and Sampling of Site-S11/32 -  
Old stone mine of Prakash Patel, Beside old Hot Mix plant, Kukma Village



**Figure No. 4.22**  
**Site Location Map with Gypsum, Soil and water Sample of**  
**Site-S11/32 - Old stone mine of Prakash Patel, Beside old Hot Mix plant, Kukma**  
**Village**



S11/32 G	Gypsum Composite Sample
S11/32 C	Soil Sample near Gypsum site
S11/32 B	Virgin Soil Sample near Gypsum site area
Latitude : 23°13'14.95"N,	
Longitude : 69°46'06.28"E	



**Table No. 4.31**  
**Gypsum Analysis Report- Site S11/32-Old stone mine of Prakash Patel, Beside**  
**old Hot Mix plant, Kukma Village**

Parameters	Site No.S11/32 Gypsum sample near mines Beside old hot mix plant, Kukma village	
	Lat: 23°13'14.83"N	Long: 69°46'6.02"E
pH	8.20	
SiO <sub>2</sub> , %	0.193	
Al <sub>2</sub> O <sub>3</sub> , %	1.102	
Fe <sub>2</sub> O <sub>3</sub> , %	17.023	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	58.9	
<b>TCLP Parameters</b>		
Lead, mg/l	BDL	
Cadmium, mg/l	BDL	
Mercury, mg/l	BDL	
Chromium, mg/l	BDL	
Arsenic, mg/l	BDL	
Selenium, mg/l	BDL	
<b>STLC Parameters</b>		
Copper, mg/l	0.617	
Nickel, mg/l	1.761	
Antimony, mg/l	BDL	
<b>D/W Extract Parameters</b>		
Ammonia, mg/l	BDL	
Cyanide, mg/l	BDL	



**Table No. 4.32**  
**Soil Analysis Report- Site S11/32-Old stone mine of Prakash Patel, Beside old**  
**Hot Mix plant, Kukma Village**

Parameters	Site No. S11/32 soil sample at 2 mt Depth Besides Old hot mix plant, Kukma Village 2 mt away from site		Site No. S11/32 soil sample at for Reference 20 mt away from site	
	Lat: 23°13'14.52"N	Long: 69°46'6.24"E	Lat: 23°13'13.32"N	Long: 69°46'6.84"E
Moisture %	3.26		4.88	
pH	7.94		8.91	
Conductivity, mS/cm	3.506		0.185	
Calcium, g/kg	9.61		8.01	
Sodium, g/Kg	14.0		2.6	
Potassium, g/Kg	4.4		1.2	
Sulphate, g/Kg	1.05		0.30	
Ammonia, g/Kg	0.015		0.015	
Copper, g/Kg	0.02		0.015	
Nickel, g/Kg	0.03		0.03	
Zinc, g/Kg	0.09		0.08	
Cadmium, g/Kg	BDL		BDL	
Lead, g/Kg	0.01		0.01	
Chromium, g/Kg	0.02		0.02	
Manganese, g/Kg	1.29		0.95	
Cobalt, g/Kg	0.03		0.025	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL		BDL	



#### 4.4.12 S12/33-Behind khatri mills, beside of above site, Traverse, Government land, Kukma Village

Location	:	Behind khatri mills, Beside of above site, Traverse, Government land, Kukma Village  Latitude : 23°13'20.70"N, Longitude : 69°45'58.87"E
Site Details:	:	<ul style="list-style-type: none"> <li>• The Gypsum is laid in abandoned mines behind the Khatri Mill, Kukma Village. The adjacent and beneath soil is hard rock.</li> <li>• Please refer <b>Figure No 4.23</b> for Photographs of same.</li> </ul>
Google Image	:	Site location map along with sampling locations is presented as <b>Figure No. 4.24</b> .
Gypsum Analysis	:	<p>Analysis report is presented at <b>Table No. 4.33</b></p> <p>The above table indicates that the Gypsum content is 60.2 and pH is 8.42.</p> <p>The heavy metals concentration as per TCLP and STLC as specified in the Schedule -II - Class A, of Hazardous and Other Waste (Management and Transboundary Movement) Rules (2016), indicates that concentration of Metals is well within limit.</p> <p>It may be noted that Gypsum has been removed from the Hazardous Waste category by MoEF and it is categorized as non-hazardous.</p>
Soil Analysis	:	<p>Analysis report is Presented at <b>Table No. 4.34</b></p> <p>The above table indicates that the quality of soil near the Gypsum site is at par with virgin soil. No contamination is observed.</p> <p>Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.</p>



<b>Ground Water Analysis</b>	:	Analysis report Presented at <b>Table No. 4.35</b>  The above table indicates that concentration of all the major parameters is at par with the water standards IS: 10500. The TDS and Hardness are at par with the ground water quality of the area.
<b>Impact Assessment w.r.t. Soil and Ground Water</b>	:	The analysis results of soil and ground water indicates that due to the Gypsum there is no adverse impact on nearby soil and Ground Water Quality.

Note:(\*) As per screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines" Guidance document for assessment and remediation of contaminates sites in India, 2015".



**Figure No. 4.23**  
**Photographs of Site and Sampling of Site-S12/33**  
**Behind khatri mills, Beside of above site, Traverse, Government land,**  
**KukmaVillage**



**Figure No. 4.24**  
**Site Location Map with Gypsum, Soil and water Sample of**  
**Site-S12/33 - Behind khatri mills, Beside of above site, Traverse, Government**  
**land, KukmaVillage**



S12/33 G	Gypsum Composite sample from 1 ft depth at site
S12/33C	Soil Sample near Gypsum site
S12/33B	Virgin Soil Sample near Gypsum site area
S12/33 W1	Borewell at Near GWIL 650 ft, Kukma Village
Latitude : 23°13'20.70"N,	
Longitude : 69°45'58.87"E	



**Table No. 4.33**  
**Gypsum Analysis Report- Site S12/33-Behind khatri mills, Beside of above site,**  
**Traverse, Government land, Kukma Village**

Parameters	Site No. S12/33 Gypsum sample near Mines B/h. Khatri Mill, Kukma village	
	Lat: 23°13'20.00"N	Long: 69°45'58.00"E
pH	8.42	
SiO <sub>2</sub> , %	0.14	
Al <sub>2</sub> O <sub>3</sub> , %	0.996	
Fe <sub>2</sub> O <sub>3</sub> , %	16.000	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O , %	60.2	
<b>TCLP Parameters</b>		
Lead , mg/l	BDL	
Cadmium , mg/l	BDL	
Mercury , mg/l	BDL	
Chromium , mg/l	BDL	
Arsenic , mg/l	BDL	
Selenium , mg/l	BDL	
<b>STLC Parameters</b>		
Copper , mg/l	0.615	
Nickel , mg/l	1.520	
Antimony , mg/l	BDL	
<b>D/W Extract Parameters</b>		
Ammonia , mg/l	BDL	
Cyanide , mg/l	BDL	



**Table No. 4.34**  
**Soil Analysis Report- Site S12/33-Behind khatri mills, Beside of above site,**  
**Traverse, Government land, Kukma Village**

Parameters	Site No. S12/33 soil sample at 1 mt depth Near Gypsum Storage at Mines B/h. Khatri Mill, Kukma Village 2 mt away from site		Site No. S12/33 soil sample at for Reference 250 mt away from site	
	Lat: 23°13'20.59"N	Long: 69°45'58.54"E	Lat: 23°13'18.20"N	Long: 69°45'48.00"E
Moisture %	5.36		4.22	
pH	9.49		8.64	
Conductivity, mS/cm	0.840		0.362	
Calcium, g/kg	5.13		4.81	
Sodium, g/Kg	6.4		2.6	
Potassium, g/Kg	1.6		1.1	
Sulphate, g/Kg	0.56		0.18	
Ammonia, g/Kg	0.012		0.008	
Copper, g/Kg	0.015		0.010	
Nickel, g/Kg	0.02		0.01	
Zinc, g/Kg	0.03		0.02	
Cadmium, g/Kg	BDL		BDL	
Lead, g/Kg	0.01		0.01	
Chromium, g/Kg	0.01		0.01	
Manganese, g/Kg	0.28		0.06	
Cobalt, g/Kg	0.040		0.044	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL		BDL	



**Table No. 4.35**  
**Ground Water Analysis Report- Site S12/33-Behind khatri mills, Beside of**  
**above site, Traverse, Government land, Kukma Village**

Parameter	Unit	Site No. S12/33Borewell at Near GWIL 650 ft, Kukma Village 360 mt away from site
		Lat: 23°13'11.85"N, Long: 69°45'46.93"E
pH @ 25 °C	--	7.12
Color	pt. Co	BDL
EC	mS/cm	1.442
Total Hardness	mg/L	450
TDS	mg/L	872
COD	mg/L	BDL
BOD	mg/L	BDL
Chloride	mg/L	265
Sulphates	mg/L	217
Ammonical nitrogen	mg/L	0.33
Iron	mg/L	BDL
Zinc	mg/L	0.51
Total Chromium	mg/L	BDL
Fluoride	mg/L	0.82
Nitrate	mg/L	0.28
Calcium	mg/L	48.1
Magnesium	mg/L	104.5
Sodium	mg/L	48
Potassium	mg/L	12
SAR	%	0.89
Lead	mg/L	BDL
Sulphide	mg/L	BDL



#### 4.4.13 S13/34- China Clay mine of Vastabhai, Village Lakhond, Abandoned mine.

Location	: China Clay mine of Vastabhai, Village Lakhond, Abandoned mine  Latitude : 23°15'39.24"N, Longitude : 69°47'17.05"E
Site Details:	: <ul style="list-style-type: none"> <li>• The Gypsum is laid in abandoned mine the adjacent and beneath soil is hard rock.</li> <li>• Please refer <b>Figure No 4.25</b> for Photographs of same.</li> </ul>
Google Image	: Site location map along with sampling locations is shown in <b>Figure No. 4.26</b> .
Gypsum Analysis	: Analysis report is presented at <b>Table No. 4.36</b>  The above table indicates that the Gypsum content is 63.5 and pH is 8.33.  The heavy metals concentration as per TCLP and STLC as specified in the Schedule -II - Class A, of Hazardous and Other Waste (Management and Transboundary Movement) Rules (2016), indicates that concentration of Metals is well within limit.  It may be noted that Gypsum has been removed from the Hazardous Waste category by MoEF and it is categorized as non-hazardous.
Soil Analysis	: Analysis report is Presented at <b>Table No. 4.37</b>  The above table indicates that the quality of soil near the Gypsum site is at par with virgin soil of nearby sites. No contamination is observed.  Comparing the virgin and site soil sample with Screening and Responsive Level as specified by MoEF (*), it indicates that levels in both virgin and site sample are below screening levels.



<b>Ground Water Analysis</b>	:	<p>Analysis report Presented at <b>Table No. 4.38</b></p> <p>The above table indicates that concentration of all the major parameters is at par with the water standards IS: 10500. The TDS and Hardness are at par with the ground water quality of the area.</p>
<b>Impact Assessment w.r.t. Soil and Ground Water</b>	:	<p>The analysis results of soil and ground water indicates that due to the Gypsum there is no adverse impact on nearby soil and Ground Water Quality.</p>

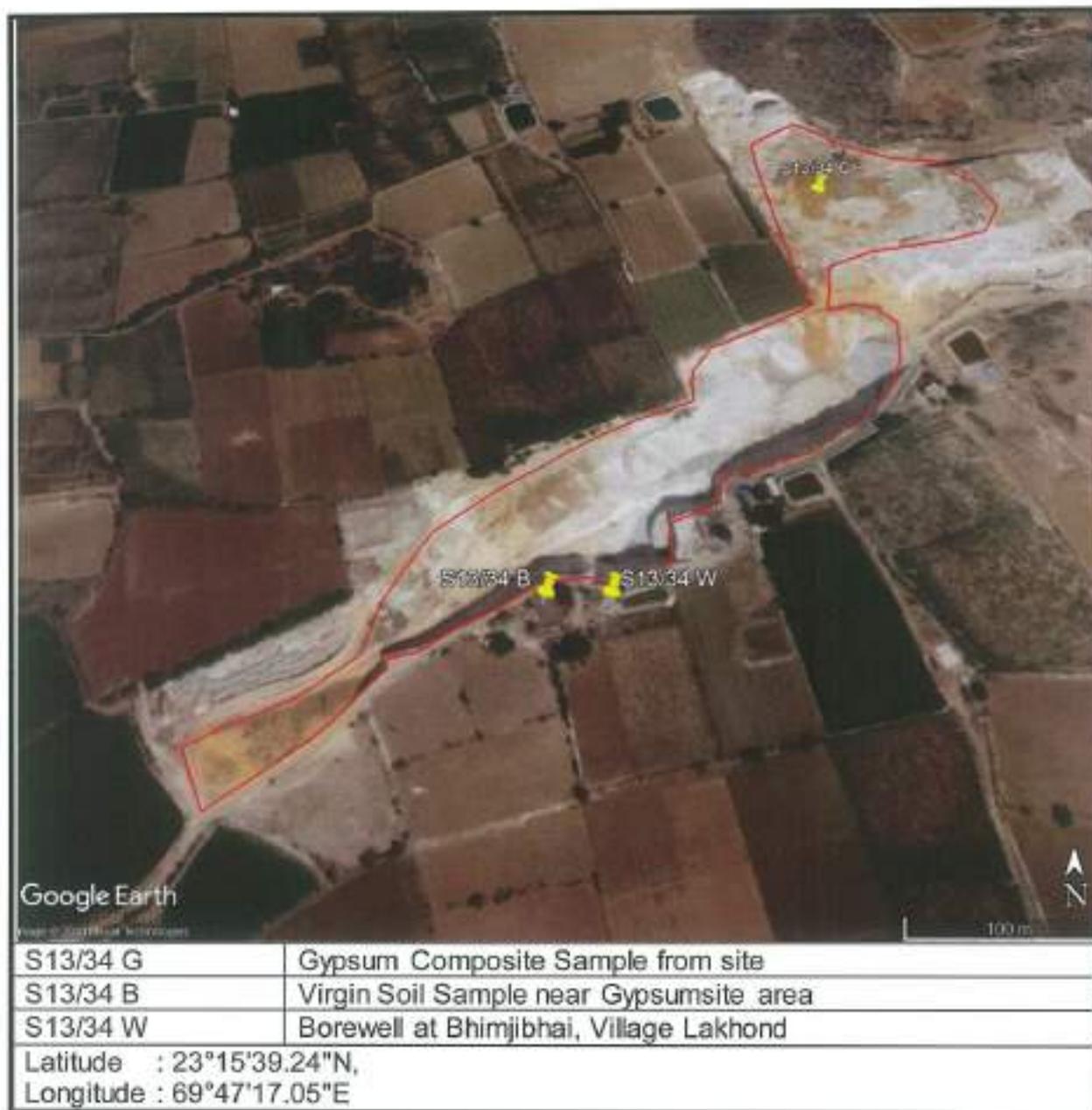
Note:(\*) As per screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines "Guidance document for assessment and remediation of contaminates sites in India, 2015".



**Figure No. 4.25**  
**Photographs of Site and Sampling of**  
**Site-S13/34 - China Clay mine of Vastabhai, Village Lakhond, Abandoned mine**



**Figure No. 4.26**  
**Site Location Map with Gypsum, Soil and water Sample of**  
**Site-S13/34 - China Clay mine of Vastabhai, Village Lakhond, Abandoned mine**



**Table No. 4.36**  
**Gypsum Analysis Report- Site S13/34-China Clay mine of Vastabhai, Village**  
**Lakhond, Abandoned mine.**

Parameters	Site No. S13/34 Gypsum sample at china clay mines, Lakhond village	
	Lat: 23°15'50.67"N	Long: 69°47'26.95"E
pH	8.33	
SiO <sub>2</sub> , %	0.16	
Al <sub>2</sub> O <sub>3</sub> , %	1.13	
Fe <sub>2</sub> O <sub>3</sub> , %	18.484	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O , %	63.5	
<b>TCLP Parameters</b>		
Lead , mg/l	BDL	
Cadmium , mg/l	BDL	
Mercury , mg/l	BDL	
Chromium , mg/l	BDL	
Arsenic , mg/l	BDL	
Selenium , mg/l	BDL	
<b>STLC Parameters</b>		
Copper , mg/l	0.556	
Nickel , mg/l	1.850	
Antimony , mg/l	BDL	
<b>D/W Extract Parameters</b>		
Ammonia , mg/l	1.5	
Cyanide , mg/l	BDL	



**Table No. 4.37**  
**Soil Analysis Report- Site S13/34-China Clay mine of Vastabhai, Village**  
**Lakhond, Abandoned mine.**

Parameters	Site No. S13/34 soil sample for Reference at Clay mines, Lakhond Village 2 mt away from site	
	Lat: 23°15'40.31"N	Long: 69°47'20.03"E
Moisture %	4.30	
pH	9.18	
Conductivity, mS/cm	0.810	
Calcium, g/kg	4.48	
Sodium, g/Kg	5.2	
Potassium, g/Kg	1.8	
Sulphate, g/Kg	0.33	
Ammonia, g/Kg	0.014	
Copper, g/Kg	0.013	
Nickel, g/Kg	0.003	
Zinc, g/Kg	0.007	
Cadmium, g/Kg	BDL	
Lead, g/Kg	0.02	
Chromium, g/Kg	0.02	
Manganese, g/Kg	0.10	
Cobalt, g/Kg	0.008	
Gypsum as CaSO <sub>4</sub> .2H <sub>2</sub> O, %	BDL	



**Table No. 4.38**  
**Ground Water Analysis Report- Site S13/34-China Clay mine of Vastabhai,**  
**Village Lakhond, Abandoned mine.**

Parameter	Unit	Site No. S13/34 Borewell at Bhimjibhai, Village Lakhond 10 mt away from site	
		Lat: 23°15'40.30"N	Long: 69°47'21.33"E
pH @ 25 °C	-	7.00	
Color	pt. Co	BDL	
EC	mS/cm	4.377	
Total Hardness	mg/L	750	
TDS	mg/L	3026	
COD	mg/L	BDL	
BOD	mg/L	BDL	
Chloride	mg/L	1285	
Sulphates	mg/L	473	
Ammonical nitrogen	mg/L	0.33	
Iron	mg/L	BDL	
Zinc	mg/L	0.96	
Total Chromium	mg/L	BDL	
Fluoride	mg/L	1.35	
Nitrate	mg/L	1.2	
Calcium	mg/L	144.3	
Magnesium	mg/L	94.8	
Sodium	mg/L	104	
Potassium	mg/L	42	
SAR	%	1.65	
Lead	mg/L	BDL	
Sulphide	mg/L	BDL	



## 5.0 CONCLUSION

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OUTCOME OF THE STUDY REPORT IS PRESENTED HEREUNDER:

### GYPSUM QUALITY ASSESSMENT:

1. Gypsum results indicates that, the gypsum content varies from 58.9 to 69.7 and pH varies from 7.74 to 8.42. The heavy metals concentration in gypsum is as per TCLP and STLC as specified in the Schedule -II -Class A, of HW (Management and Transboundary Movement) Rules-2016, is well within limit.
2. It may be noted that MoEF has removed Gypsum from the Hazardous Waste category and it is categorized as non-hazardous. Thus, it is further affirmed that Gypsum is not Hazardous Waste.
3. Some of the proven facts about Gypsum are presented hereunder:
  - The chemical formula of Gypsum is  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ , it basically comprises of Calcium and Sulphur. Both Calcium and Sulphur are secondary major plant nutrient in soil. There exist, their minimum critical levels in the soil for plant growth, but there is no upper limit standards.
  - It is proven that, Gypsum plays an important role in agriculture as a soil additive, conditioner and fertilizer. It helps loosen up compact or clay soil, and provides calcium and sulfur, which are essential for the healthy growth of a plant.
  - Gypsum is also used as a soil amendment material for treating alkaline soil to remove excessive content of sodium. Gypsum replaces the sodium from the exchange complex. The sodium so replaced with calcium of gypsum is removed through leaching of the soil. The soils treated with Gypsum become dominated with calcium in the exchange complex can also be used for removing sodium from soils having excess salinity.
  - Adding Gypsum to the soil increases ability of the soil to soak up water after precipitation, thus reducing run off. Also, addition of Gypsum does not significantly alter the physical properties of Soil.

### SOIL QUALITY ASSESSMENT:

1. The general topography of the area near the project site is plain terrain towards Northern direction of the site and hilly in southern direction. The site area is undulating.



2. The soil quality in the region, as per **Groundwater Brochure Kachchh District by CGWA**, is sandy to loamy sand in texture dominated by coarse sand. These are non-calcareous, neutral to alkaline in reaction with poor base saturation. They are affected due to salt accumulation. From fertility point of view, they are poorly supplied with plant nutrients and, as such, support the crops with short duration and less water requirement.
3. The soil analysis report indicates that soil quality in and around the 13 sites is in line with the soil quality pattern of the region. The main features are as follows:
  - The pH values in soil ranges from 7.7 to 9.5, indicating neutral to alkaline soils.
  - The EC values in soil ranges from 0.16 to 4.08 mS/cm, indicating average to harmful to crops soil (i.e. sensitive to salts).
  - The Mineral content in soils, i.e. major primary and secondary plant nutrients viz. Calcium, Sodium, Potassium, Manganese and Sulphur ranges from 48 to 950 g/kg, 1.6 to 17.6 g/kg, 0.4 to 5.6 g/kg, 0.06 to 1.3 g/kg and 0.18 to 10.05 g/kg respectively. These values are well above the critical values required for the plant growth as per "Method Manual, Soil Testing in India, Department of Agriculture & Cooperation, Ministry of Agriculture, GOI. It may be noted that there exist no upper limit of these plant nutrients in soil.
  - The micro nutrient content viz. Zinc, Copper and Cobalt ranges from 0.007 to 0.1 g/kg, 0.01 to 0.06 g/kg and 0.005 to 0.044 g/kg respectively. These values are well below the screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines" Guidance document for assessment and remediation of contaminates sites in India, 2015".
  - The metal content in the soil viz. Cadmium, Chromium, Nickel and Lead ranges from 0.00, 0.01 to 0.07 g/kg, 0.003 to 0.05 g/kg and 0.01 to 0.02 g/kg respectively. These values are well below the screening and responsive levels specified by Ministry of Environment and Forest, New Delhi in their guidelines" Guidance document for assessment and remediation of contaminates sites in India, 2015". Copy of same guideline are attached as an **Annexure-5.1**.
4. From the soil quality analysis and assessment in all the 13 sites, it is inferred that there is no adverse impact on the surrounding soil quality due to Gypsum.

At few locations viz. S1, S4 & S11, low elevated levels of primary and secondary major plant nutrients viz. Sodium, Potassium, Calcium and Sulfate were observed compared to virgin soil samples.

This could be due to mixing of Gypsum with the native soils, as the sampling sites are adjacent to the Gypsum site. This will not have any detrimental effect on surrounding soil quality. It may be noted that, Potassium is a major group-II primary nutrient, Calcium and Sulphur are secondary major plant nutrients in soil and they are categorized as essential nutrients for plant growth.



### **GROUND WATER QUALITY ASSESSMENT:**

1. Ground water samples were collected in and around 13 Gypsum disposal sites based on available water samples.
2. The Ground water quality assessment indicates that, quality of majority of borewells is at par with IS:10500. At some of the places elevated levels of TDS and Hardness are observed. This is as per the ground water quality pattern of the region.
3. The ground water quality analysis results indicate that a S9 site location Ammonical Nitrogen is slightly high levels.

The probable cause of this could be sewage intrusion with the ground water, as in nearby vicinity of these sites residential area exist and having septic tank/soak pit as a sewage disposal mode.

### **CONCLUSION:**

Based on our study and analysis it is concluded that the Gypsum at these 13 sites is practically difficult to lift and is not having any adverse impacts on surrounding soil or ground water quality. As such Gypsum contains major secondary plant nutrient required for plant growth in soil viz. Calcium and Sulphur. However, these sites can be ameliorated by following measures:

- 1 Local top soil cover of 6-8 inch can be laid over these sites and where possible suitable vegetation viz. neem, gulmahor can be planted.
- 2 The unit shall monitor the Ground Water and soil quality at regular interval near the gypsum site and maintain analysis report. And submit the same to the statutory authority.



# ANNEXURE



# ANNEXURE 1.1

## Copy of CC&A Order



### GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN  
Sector-10-A, Gandhinagar 382 010  
Phone : (079) 23222425  
(079) 23232152  
Fax : (079) 23232156  
Website : www.gpcb.gov.in  
By R.P.A.D.

In exercise of the power conferred under section-25 of the Water (Prevention and Control of Pollution) Act-1974, under section-21 of the Air (Prevention and Control of Pollution)-1981 and Authorization under rule 6(2) of the Hazardous & Other Waste (Management & Transboundary Movement) Rules-2016, framed under the Environmental (Protection) Act-1986. The board has granted the consent vide order no. PC/CCA-KUTCH-27(7)/GPCB ID-17774/406201, date: 04/03/2017.

And whereas Board has received application inward No. 136381 dated 16/04/2016 for the Renewal Consolidated Consent and Authorization (CC&A) of this Board under the provisions / rules of the aforesaid Acts. Consents & Authorization are hereby granted as under:

#### CONSENTS AND AUTHORISATION:

(Under the provisions / rules of the aforesaid environmental acts)

To  
Ashapura Perfoclay Ltd,  
Survey No. 167,  
Vill: Ler, Nr. Bhujodi,  
Anjar Bhuj Highway,  
Tal: Bhuj,  
Dist: Kutch.

- Consent Order No. AWH-93521 Date of Issue: 11/06/2018.
- The consent shall be valid up to 24/06/2023 for manufacture of the following products:

Sl. No.	Product	Quantity per Month
1.	Bleaching Clay	12,000 MT

#### SUBJECT TO THE FOLLOWING SPECIFIC CONDITIONS

- You shall comply with all conditions of Environment Clearance issued vide letter no. SE/AA/GU/JEC/2(b)/497/2016, dated 30/07/2016.
- No ground water shall be withdrawn without obtaining prior permission from competent authority.
- You shall operate Effluent Treatment Plant regularly and efficiently.
- The gypsum generated from neutralising spent acid shall be disposed in environmentally sound manner.



3. CONDITIONS UNDER WATER ACT 1974:

3.1 The source of water shall be GWIL (Gujarat Water Infrastructure Ltd.).

3.2 The total industrial and domestic water consumption shall not exceed 838 KL/day.

3.3 The quantity of industrial effluent from manufacturing process and other ancillary operations shall not exceed 550 KL/day.

3.4 The quantity of the domestic waste water (Sewage) shall not exceed 6 KL/day.

3.5 The quality of the industrial effluent shall conform to the following standards.

PARAMETER	PERMISSIBLE LIMIT
pH	6.5 to 8.5
Temperature	40°C
Colour (Pt. Co. scale units)	100 units
Suspended Solids	100 mg/L
Oil & Grease	10 mg/L
Phenolic Compound	01 mg/L
Ammonical Nitrogen	50 mg/L
BOD (3 Days at 27°C)	30 mg/L
COD	100 mg/L
Chlorides	600 mg/L
Sulphates	1000 mg/L
Total Dissolved Solids	2100 mg/L
Sodium Absorption Ratio	26
Percent Sodium	60 %
Sulphides	02 mg/L
Total Chromium	02 mg/L
Hexavalent Chromium	0.1 mg/L
Copper	03 mg/L
Lead	0.1 mg/L
Mercury	0.01 mg/L
Nickel	03 mg/L
Zinc	05 mg/L
Cadmium	02 mg/L
Cyanides	0.2 mg/L
Arsenic	0.2 mg/L
Fluorides	02 mg/L

All efforts shall be made to remove colour & unpleasant odour as far as practicable.

3.6 The treated effluent @ 180 KL/day conforming to standards mentioned in 3.5 shall be used in gardening and plantation within premises.

3.7 The treated effluent @150 KL/day shall be reused in the process.





## GUJARAT POLLUTION CONTROL BOARD

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- 3.8 The R.O. reject @ 220 KL/day shall be send to solar evaporation pond.
- 3.9 The applicant shall develop green belt area scientifically to utilize 180 KLD after achieving norms as mentioned in condition no. 3.5.
- 3.10 The pipeline network shall be proper and adequate for utilization of treated wastewater for gardening and plantation. Also adequate storage and handling of treated wastewater shall be developed.
- 3.11 Regular maintenance of pipes and pumps shall be done, such that there shall be no chock up in lines or failures of pumps.
- 3.12 The distribution of flow shall be maintained for plantation in such a way that there shall not be any ponding.
- 3.13 Records of plantation and growth rate shall be maintained and submitted to Regional Office, Kutch (West) and Head Office, Gandhinagar. Skilled person / in charge shall be nominated for specially this activity.
- 3.14 Sewage shall be disposed off through septic tank / soak pit system.

#### 4. CONDITIONS UNDER AIR ACT 1981:

- 4.1 The following shall be used as fuel in proposed Steam Boilers/D. G Set and Dryer as following rates:

Sr. No.	Fuel	Quantity
1.	Coal	15 MT/day
2.	Furnace Oil	0.8 MT/day
3.	High Speed Diesel	120 Liter/Hour

- 4.2 The applicant shall install & operate air pollution control system in order to achieve flue gas emission norms as prescribed below.

Sr. no.	Stack attached to	Stack height in Meters	APCM	Parameter	Permissible limit
1.	Boiler -1 & 2 (3 MT/hr-each)	33	Multi Cyclone followed by Bag Filter	PM SO <sub>2</sub> NO <sub>x</sub>	150 mg/Nm <sup>3</sup> 100 ppm 50 ppm
2.	Boiler-3 (3 MT/hr)	33	Multi Cyclone followed by Bag Filter		
3.	Boiler-4 (3 MT/hr)	33	Multi Cyclone followed by Bag Filter		
4.	D.G. Set (500 KVA)	11	Adequate Stack Height		
5.	D.G. Set (250 KVA) stand by	11	Adequate Stack Height		

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Sr. no.	Stack attached to	Stack height in Meters	APCM	Parameter	Permissible limit
6.	D.G. Set (630 KVA) stand by	11	Adequate Stack Height		

4.3 The applicant shall install & operate air pollution control system in order to achieve process gas emission norms as prescribed below:

Sr. No.	Stack attached to	Stack height in Meters	APCM	Parameter	Permissible limit
1.	Pulverizer - 1 & 2	18	Cyclone Separator and Bag Filter	PM	150 mg/Nm <sup>3</sup>
2.	Pulverizer - 3	15	Cyclone Separator and Bag Filter		
3.	Pulverizer - 4	15	Cyclone Separator and Bag Filter	PM	150 mg/Nm <sup>3</sup>
4.	Pulverizer - 5 (6 MT/hour)	15	Cyclone Separator and Bag Filter		
5.	Pulverizer - 6 (6 MT/hour)	15	Cyclone Separator and Bag Filter	PM	150 mg/Nm <sup>3</sup>
6.	De Dusting system -1	15	Cyclone Separator and Bag Filter		
7.	Classifier	15	Bag Filter		
8.	Floor Cleaner	15	Bag Filter		
9.	Dryer - 1	18	Cyclone Separator and water Scrubber	PM	150 mg/Nm <sup>3</sup>
10.	Dryer - 2	18	Cyclone Separator and water Scrubber		
11.	Dryer - 3	18	Cyclone Separator and water Scrubber		





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Sr. No.	Stack attached to	Stack height in Meters	APCM	Parameter	Permissible limit
12.	Dryer - 4 Stand by	18	Cyclone Separator and water Scrubber		
13.	Dryer - 5	18	Cyclone Separator and water Scrubber		
14.	Dryer - 6	18	Cyclone Separator and water Scrubber		
15.	Dryer - 7	18	Cyclone Separator and water Scrubber		
16.	Hot Air Generator attached with dryer -5	20	Cyclone Separator		

- 4.4 The concentration of the following parameters in the ambient air within the premises of the industry shall not exceed the limits specified hereunder as per National Ambient Air Quality Standards issued by MoEF&CC dated 18th November-2009.

Sr. No.	Pollutant	Time Weighted Average	Concentration in Ambient air in $\mu\text{g}/\text{m}^3$
1.	Sulphur Dioxide ( $\text{SO}_2$ )	Annual	50
		24 Hours	80
2.	Nitrogen Dioxide ( $\text{NO}_2$ )	Annual	40
		24 Hours	80
3.	Particulate Matter (Size less than $10 \mu\text{m}$ ) OR $\text{PM}_{10}$	Annual	60
		24 Hours	100
4.	Particulate Matter (Size less than $2.5 \mu\text{m}$ ) OR $\text{PM}_{2.5}$	Annual	40
		24 Hours	60

- 4.5 The applicant shall provide portholes, ladder, platform etc. at chimney(s) for monitoring the air emissions and the same shall be open for inspection. The chimney(s) vents attached to various sources of emission shall be designed by numbers such as S-1, S-2, etc. and these shall be painted / displayed to facilitate identification.
- 4.6 The concentration of Noise in ambient air within the premises of industrial unit shall not exceed following levels:

Between 6 A.M. to 10 P.M.: 75 dB (A)

Between 10 P.M. to 6 A.M.: 70 dB (A)

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**5. Authorization under Hazardous & Other Waste [Management & Transboundary Movement] Rules, 2016 & amended.**

5.1 Authorization Number AWH – 93521 and shall valid up to 24/06/2023

5.2 Ashapura Perfoclay Ltd. is hereby granted an authorization to operate facility for following hazardous wastes after expansion on the premises situated at, Survey No: 167, Vill:- Ler, Nr: Bhujodi, Anjar Bhuj Highway, Bhuj, Dist - Kutch.

Sr. No.	Waste	Quantity per Year	Category	Mode of Disposal
1	ETP Sludge	0.22 MT	35.3	Collection, storage, Transportation & disposal at TSDF
2	Sludge From Wet Scrubbers	8.50 MT	37.1	Collection, storage, Transportation and send to Sanghi industry for co-processing
3	Used Oil	100 Litre	5.1	Collection, storage, Transportation & Disposal by selling out to authorized recyclers.
4	Spent Acid	66000 MT	B15- II	Collection, storage, neutralize within factory premises and generated gypsum shall be send to cement industry for co-processing
5	Evaporation Residue	1.0 MT	37.3	Collection, storage, Transportation & disposal at TSDF

5.3 The disposal mode for spent acid, as per EC condition the spent acid shall be neutralize within factory premises and generated gypsum shall be send to cement industry for co-processing.

5.4 The authorization is granted to operate a facility for collection, storage, within factory premises, transportation, and ultimate disposal of Hazardous wastes by selling out to authorized recyclers and disposal at TSDF.

5.5 The authorization is subject to the conditions stated below and such other conditions as may be specified in the rules from time to time under the Environment (Protection) Act-1986.

**5.6 TERMS AND CONDITIONS OF AUTHORISATION:**

1. The authorized person shall comply with the provisions of the Environment (Protection) Act, 1986, and the rules made there under.
2. The authorization or its renewal shall be produced for inspection at the request of an officer authorized by the State Pollution Control Board.
3. The person authorized shall not rent, lend, sell, transfer or otherwise transport the hazardous and other wastes except what is permitted through this authorization.
4. Any unauthorized change in personnel, equipment or working conditions as mentioned in the application by the person authorized shall constitute a breach of his authorization.





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5. The person authorized shall implement Emergency Response Procedure (ERP) for which this authorization is being granted considering all site specific possible scenarios such as spillages, leakages, fire etc. and their possible impacts and also carry out mock drill in this regard at regular interval of time.
6. The person authorized shall comply with the provisions outlined in the Central Pollution Control Board guidelines on 'Implementing Liabilities for Environmental Damages due to Handling and Disposal of Hazardous Waste and Penalty'.
7. It is the duty of the authorized person to take prior permission of the State Pollution Control Board to close down the facility.
8. The imported hazardous and other wastes shall be fully insured for transit as well as for any accidental occurrence and its clean-up operation.
9. The record of consumption and fate of the imported hazardous and other wastes shall be maintained.
10. The hazardous and other waste which gets generated during recycling or reuse or recovery or pre-processing or utilization of imported hazardous or other wastes shall be treated and disposed of as per specific conditions of authorization.
11. The importer or exporter shall bear the cost of import or export and mitigation of damages if any.
12. An application for the renewal of an authorization shall be made as laid down under these Rules.
13. Any other conditions for compliance as per the Guidelines issued by the Ministry of Environment, Forest and Climate Change or Central Pollution Control Board from time to time.
14. Annual return shall be filed by June 30th for the period ensuing 31st March of the year.

### 6. GENERAL CONDITIONS: -

- 6.1 Unit shall develop green belt within premises as per the CPCB guidelines. However, if the adequate land is not available within premises, the unit shall tie up with local agencies like gram panchayat, school, social forestry office etc. for the plantation at suitable open land in nearby locality and submit an action plan of plantation for next three years to GPCB.
- 6.2 Adequate plantation shall be carried out all along the periphery of the industrial premises in such a way that the density of plantation is at least 1000 trees per acre of land and a green belt of 10 meters width is developed.
- 6.3 The applicant shall have to submit the returns in prescribed form regarding water consumption and shall have to make payment of water cess to the Board under the Water (Prevention and Control of Pollution) Cess Act- 1977.
- 6.4 In case of change of ownership/management the name and address of the new owners/partners/directors/proprietor should immediately be intimated to the Board.

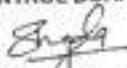
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- 6.5 The applicant shall however, not without the prior consent of the Board bring into use any new or altered outlet for the discharge of effluent or gaseous emission or sewage waste from the proposed industrial plant. The applicant is required to make applications to this Board for this purpose in the prescribed forms under the provisions of the Water (Prevention and Control of Pollution) Act-1974, the Air (Prevention and Control of Pollution) Act-1981 and the Environment (Protection) Act-1986.
- 6.6 The overall noise level in and around the plant area shall be kept well within the standards by providing noise control measures including engineering control like acoustic insulation hoods, silencers, enclosures etc on all sources of noise generation. The ambient noise level shall conform to the standards prescribed under the Environment (Protection) Act, 1986 & Rules.
- 6.7 Applicant is required to comply with the manufacturing, Storage and Import of Hazardous Chemicals Rules-1989 framed under the Environment (Protection) Act-1986.
- 6.8 If it is established by any competent authority that the damage is caused due to their industrial activities to any person or his property in that case they are obliged to pay the compensation as determined by the competent authority.
- 6.9 Applicant shall have to comply with all the guidelines / Directive issued / being issued by MoEF&CC / CPCB / DoEF from time to time.
- 6.10 Applicant shall not use/withdraw ground water either during construction and /or operation phase.
- 6.11 Environmental cell shall be setup and shall be responsible for the total Environmental management.
- 6.12 Monitoring in respect to Air, Water, Noise level shall be carried out and results shall be submitted to GPCB on quarterly basis.

For and on behalf of  
GUJARAT POLLUTION CONTROL BOARD

  
(Sushil Vegda)  
Senior Environment Engineer

NO: PC/CCA-KUTCH-27(7)GPCB ID - 17774/

Date:

ISSUED TO:  
Ashapura Perfoclay Ltd,  
Survey No. 167,  
Vill: Ler, Nr. Bhujodi,  
Anjar Bhuj Highway,  
Tal. Bhuj, Dist. Kutch.



## CC&A Amendment Order



### GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN

Sector-10-A, Gandhinagar 382 010

Phone : (079) 23222425

(079) 23232152

Fax : (079) 23232156

Website : www.gpcb.gov.in

By R.P.A.D.

#### AMENDMENT TO CONSENTS AND AUTHORISATION

To  
M/s. Ashapura Perfoclay Ltd,  
Survey No. 167, 163 & 164  
VIII-1er, Nr. Bhujodi,  
Anjar Bhuj Highway,  
Tal: Bhuj,  
Dist: Kutch

Subject : Amendment to Consolidated Consent and Authorisation (CC&A)  
Reference : 1) CCA order no AWH-03521 vide letter no PC/CCA-KUTCH  
27(7)-GPCB ID - 7774/489190, date 20/09/2018  
2) Your CCA Amendment Application- Inward ID No. 181357 dated  
15/07/2018

Sir

In exercise of the power conferred under section-27 of the Water (Prevention and Control of Pollution) Act-1974 under section-21 of the Air (Prevention and Control of Pollution)-1981 and Authorization under rule 6(2) of the Hazardous & Other Waste (Management & Transboundary Movement) Rules-2016 & as amended framed under the Environmental (Protection) Act-1986 and without reducing your responsibility under the said Acts/Rules in anyway this Board is empowered to amend consent order conditions Accordingly the Consolidated Consent and Authorisation (CC&A) issued vide letter no: PC/CCA-KUTCH - 27(7)/GPCB ID 17774/489190, dated 20/09/2018 which is valid up to 24/06/2023 under reference (1) stands amended in respect of the following conditions.

1. Consent Order No.: H-103222, Date of Issue: 29/07/2019.
2. The consent order shall be valid up to 24/06/2023.
3. There shall be no change in production capacity, water consumption, waste water generation, fuel consumption and hazardous waste generation due to proposed amendment.
4. This CCA Amendment is granted only for the alternate mode of disposal of gypsum waste generated from neutralization of spent acid, to mines back filling in the abandoned mines only when cement industries are not in operation and / or not accepting the gypsum for co-processing with following specific conditions.

#### SUBJECT TO THE FOLLOWING SPECIFIC CONDITIONS:

1. Unit shall comply with the conditions of the Environment Clearance granted by the competent authority.

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2. Unit shall approach other cement industries for sending gypsum waste for re-processing.
3. Unit shall submit the data when the cement industry is not accepting the gypsum for re-processing along with the document from the same industry.
4. The gypsum waste generated from neutralization of dilute spent acid by using fresh hydrated lime only be disposed at mines back filling to the abandoned mines of M/s. Ashapura Minocem Ltd. (Mata no Madh exhausted carbonate mines) (OL no. 3543) located at survey no. 189 Traversa paki, Ta. Lakhot Dist. Kutch having Latitude Longitude as N 23° 30' 09.3" E 68° 56' 34.6".
5. The filtered cake of gypsum shall be stored at the dedicated storage area having proper lining and leachate collection system such that there is no seepage.
6. Unit shall analyse the generated gypsum at regular interval of the process and shall submit the analysis report of the same to this office and to the regional office Kutch (West).
7. Unit shall provide impervious liner with adequate thickness after leakage test in the mines before disposing the gypsum waste.
8. Unit shall provide impervious liner system possessing adequate physical, chemical and mechanical properties to prevent failure due physical contact with gypsum or leachate or diastatic condition or hydrostatic uplift pressure and stresses which may arise due to stacking of the gypsum.
9. All the joints of the liner prior to commencement shall be tested for leakages.
10. Unit shall provide dedicated transportation facility.
11. The vehicles use for the transportation of the gypsum waste shall be registered under Motor Vehicle Act - 1988 and dedicated only for collection and transportation of gypsum waste.
12. The vehicles used for transportation shall be covered properly with tarpaulin sheets.
13. In no case there shall be spillage of the gypsum while handling and transportation of the gypsum. In case of any spillage of gypsum waste while transporting, it shall be sole responsibility of unit for cleaning such spillages.
14. Unit shall take adequate steps to control fugitive emission while handling and transportation of gypsum.
15. Unit shall monitor the ground water quality at regular interval at the mines where gypsum waste is to be back filled i.e. M/s. Ashapura Minocem, Lakhot, Kutch and submit the analysis report to this office.



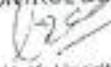


## GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN  
Sector-10-A, Gandhinagar 382 010  
Phone : (079) 23222425  
(079) 23232152  
Fax : (079) 23232156  
Website : www.gpcb.gov.in

16. In no case the ground water shall be affected due to back filling of the gypsum in the mines.
  17. Unit shall maintain the record of the generation and disposal of gypsum. Unit shall submit monthly data of the same to this office and regional office, Kutch (West)
  18. Unit shall prepare contingency plan and suitable remedial measures shall be taken to have no impact on environment.
  19. In no case gypsum shall be dumped outside the designated area.
  20. Unit shall be held responsible if illegal dumping of the gypsum waste is observed at any other places.
  21. Unit shall comply with the closure mining plan.
  22. Unit shall carry out Ambient Air Quality Monitoring near the industry and also at the mines.
  23. Unit shall increase the green belt area i.e. tree area within and at periphery of the premises.
  24. Unit shall also develop green belt area at abandoned mines where gypsum waste to be backfilled.
  25. Unit shall be responsible for the final closure of the mines and shall cover with the top soil and plantation.
5. The other terms and condition of DCA order no. AWH-93521, vide letter no. PC/CCA-KUTCH - 27(7)/GPCB ID 17774/469150, date 20/09/2018 shall remain unchanged.

For and on behalf of  
GUJARAT POLLUTION CONTROL BOARD

  
(Smt. U. K. Upadhyay)  
Environment Engineer

NO. PCI CCA- KUTCH- 27(15)/GPCB ID - 17774/ Date:

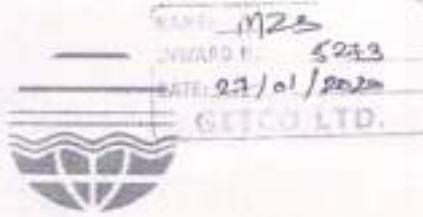
ISSUED TO:  
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Vill: Lar, Nr. Bhujodi,  
Anjar Bhuj Highway,  
Tal: Bhuj,  
Dist: Kutch

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**Clean Gujarat Green Gujarat**  
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**ANNEXURE 1.2**  
**COPY OF RECOGNIZED SCHEDULE-I ENVIRONMENT**  
**AUDITOR OF GPCB**



**GUJARAT POLLUTION CONTROL BOARD**  
**Paryavaran Bhavan**  
Sector - 10 A, Gandhinagar - 382 010.  
Environment Audit Cell

No. GPCB/EA-115(1)/ 552877

22 JAN 2020 RPAD

To,  
M/s. Gujarat Industrial and Technical Consultancy Organization Limited (GITCO)  
"GITCO House" Opp. Sardar Patel Stadium,  
Stadium Road, Navrangpura,  
Ahmedabad - 380 009

**Sub:-** Amendment in Recognition as Schedule- I Environmental Auditor,  
**Ref:-** GPCB/EA-115(1)/493335 dated 01/02/2019

Sir,

This refers to your application for the recognition as Environmental Auditor, subsequent interview and visit of your Laboratory by Environment Audit Committee members. It is recommended by the Environment Audit Committee members, to recognize your firm as Schedule-I Environmental Auditor for carrying out the Environmental Audit under Environment Audit Scheme with following conditions.

- 1) Recognition is valid upto 31/12/2020.
- 2) You shall have maximum One team for the Environment Audit.
- 3) You shall carry out maximum 15 nos. of Environment Audit.
- 4) Team members shall be as under :

Sr. No.	Name	Designation
1	Mrs. Mehjabin Shaikh	Environment Engineer
2	Mr. Nirav Shah	Chemical Engineer
3	Ms. Bhavesh Shah	Chemist
4	Ms. Zalak Khambhata	Microbiologist

- 5) You shall prepared and submit the Environment Audit report and to comply the conditions for Environment Auditors as per the Hon'ble High Court order dated 20/12/1996, 13/03/1997, 16/09/1999, and also the Guidelines prepared by Gujarat Pollution Control Board in this regard, for the Environment Audit Scheme along with the Adequacy and Efficacy certificates as per prescribed format.
- 6) Environment Audit Report shall be submitted in prescribed format.

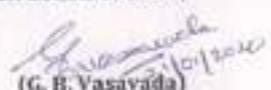
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- 7) You shall apply for renewal of Environmental Auditor 3 months before expiry of the recognition with the scrutiny fees to this Board.
- 8) This recognition is subject to periodic evaluation of your facility and subject to change based on performance.
- 9) In case of change in man power, team member or any other suggestion, recommendation or any issue, you shall appear before the Environment Audit Committee.

This letter is issued with the permission of competent authority.

For and on behalf of GPCB,

  
(G. B. Vasavada)  
Scientific Officer



## **GUJARAT INDUSTRIAL AND TECHNICAL CONSULTANCY ORGANISATION LIMITED (GITCO)**

GITCO – a premier Technical Consultancy Organisation (TCO) - provides consulting services to accelerate the growth of industrial and services economy of Gujarat. For the last 40 years, with committed hard work, the GITCO Professional Team has won the trust of Ministries and Departments of the Government, Multi-lateral Agencies, Financial Institutions, Industry Associations and the ubiquitous Gujarati businessmen.

- "GITCO" a multidisciplinary consultancy organization.
- A board spectrum of Project management, Financial, Industrial, Technical, and Environmental consultancy services under one roof.
- Unique combination of institutional support, direct interaction with the private sector and professionalism.
- "GITCO" an organization offering high quality and reliable consultancy services in fast changing economic & business scenario.

The inherent Gujarati insight and business acumen along with professional inputs enable us to give innovative perspectives in our consulting assignments. Currently, we offer our services for generic as well as niche areas aimed to ensure balanced growth and development.

The organization's most important resource is its manpower. It has a strong team of 36 dedicated employees of which 20 are highly qualified and experienced technical / management / finance specialists. GITCO team of professionals is in a position to meet Consultancy needs of diverse industry disciplines: Engineering / Chemical / Plastic / Pharmaceutical / Environment / Textile / Information Technology / Food and Agro-processing etc. The company has, to support its in-house professional manpower, a panel of over 50 external experts specializing in core technical and managerial areas.

GITCO has well developed independent Environment Consultancy Cell with professional manpower and well-equipped laboratory.

### **Services Provided by Environment Management Cell of GITCO: -**

GITCO in the field of environment is capable of handling multifarious assignments like Regional Carrying Capacity Assessment, Environmental Impact Assessment Study, Site Assessment Study, Contamination Study, Environmental Audit and various assignment related with pollution control activities. With its exclusive and professional manpower, which being the backbone, it has successfully delivered various assignments for reputed private as well as Government Institute across the country.

GITCO offers expertise laboratory services to clients in all the environmental & analytical modules for regulatory Compliances. GITCO operates its own NABL accredited laboratory. The Analytical Laboratory offers a comprehensive



line of testing & sampling with its key focus being Accurate, Meticulous & Reproducible results. With covering relevant physical and chemical parameters for analysis of pollutants in air, water, wastewater, sludge and soil. GITCO also carries out treatability studies for water and wastewater.

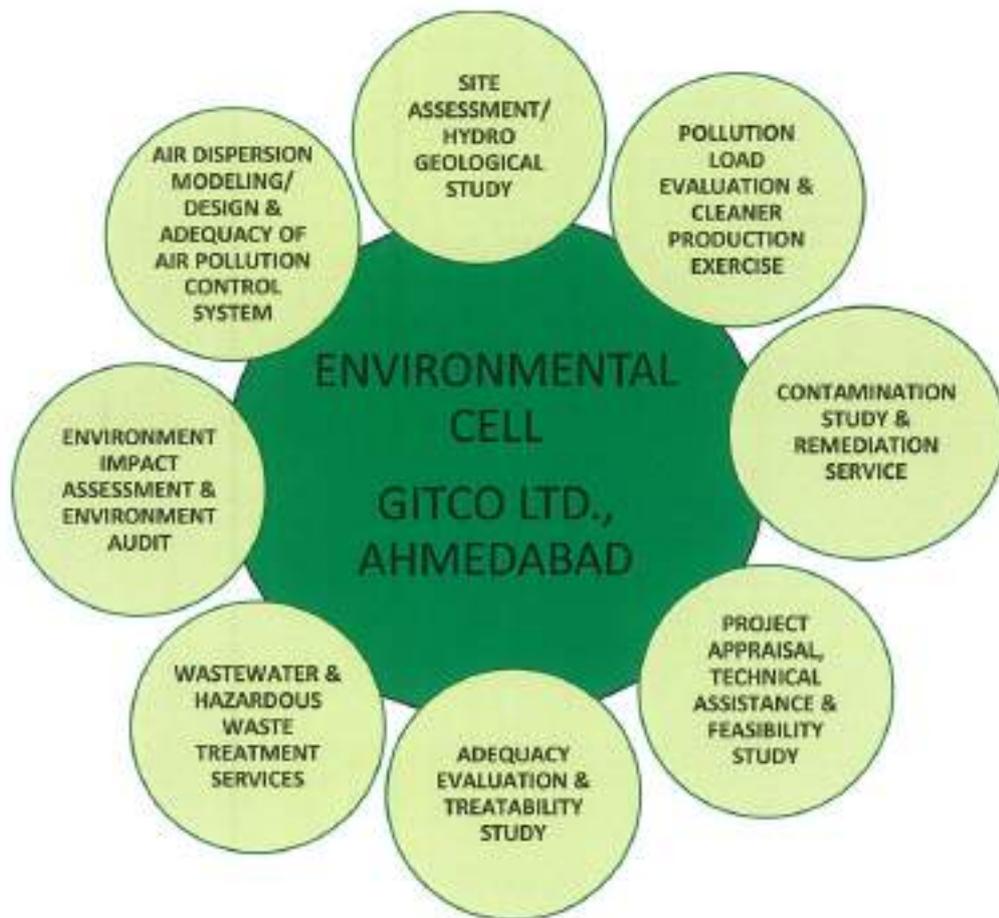
GITCO is a Schedule-I Environmental Auditor of Gujarat Pollution Control Board and also Ministry of Environment and Forest approved authorized consultant for project appraisal of common environmental facilities.

Clientele include Public Sector Enterprises, Private Industries, Multinationals, Ministry of Environment and Forest, State Pollution Control Boards across several prestigious projects. Several Fortune 500 clients regularly work with GITCO Ltd.

**The services offered by Environmental cell is as follows:**

1. Environment Impact Assessment Study
2. Environment audit as per environment audit scheme promulgated by honourable high court of Gujarat & GPCB (GITCO is recognized auditor for schedule-I & II industries)
3. Regional Carrying Capacity Assessment
4. Adequacy Evaluation of Environmental management system
5. Treatability Study
6. Hydro Geomorphological study
7. Site Assessment and Contamination Study
8. Project appraisal, Feasibility study, Technical assessment.
9. Third Party Inspection Study
10. Pollution Load Evaluation and Cleaner Production Exercise
11. Laboratory services
12. Waste water treatment services
13. Hazardous waste treatment services
14. Air Dispersion Modelling
15. Evaluation of boiler efficiency and design adequacy of air pollution control system.





❖ **GITCO has worked on many projects on Contamination Study and site assessment:**

- Contamination Study
- Soil and groundwater investigations
- Hydrogeological Study
- Hazardous Waste landfills
- Third Party Inspection and Monitoring

**The list of projects completed by GITCO under Contaminated Study and Site Assessment are hereunder:**

1

<b>Name of project</b>	∴	<b>Assessment of soil contamination &amp; remedial measures for M/s. Virat Alloys (P) Ltd., Kadi-Kalol road, Gujarat</b>
<b>Year</b>	∴	2020
<b>Project features</b>	∴	<ul style="list-style-type: none"> <li>• Secondary data collection (i.e. Pickling process details &amp; source of sludge)</li> <li>• Site visit &amp; Pickling sludge sample collection</li> <li>• Analysis of Pickling Sludge</li> <li>• Soil quality analysis after removal of sludge from site</li> <li>• Review &amp; Interpretation of results</li> <li>• Observation &amp; Conclusion</li> </ul>
<b>Description of actual services provided within the assignment:</b>		
<p>M/s. Virat Alloys (P) Ltd. is a SS Rolling Mill and generates Pickling Sludge from Effluent Treatment Plant. The unit had disposed the said sludge illegally through tractor in to open plot &amp; As per closure order, the unit has to carryout remediation of contaminated soil by recollecting and disposing hazardous waste at active authorized TSDF site. GITCO was assigned the work of assuring the completion of Remediation. Prior to sample collection, the pit area where sludge was disposed, was visually inspected to assess the absence of any other waste and non-representative material. Sample of Pickling sludge from plant &amp; Soil samples from contaminated site were collected and level of contamination were assessed. The unit was directed to lift the sludge as well as contaminated soil where sludge was dumped.</p>		



<b>Name of project</b>	:	<b>Assessment &amp; remedial measures of contamination to Eradicate/control of Contamination, Swastik Organic, Himmatnagar, Gujarat</b>
<b>Year</b>	:	2019
<b>Project features</b>	:	<ul style="list-style-type: none"> <li>• Geo hydrological &amp; Hydro Geological condition assessment</li> <li>• Assessment of condition of existing wells</li> <li>• Ground water sample collection in &amp; around the existing tube wells</li> <li>• Pump test to know the characteristics of aquifer</li> <li>• Indication of extent of contamination</li> <li>• Suggestion of Remedial measures</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>The unit was engaged in the manufacturing of different Dyes Intermediates from 1982-2004. During this period the unit had duped Iron Sludge on open land near the factory premises. Over these many years the same has contaminated the below surface land and ground water. Contamination of Groundwater, land and surface water due to dumping of the is Iron Sludge was carried out. During this study GITCO has done Soil and Geo Hydrological survey &amp; investigation studies in and around the contaminated plant site of Swastik Organics. The base line data was collected, compiled, analyzed and interpreted to assess the present status of soil and ground water conditions and identifying probable reasons for distribution of pollutant in underground soil and water environment, if any. As per the investigation studies and findings remedial measures were suggested.</p>		



<b>Name of project</b>	:	<b>Geo-Hydrological study related to the ground water, land and surface water contamination for M/s. N R Agrawal, Vapi, Gujarat</b>
<b>Year</b>	:	2018
<b>Project features</b>	:	<ul style="list-style-type: none"> <li>• Geo hydrological &amp; Hydro Geological condition assessment</li> <li>• Assessment of condition of existing wells</li> <li>• Ground water sample collection in &amp; around the existing tube wells</li> <li>• Pump test to know the characteristics of aquifer</li> <li>• Indication of extent of contamination</li> <li>• Suggestion of Remedial measures</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>The company is having Writing, Printing and News Print Paper manufacturing unit at Sarigam. The unit is manufacturing the same from recycled waste paper. It is generating sludge from de-inking process of paper manufacturing. It is generating sludge from de-inking process of paper manufacturing. sludge was found lying in open area within the factory premises by statutory authority. Contamination of Groundwater, land and surface water due to dumping De-inking Sludge was carried out. During this study GITCO has done Soil and Geo Hydrological survey &amp; investigation studies in and around the contaminated plant site. The base line data was collected, compiled, analyzed and interpreted to assess the present status of soil and ground water conditions and identifying probable reasons for distribution of pollutant in underground soil and water environment, if any. As per the investigation studies and findings remedial measures were suggested.</p>		



<b>Name of project</b>	:	<b>Geo-hydrological study of underground water contamination in &amp; around the premises for M/s. Ashapura Perfoclay Ltd., Bhuj, Gujarat</b>
<b>Year</b>	:	2018
<b>Project features</b>	:	<ul style="list-style-type: none"> <li>• Preliminary site visit</li> <li>• Collection of relevant data around the plant area</li> <li>• Sampling &amp; Testing in &amp; around the identified sites to assess the possible effects on Ground water &amp; Soil</li> <li>• Screening, review and comparison of results</li> <li>• Conclusion</li> </ul>
<b>Description of actual services provided within the assignment:</b>		
<p>M/s. Ashapura Perfoclay Ltd. Is involved in the manufacturing of Bleaching Clay, Gypsum is generated from neutralization of this spent sulfuric acid with lime procured from fertilizer company. High concentration of Ammonical nitrogen was found in surrounding bore wells. In this study GITCO has carried out Soil and Geo Hydrological survey &amp; investigation studies in and around the plant site area. The base line data had been collected, compiled, analyzed and interpreted to assess the present status of soil and ground water conditions and identifying probable reasons for distribution of pollutant in underground soil and water environment.</p>		



<b>Name of project</b>	:	<b>An Opinion Regarding Quarry Disposal of Deinking Sludge for M/s. N R Agrawal, Sarigam, Gujarat</b>
<b>Year</b>	:	2019
<b>Project features</b>	:	<ul style="list-style-type: none"> <li>• Secondary data collection (i.e. Manufacturing process, Source of Deinking Sludge &amp; current practice of sludge disposal)</li> <li>• Site visit &amp; Deinking Sludge Sample collection</li> <li>• Analysis of Deinking sludge</li> <li>• Screening, Review &amp; comparison of results</li> <li>• Opinion &amp; Conclusion regarding Quarry disposal of sludge</li> </ul>
<b>Description of actual services provided within the assignment:</b>		
<p>The Deinking Sludge generated from M/s. NR Agrawal Industries Ltd. Was being disposed off by landfilling. A Study was conducted by GITCO Ltd., to determine the characteristics of de-inking sludge and assess its possibilities for safe quarry disposal. GITCO team has visited the site, collected the sample and scrutinized various data related to production and generation, storage and disposal of deinking sludge. Analysis of deinking sludge was done for physico-chemical, AOX and TLCP test for listed metals in schedule-II of Hazardous Waste Management and Handling Rules, 2016(Schedule II). By screening, reviewing the results &amp; studying legal status for disposal of Deinking sludge GITCO gave opinion regarding Quarry disposal of the same.</p>		



<b>Name of project</b>	:	Third Party Inspection for Gujarat Maritime Board (GMB) for operation & maintenance of TSDF site at Alang Ship yard done by M/s. Gujarat Enviro Protection Infrastructure Limited (GEPIL), Surat.
<b>Year</b>	:	2019
<b>Project features</b>	:	<ul style="list-style-type: none"> <li>• Design Adequacy evaluation</li> <li>• Stage wise monitoring of all the existing components</li> <li>• Sampling and Analysis of piezometric bore-well near Landfill site.</li> <li>• Monitoring the ambient air quality for 24 hrs.</li> <li>• Mass balance or to find efficiency of the incinerator in terms of combustion % and fuel effect.</li> <li>• Recommendations for service/repair/replacement of any component</li> <li>• Prepare/ vet/ update Standard Operating Procedure of ETP</li> <li>• Inspection of firefighting system</li> <li>• Inspection of lab for sufficient facilities</li> </ul>
<b>Description of actual services provided within the assignment:</b>		
<p>Gujarat Maritime Board (GMB) is operating TSDF at Alang Shipyard. GMB awarded the work of operation &amp; maintenance of the said TSDF to M/s. Gujarat Enviro Protection Infrastructure Limited (GEPIL), Surat. GMB has awarded the work for Third Party Inspection (TPI) for the said project to GITCO Ltd. GITCO had already carried out TPI of Design &amp; Construction of the said TSDF facility. Checklist of documents/details required particularly related to operations was prepared and field visit was carried out after receiving the said documents. Monitoring &amp; sampling was carried out to assess the site as per the documents provided. Recommendations for improvements were given to GEPIL. After implementation of suggestions, another field visit was conducted &amp; onsite observations were made. Based on the assessment of documents, field observations &amp; analysis results, a complete report was prepared &amp; submitted to GMB.</p>		

<b>Name of project</b>	:	An Opinion Regarding Quarry Disposal of Deinking Sludge for M/s. Shah Paper Mills Ltd.- Unit 3, Vapi, Gujarat
<b>Year</b>	:	2019
<b>Project features</b>	:	<ul style="list-style-type: none"> <li>• Secondary data collection (i.e. Manufacturing process, Source of Deinking Sludge &amp; current practice of sludge disposal)</li> </ul>



	<ul style="list-style-type: none"> <li>• Site visit &amp; Deinking Sludge Sample collection</li> <li>• Analysis of Deinking sludge</li> <li>• Screening, Review &amp; comparison of results</li> <li>• Opinion &amp; Conclusion regarding Quarry disposal of sludge</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>The Deinking Sludge generated from M/s. Shah Paper Mills Ltd. Was being disposed off by landfilling. A Study was conducted by GITCO Ltd., to determine the characteristics of de-inking sludge and assess its possibilities for safe quarry disposal. GITCO team has visited the site, collected the sample and scrutinized various data related to production and generation, storage and disposal of deinking sludge. Analysis of deinking sludge was done for physico-chemical, AOX and TLCP test for listed metals in schedule-II of Hazardous Waste Management and Handling Rules, 2016(Schedule II). By screening, reviewing the results &amp; studying legal status for disposal of Deinking sludge GITCO gave opinion regarding Quarry disposal of the same.</p>	

8

<b>Name of project</b>	:	<b>Geo-hydrological study of underground contamination in &amp; around the premises of M/s. Troikaa Pharmaceutical Limited, Thol, Gujarat</b>
<b>Year</b>	:	2013
<b>Project features</b>	:	<ul style="list-style-type: none"> <li>• Preliminary site visit</li> <li>• Collection of relevant data around the plant area</li> <li>• Assessment of soil at surface and at the depth of 10 m</li> <li>• Collection &amp; Testing of water samples from existing tubewells</li> <li>• Analysis of variation in water quality of upper/ deeper aquifer</li> <li>• Conclusion</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>M/s. Troikaa Pharmaceuticals Ltd. Is involved in the Pharmaceuticals formulation. GPCB directed the unit to carryout detailed study of underground contamination as their discharge of untreated wastewater was into underground well. The base line data was collected, compiled, analyzed and interpreted to assess the present status of soil and ground water conditions and identifying probable reasons for distribution of pollutant in underground soil and water environment. GITCO has carried out Soil and Geo Hydrological survey &amp; investigation in and around the plant site area to assess the soil condition at surface and at certain depths. Water samples were collected from existing tube wells to analyze status of water quality of upper/ deeper aquifers. Conclusion was prepared incorporating the extent of soil &amp; groundwater contamination.</p>		



Name of project	: Third Party Inspection for Gujarat Maritime Board (GMB) for construction of Landfill cells and bilge water treatment plant at Alang Ship yard done by M/s. Gujarat Enviro Protection Infrastructure Limited (GEPIL), Surat.
Year	: 2011
Project features	: <ul style="list-style-type: none"> <li>• Scrutiny &amp; vetting the design &amp; supervision over construction of landfill cells</li> <li>• Scrutiny &amp; vetting the Design and testing &amp; supervision over Supply and installation of incinerator</li> <li>• Scrutiny &amp; vetting Design and testing &amp; supervision over Construction of Bilge water treatment</li> <li>• Scrutiny &amp; vetting Design and testing &amp; supervision over Installation and Construction over firefighting system</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>Gujarat Maritime Board (GMB) is operating TSDF at Alang Shipyard. GMB intended the upgradation of the TSDF sites which includes construction of Landfill site having one lakh cubic meter capacity, Incinerator having 5 MT per day capacity along with Fire Frighthening system and construction of Leachate and Bilge Water Treatment plant with 10 KLD capacities and awarded the work to to M/s. Gujarat Enviro Protection Infrastructure Limited (GEPIL), Surat. GMB has awarded the work for Third Party Inspection (TPI) for the said upgradation to GITCO Ltd. GITCO provided overall project management consultancy in form of third-party inspection agency for design, construction, supply and installation of all the four units. GITCO started the work by Reviewing and vetting of Project report consisting of Design, Sections, Drawings of Landfill Cells, Incinerator along with firefighting system and Bilge &amp; Leachate Water Treatment submitted by GEPIL to GMB. Vetting &amp; certification was done for different phases of construction as per approved design. All the units were approved &amp; completion certificate was issued for all above four units after carrying out necessary testing and procedures as per prevailing norms. GITCO had submitted detailed compliance report to GMB for the work done by GEPIL.</p>	



<b>Name of project</b>	:	Geo-hydrological study in & around the premises for Ground water flow investigation for M/s. Sagar Drugs Pvt. Ltd., Ahmedabad, Gujarat
<b>Year</b>	:	2006
<b>Project features</b>	:	<ul style="list-style-type: none"> <li>• Introduction of study</li> <li>• Climate &amp; Rainfall of area</li> <li>• Physiography</li> <li>• Geology</li> <li>• Subsurface geology &amp; Aquifer system</li> <li>• Details of existing tube wells</li> <li>• Movement of Ground water</li> <li>• Ground water flow &amp; its direction</li> <li>• Conclusion</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>M/s. Sagar Drugs &amp; Pharmaceuticals Pvt. Ltd. Is involved in the manufacturing of Vinyl Sulphone a Dye Intermediate. The basic objective of this study was to know the ground water flow direction around the factory area. GITCO has carried out detailed Geo-hydrological study in &amp; around the plant premises to access Ground water flow direction. A desk base study was carried out to know the data regarding Climate &amp; Rainfall, Physiography, Geology, Aquifer System &amp; Existing tube wells was collected. To decide the groundwater flow direction; static water level data around Singarva village were collected from Gujarat Water Resource Development Corporation Ltd. (GWRDC) and plotted on the map. From the reduced levels of tube wells, depth of static water levels were subtracted to obtain reduced levels of SWL.</p>		



<b>Name of project</b>	:	<b>Geo-hydrological study In &amp; around the premises for M/s. Gujarat Fluorochemicals Limited, Ranjitnagar, Halol, Gujarat</b>
<b>Year</b>	:	2000
<b>Project features</b>	:	<ul style="list-style-type: none"> <li>• Introduction of study</li> <li>• Climate &amp; Rainfall of area</li> <li>• Physiography</li> <li>• Geology</li> <li>• Subsurface geology &amp; Aquifer system</li> <li>• Details of existing tube wells</li> <li>• Movement of Ground water</li> <li>• Ground water flow &amp; its direction</li> <li>• Conclusion</li> </ul>
<b>Description of actual services provided within the assignment:</b>		
<p>M/s. GFL is involved in the manufacturing of refrigerant gas. GITCO has carried out detailed Geo-hydrological study In &amp; around the premises of M/s. Gujarat Fluorochemicals Ltd. to assess the ground water flow direction around factory area and levels of fluoride in groundwater.</p>		



<b>Name of project</b>	:	Contamination study Related to the Dumping of Hazardous Waste at Vatva, Ahmedabad for M/s. Green Env. Co. Ser. Soc. Ltd.
<b>Year</b>	:	2000
<b>Project features</b>	:	<ul style="list-style-type: none"> <li>• Secondary data collection (i.e. Source &amp; Characteristics of sludge)</li> <li>• Site visit &amp; sludge sample collection</li> <li>• Analysis of Sludge</li> <li>• Soil quality analysis after removal of sludge from site</li> <li>• Review &amp; Interpretation of results</li> <li>• Observation &amp; Conclusion</li> </ul>
<b>Description of actual services provided within the assignment:</b>		
<p>Illegal dumping of hazardous waste was found near Express way that connects Ahmedabad to Baroda. GITCO was assigned the work of monitoring and site clearance. Prior to sample collection, the area was visually inspected to assessed. Soil samples from contaminated site were collected and assessed.</p>		



Name of project	: Contaminated site Assessment & Remedial Measure to Eradicate &/Or Control Contamination for M/s. Swastik Organic, Himmatnagar, Gujarat
Year	: 2011
Project features	: <ul style="list-style-type: none"> <li>• Site Assessment</li> <li>• Excavation of pit for soil sampling</li> <li>• Geo hydrological survey &amp; Investigation</li> <li>• Well Inventory</li> <li>• Water sample collection form existing Tube wells</li> <li>• Indication of extent of soil &amp; ground water pollution</li> </ul>
<p><b>Description of actual services provided within the assignment:</b></p> <p>The unit was engaged in the manufacturing of different Dyes Intermediates from 1982-2004. During this period the unit had duped Iron Sludge on open land near the factory premises. Over these many years the same has contaminated the below surface land and ground water. Contamination of Groundwater, land and surface water due to dumping of the is Iron Sludge was carried out. During this study GITCO has done Soil and Geo Hydrological survey &amp; investigation studies in and around the contaminated plant site of Swastik Organics. The base line data was collected, compiled, analyzed and interpreted to assess the present status of soil and ground water conditions and identifying probable reasons for distribution of pollutant in underground soil and water environment, if any. As per the investigation studies and findings remedial measures were suggested.</p>	



**ANNEXURE 2.1**  
**Letter from MoEF for Gypsum as Non-Hazardous Substance**



P. No.23-161/2014-HSMD  
Government of India  
Ministry of Environment & Forests  
HSM Division

2<sup>nd</sup> Floor, Jal Block  
Indira paryavaran Bhawan  
Jor Bagh Road, Aliganj  
New Delhi - 110 003  
Date: 17<sup>th</sup> October 2014

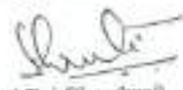
**Subject: - Permission for backfilling of mines by M/s Ashapura volclay Ltd.,  
Bhuj-Kutch -reg.**

This is with reference to letter dated 16/06/2014 regarding the subject cited above from M/s Ashapura Volclay Ltd. (copy enclosed)

2. The matter was considered in this Ministry during the 32<sup>nd</sup> Meeting of Technical Review Committee held on 24<sup>th</sup> September 2014. The committee was informed that the gypsum is produced by the neutralization of sulphuric acid containing leach liquor obtained from the leaching of bentonite clay, by lime. The analysis reports by SOS and Pollution laboratories, Surat submitted by the applicant does not indicate the presence of any hazardous constituents above the limits.

3. Accordingly, as per recommendation of the committee, the Ministry is of the view that the gypsum from this source can be categorized as non-hazardous.

This issue with the approval of competent authority,

  
[Dr. Shruti Rai Sharda]  
Joint Director/Scientist D  
Telefax- 24695333

To  
✓ M/S Ashapura Volclay Limited  
Village Ler, Near Bhujodi,  
Off Anjar-Bhuj Highway,  
Bhuj-Kutch-370020

CC to:

The Member Secretary,  
Gujarat Pollution Control Board (GPCB),  
Paryavaran Bhawan Sector-10A,  
Gandhinagar-382010, Gujarat



**ANNEXURE 4.1**  
**HEAVY METAL ANALYSIS REPORTS OF GYPSUM FROM DETOX**  
**INDIA PVT. LTD.**





**ETOX GROUP**

**Gypsum Sample Analysis Report**

<b>[1] Client Name &amp; Address:</b>	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2020/25-1
"GITCO House" opp. Sandar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

<b>[2] Sampling Details :</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : SL01-35/S1/26022020
Sampling Procedures : Not Specified	Description of Sample : Gypsum sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 01.03.2020	S1/22 - 1ft Depth Sewage Line at Kukma - Lakhond Road, Lat:23°13' 28.55"N, Long:69°46' 43.28"E

<b>[3] Results :</b>					
Sr. No.	Test Parameters	Unit	Results	Method Detection Limit	Method of Measurement
			L1		
1	SiO <sub>2</sub>	%	0.22	0.047*	EPA 3050B (Dec 1996 Rev 2)
2	Al <sub>2</sub> O <sub>3</sub>	%	1.07	0.050*	EPA 3050B (Dec 1996 Rev 2)
3	Fe <sub>2</sub> O <sub>3</sub>	%	15.73	0.069*	EPA 3050B (Dec 1996 Rev 2)
<b>Waste Constituent Test - TCLP</b>					
4	Lead	mg/l	ND	0.1	USEPA: 1313
5	Cadmium	mg/l	ND	0.1	USEPA: 1313
6	Mercury	mg/l	ND	0.1	USEPA: 1313
7	Chromium	mg/l	<0.1	0.1	USEPA: 1313
8	Arsenic	mg/l	ND	0.1	USEPA: 1313
9	Selenium	mg/l	ND	0.1	USEPA: 1313
<b>Waste Constituent Test - STLC</b>					
10	Nickel	mg/l	1.746	0.1	Title 22, CCR, Sec-66261 Appendix II
11	Antimony	mg/l	<0.1	0.1	Title 22, CCR, Sec-66261 Appendix II
<b>Waste Constit. Dist. Water Extrc.</b>					
12	Ammonia	mg/l	<1.0	1.0	APHA 23rd Ed. 4500 NH3, B&C
13	Cyanide	mg/l	ND	0.03	APHA 23rd Ed. 4500 CN, E

Note: \* MDL in mg/kg. The result is converted to %.

ND : Not Detected

Place : Surat

Date : 19.03.2020

Notes: (1) The results pertain to tested items only.

(2) This report shall not be reproduced except in full and authenticity of this report must be validated with office copy at Detox Corporation Pvt. Ltd.

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DCPL/Lab/199.5/163

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CIN :- U41000GJ200PTC048470

For DETOX CORPORATION PVT. LTD.

Autho: Signatory



Rev./Date  
00/11.12.2019

**DETOX GROUP****Gypsum Sample Analysis Report**

<b>[1] Client Name &amp; Address:</b>	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2020/25-2
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

<b>[2] Sampling Details :</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S101-35/S2/26022020
Sampling Procedures : Not Specified	Description of Sample : Gypsum sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling :-
Test Completion Date : 01.03.2020	S2/23 - Gypsum sample at Natural drain between farm of Dinesh mahraj and Govind vankar Kukma village , Lat:23°13' 28.55"N, Long:69°46' 43.28"E

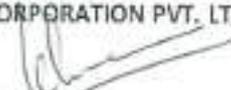
<b>[3] Results :</b>					
Sr. No.	Test Parameters	Unit	Results	Method Detection Limit	Method of Measurement
			L1		
1	SiO <sub>2</sub>	%	0.19	0.047*	EPA 3050B (Dec 1996 Rev 2)
2	Al <sub>2</sub> O <sub>3</sub>	%	0.89	0.050*	EPA 3050B (Dec 1996 Rev 2)
3	Fe <sub>2</sub> O <sub>3</sub>	%	14.17	0.069*	EPA 3050B (Dec 1996 Rev 2)
<b>Waste Constituent Test - TCLP</b>					
4	Lead	mg/l	ND	0.1	USEPA: 1313
5	Cadmium	mg/l	ND	0.1	USEPA: 1313
6	Mercury	mg/l	ND	0.1	USEPA: 1313
7	Chromium	mg/l	ND	0.1	USEPA: 1313
8	Arsenic	mg/l	ND	0.1	USEPA: 1313
9	Selenium	mg/l	ND	0.1	USEPA: 1313
<b>Waste Constituent Test – STLC</b>					
10	Nickel	mg/l	1.399	0.1	Title 22, CCR, Sec-56261 Appendix II
11	Antimony	mg/l	<0.1	0.1	Title 22, CCR, Sec-56261 Appendix II
<b>Waste Constit. Dist. Water Extrc.</b>					
12	Ammonia	mg/l	<1.0	1.0	APHA 23rd Ed. 4500 NH3, B&C
13	Cyanide	mg/l	ND	0.03	APHA 23rd Ed. 4500 CN, E

\* MDL in mg/kg. The result is converted to %.

ND: Not Detected

Place : Surat

For DETOX CORPORATION PVT. LTD.

  
 Autho. Signatory

Date : 19.03.2020

Notes : (1) The results pertain to tested items only.

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Rev./Date

03/11.12.2019





**DETOX GROUP**

**Gypsum Sample Analysis Report**

<b>[1] Client Name &amp; Address:</b>	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2020/25-3
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

<b>[2] Sampling Details :</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : SL01-35/S3 /26022020
Sampling Procedures : Not Specified	Description of Sample : Gypsum sample of APL
Date of Sampling : 17.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 01.03.2020	53/24 - Gypsum sample near vankalmata temple, Bhujodi village Lat:23°13'35.44"N 69°44'41.32"E

<b>[3] Results :</b>					
Sr. No.	Test Parameters	Unit	Results	Method Detection Limit	Method of Measurement
			L1		
1	SiO <sub>2</sub>	%	0.09	0.047*	EPA 3050B (Dec 1996 Rev 2)
2	Al <sub>2</sub> O <sub>3</sub>	%	0.82	0.050*	EPA 3050B (Dec 1996 Rev 2)
3	Fe <sub>2</sub> O <sub>3</sub>	%	12.18	0.069*	EPA 3050B (Dec 1996 Rev 2)
<b>Waste Constituent Test - TCLP</b>					
4	Lead	mg/l	ND	0.1	USEPA: 1313
5	Cadmium	mg/l	ND	0.1	USEPA: 1313
6	Mercury	mg/l	ND	0.1	USEPA: 1313
7	Chromium	mg/l	<0.1	0.1	USEPA: 1313
8	Arsenic	mg/l	ND	0.1	USEPA: 1313
9	Selenium	mg/l	ND	0.1	USEPA: 1313
<b>Waste Constituent Test – STLC</b>					
10	Nickel	mg/l	1.573	0.1	Title 22, CCR, Sec-66261 Appendix II
11	Antimony	mg/l	<0.1	0.1	Title 22, CCR, Sec-66261 Appendix II
<b>Waste Constit. Dist. Water Extrc.</b>					
12	Ammonia	mg/l	<1.0	1.0	APHA 23rd Ed. 4500 NH3, B&C
13	Cyanide	mg/l	ND	0.03	APHA 23rd Ed. 4500 CN, E

\* MDL in mg/kg. The result is converted to %.

ND : Not Detected

Place : Surat

Date : 19.03.2020

Notes : (1) The results pertain to tested items only.

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CIN :- U41000GJ200PTC048470

For DETOX CORPORATION PVT. LTD.

Auto. Signatory





**DETOX GROUP**

**Gypsum Sample Analysis Report**

**[1] Client Name & Address:**

Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2020/25-4
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

**[2] Sampling Details :**

Protocol Purpose : Solid Sample Analysis	Sample Lab ID : S101-35/54/26022020
Sampling Procedures : Not Specified	Description of Sample : Gypsum sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 01.03.2020	54/25 - Gypsum sample at Near Vrundavan Gir Gaudham Bhuj-Bhachau road Lat:23°14'04.33"N 69°46'35.57"E

**[3] Results :**

Sr. No.	Test Parameters	Unit	Results	Method Detection Limit	Method of Measurement
			L1		
1	SiO <sub>2</sub>	%	0.26	0.047*	EPA 3050B (Dec 1996 Rev 2)
2	Al <sub>2</sub> O <sub>3</sub>	%	0.77	0.050*	EPA 3050B (Dec 1996 Rev 2)
3	Fe <sub>2</sub> O <sub>3</sub>	%	13.93	0.069*	EPA 3050B (Dec 1996 Rev 2)
<b>Waste Constituent Test - TCLP</b>					
4	Lead	mg/l	ND	0.1	USEPA: 1313
5	Cadmium	mg/l	ND	0.1	USEPA: 1313
6	Mercury	mg/l	ND	0.1	USEPA: 1313
7	Chromium	mg/l	ND	0.1	USEPA: 1313
8	Arsenic	mg/l	ND	0.1	USEPA: 1313
9	Selenium	mg/l	ND	0.1	USEPA: 1313
<b>Waste Constituent Test – STLC</b>					
10	Nickel	mg/l	1.098	0.1	Title 22, CCR, Sec-66261 Appendix II
11	Antimony	mg/l	<0.1	0.1	Title 22, CCR, Sec-66261 Appendix II
<b>Waste Constit. Dist. Water Extrc.</b>					
12	Ammonia	mg/l	<1.0	1.0	APHA 23rd Ed. 4500 NH3, B&C
13	Cyanide	mg/l	ND	0.03	APHA 23rd Ed. 4500 CN, E

\* MDL in mg/kg. The result is converted to %.

ND : Not Detected

Place : Surat

Date : 19.03.2020

Notes : (1) The results pertain to tested items only.

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For DETOX CORPORATION PVT. LTD.

Autho. Signatory

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CIN :- U41000GJ200PTC048470

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**DETOX GROUP**

**Gypsum Sample Analysis Report**

**[1] Client Name & Address:**

Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2020/25-5
"GITCO House" opp. Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

**[2] Sampling Details:**

Protocol Purpose : Solid Sample Analysis	Sample Lab ID : SL01-35/55/26022020
Sampling Procedures : Not Specified	Description of Sample : Gypsum sample of APL
Date of Sampling : 19.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G / 1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss. Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 01.03.2020	SS/26 - Gypsum sample at Near pithora Dada Temple, Ler village Lat: 23°10'23.18"N 69°09'46"05.05"E

**[3] Results :**

Sr. No.	Test Parameters	Unit	Results	Method Detection Limit	Method of Measurement
			L1		
1	SiO <sub>2</sub>	%	0.16	0.047*	EPA 3050B (Dec 1996 Rev 2)
2	Al <sub>2</sub> O <sub>3</sub>	%	1.17	0.050*	EPA 3050B (Dec 1996 Rev 2)
3	Fe <sub>2</sub> O <sub>3</sub>	%	21.28	0.069*	EPA 3050B (Dec 1996 Rev 2)
<b>Waste Constituent Test - TCLP</b>					
4	Lead	mg/l	ND	0.1	USEPA: 1313
5	Cadmium	mg/l	ND	0.1	USEPA: 1313
6	Mercury	mg/l	ND	0.1	USEPA: 1313
7	Chromium	mg/l	0.17	0.1	USEPA: 1313
8	Arsenic	mg/l	ND	0.1	USEPA: 1313
9	Selenium	mg/l	ND	0.1	USEPA: 1313
<b>Waste Constituent Test - STLC</b>					
10	Nickel	mg/l	1.663	0.1	Title 22, CCR, Sec-66261 Appendix II
11	Antimony	mg/l	<0.1	0.1	Title 22, CCR, Sec-66261 Appendix II
<b>Waste Constit. Dist. Water Extrc.</b>					
12	Ammonia	mg/l	<1.0	1.0	APHA 23rd Ed. 4500 NH3, B&C
13	Cyanide	mg/l	ND	0.03	APHA 23rd Ed. 4500 CN, E

\* MDL in mg/kg. The result is converted to %.

ND: Not Detected

Place : Surat

Date : 19.03.2020

Notes : (1) The results pertain to tested items only.

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CIN :- U41000GJ200PTC048470

For DETOX CORPORATION PVT. LTD.

Autho. Signatory





Gypsum Sample Analysis Report

[1] Client Name & Address:

Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2020/25-6
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad - 380009	Report Page (s): 1 of 1

[2] Sampling Details :

Protocol Purpose : Solid Sample Analysis	Sample Lab ID : 5L01-35/56 /26022020
Sampling Procedures : Not Specified	Description of Sample : Gypsum sample of APL
Date of Sampling : 17.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling :--
Test Completion Date : 01.03.2020	56/27 -Gypsum sample at Land of Lakhod Village Lat:23°15'12.11"N 69°46'41.11"E

[3] Results :

Sr. No.	Test Parameters	Unit	Results	Method Detection Limit	Method of Measurement
			L1		
1	SiO <sub>2</sub>	%	0.18	0.047*	EPA 3050B (Dec 1996 Rev 2)
2	Al <sub>2</sub> O <sub>3</sub>	%	1.02	0.050*	EPA 3050B (Dec 1996 Rev 2)
3	Fe <sub>2</sub> O <sub>3</sub>	%	16.46	0.069*	EPA 3050B (Dec 1996 Rev 2)
Waste Constituent Test - TCLP					
4	Lead	mg/l	ND	0.1	USEPA: 1313
5	Cadmium	mg/l	ND	0.1	USEPA: 1313
6	Mercury	mg/l	ND	0.1	USEPA: 1313
7	Chromium	mg/l	<0.1	0.1	USEPA: 1313
8	Arsenic	mg/l	ND	0.1	USEPA: 1313
9	Selenium	mg/l	ND	0.1	USEPA: 1313
Waste Constituent Test – STLC					
10	Nickel	mg/l	1.644	0.1	Title 22, CCR, Sec-66261 Appendix II
11	Antimony	mg/l	<0.1	0.1	Title 22, CCR, Sec-66261 Appendix II
Waste Constit. Dist. Water Extrc.					
12	Ammonia	mg/l	1.50	1.0	APHA 23rd Ed. 4500 NH3, B&C
13	Cyanide	mg/l	ND	0.03	APHA 23rd Ed. 4500 CN, E

\* MDL in mg/kg. The result is converted to %.

ND: Not Detected

Place : Surat

Date : 19.03.2020

Notes : (1) The results pertain to tested items only.  
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CIN :- U41000GJ200PTC048470

For DETOX CORPORATION PVT. LTD.

Autho. Signatory





**DETOX GROUP**

**Gypsum Sample Analysis Report**

**[1] Client Name & Address:**

Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2020/25-7
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

**[2] Sampling Details:**

Protocol Purpose : Solid Sample Analysis	Sample Lab ID : SL01-35/57 /26022020
Sampling Procedures : Not Specified	Description of Sample : Gypsum sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling :--
Test Completion Date : 01.03.2020	57/28 -Gypsum sample at Land of Lakhond Village Lat:23°15'11.04"N 69°46'44.89"E

**[3] Results :**

Sr. No.	Test Parameters	Unit	Results	Method Detection Limit	Method of Measurement
			L1		
1	SiO <sub>2</sub>	%	0.436	0.047*	EPA 3050B (Dec 1996 Rev 2)
2	Al <sub>2</sub> O <sub>3</sub>	%	1.043	0.050*	EPA 3050B (Dec 1996 Rev 2)
3	Fe <sub>2</sub> O <sub>3</sub>	%	18.185	0.069*	EPA 3050B (Dec 1996 Rev 2)
<b>Waste Constituent Test - TCLP</b>					
4	Lead	mg/l	ND	0.1	USEPA: 1313
5	Cadmium	mg/l	ND	0.1	USEPA: 1313
6	Mercury	mg/l	ND	0.1	USEPA: 1313
7	Chromium	mg/l	0.666	0.1	USEPA: 1313
8	Arsenic	mg/l	ND	0.1	USEPA: 1313
9	Selenium	mg/l	ND	0.1	USEPA: 1313
<b>Waste Constituent Test – STLC</b>					
10	Nickel	mg/l	0.965	0.1	Title 22, CCR, Sec-66261 Appendix II
11	Antimony	mg/l	<0.1	0.1	Title 22, CCR, Sec-66261 Appendix II
<b>Waste Constit. Dist. Water Extrc.</b>					
12	Ammonia	mg/l	1.86	1.0	APHA 23rd Ed. 4500 NH3, B&C
13	Cyanide	mg/l	ND	0.03	APHA 23rd Ed. 4500 CN, E

\* MDL in mg/kg. The result is converted to %.

ND : Not Detected

Place : **Surat**

Date : **19.03.2020**

Notes : (1) The results pertain to tested items only.

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CIN :- U41000GJ200PTC048470

For DETOX CORPORATION PVT. LTD.

Autho. Signatory



**Gypsum Sample Analysis Report**

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2020/25-8
"GITCO House" opp. Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : SL01-35/58/26022020
Sampling Procedures : Not Specified	Description of Sample : Gypsum sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 01.03.2020	S8/29 -Gypsum sample at 2 ft Depth Government land,padhdhar village Lat:23°14'25.30"N69°48'44.13"E

[3] Results :					
Sr. No.	Test Parameters	Unit	Results	Method Detection Limit	Method of Measurement
			L1		
1	SiO <sub>2</sub>	%	0.279	0.047*	EPA 3050B (Dec 1996 Rev 2)
2	Al <sub>2</sub> O <sub>3</sub>	%	1.059	0.050*	EPA 3050B (Dec 1996 Rev 2)
3	Fe <sub>2</sub> O <sub>3</sub>	%	16.858	0.069*	EPA 3050B (Dec 1996 Rev 2)
Waste Constituent Test- TCLP					
4	Lead	mg/l	ND	0.1	USEPA: 1313
5	Cadmium	mg/l	ND	0.1	USEPA: 1313
6	Mercury	mg/l	ND	0.1	USEPA: 1313
7	Chromium	mg/l	<0.1	0.1	USEPA: 1313
8	Arsenic	mg/l	ND	0.1	USEPA: 1313
9	Selenium	mg/l	ND	0.1	USEPA: 1313
Waste Constituent Test – STLC					
10	Nickel	mg/l	1.653	0.1	Title 22, CCR, Sec-66261 Appendix II
11	Antimony	mg/l	<0.1	0.1	Title 22, CCR, Sec-66261 Appendix II
Waste Constit. Dist. Water Extrc.					
12	Ammonia	mg/l	<1.0	1.0	APHA 23rd Ed. 4500 NH <sub>3</sub> , B&C
13	Cyanide	mg/l	ND	0.03	APHA 23rd Ed. 4500 CN, E

\* MDL in mg/kg. The result is converted to %.

ND: Not Detected

Place : Surat

Date : 19.03.2020

Notes: (1) The results pertain to tested items only.

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Autho. Signatory



**DETOX GROUP****Gypsum Sample Analysis Report**

[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2020/25-9
"GITCO House" opp. Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : SL01-35/S9/26022020
Sampling Procedures : Not Specified	Description of Sample : Gypsum sample of APL
Date of Sampling : 17.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 01.03.2020	S9/30 -Gypsum sample at Mamubhajivabhai, B/h.Mangal Mandir School. bhujodi village , Lat:23°13'45.11"N 69°44'08.96"E

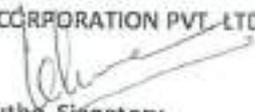
[3] Results :					
Sr. No.	Test Parameters	Unit	Results	Method Detection Limit	Method of Measurement
			L1		
1	SiO <sub>2</sub>	%	0.142	0.047*	EPA 3050B (Dec 1996 Rev 2)
2	Al <sub>2</sub> O <sub>3</sub>	%	0.914	0.050*	EPA 3050B (Dec 1996 Rev 2)
3	Fe <sub>2</sub> O <sub>3</sub>	%	12.613	0.069*	EPA 3050B (Dec 1996 Rev 2)
<b>Waste Constituent Test - TCLP</b>					
4	Lead	mg/l	ND	0.1	USEPA: 1313
5	Cadmium	mg/l	ND	0.1	USEPA: 1313
6	Mercury	mg/l	ND	0.1	USEPA: 1313
7	Chromium	mg/l	0.117	0.1	USEPA: 1313
8	Arsenic	mg/l	ND	0.1	USEPA: 1313
9	Selenium	mg/l	ND	0.1	USEPA: 1313
<b>Waste Constituent Test – STLC</b>					
10	Nickel	mg/l	0.545	0.1	Title 22, CCR, Sec-66261 Appendix II
11	Antimony	mg/l	<0.1	0.1	Title 22, CCR, Sec-66261 Appendix II
<b>Waste Constit. Dist. Water Extrc.</b>					
12	Ammonia	mg/l	<1.0	1.0	APHA 23rd Ed. 4500 NH3, B&C
13	Cyanide	mg/l	ND	0.03	APHA 23rd Ed. 4500CN, E

\* MDL in mg/kg. The result is converted to %.

ND : Not Detected

Place : Surat

For DETOX CORPORATION PVT. LTD.

  
 Autho. Signatory

Date : 19.03.2020

Notes : (1) The results pertain to tested items only.

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DETOX GROUP

**Gypsum Sample Analysis Report**

<b>[1] Client Name &amp; Address:</b>	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2020/25-10
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

<b>[2] Sampling Details:</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : SL01-35/510/26022020
Sampling Procedures : Not Specified	Description of Sample : Gypsum sample of APL
Date of Sampling : 17.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G/1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 01.03.2020	S10/31 -Gypsum sample at near Old Stone Mine, kukma Village , Lat:23°13'21.14"N 69°46'21.09"E

<b>[3] Results:</b>					
Sr. No.	Test Parameters	Unit	Results	Method Detection Limit	Method of Measurement
			L1		
1	SiO <sub>2</sub>	%	0.196	0.047*	EPA 3050B (Dec 1996 Rev 2)
2	Al <sub>2</sub> O <sub>3</sub>	%	1.069	0.050*	EPA 3050B (Dec 1996 Rev 2)
3	Fe <sub>2</sub> O <sub>3</sub>	%	15.044	0.069*	EPA 3050B (Dec 1996 Rev 2)
<b>Waste Constituent Test - TCLP</b>					
4	Lead	mg/l	ND	0.1	USEPA: 1313
5	Cadmium	mg/l	ND	0.1	USEPA: 1313
6	Mercury	mg/l	ND	0.1	USEPA: 1313
7	Chromium	mg/l	<0.1	0.1	USEPA: 1313
8	Arsenic	mg/l	ND	0.1	USEPA: 1313
9	Selenium	mg/l	ND	0.1	USEPA: 1313
<b>Waste Constituent Test - STLC</b>					
10	Nickel	mg/l	1.283	0.1	Title 22, CCR, Sec-66261 Appendix II
11	Antimony	mg/l	<0.1	0.1	Title 22, CCR, Sec-66261 Appendix II
<b>Waste Constit. Dist. Water Extrc.</b>					
12	Ammonia	mg/l	<1.0	1.0	APHA 23rd Ed. 4500 NH3, B&C
13	Cyanide	mg/l	ND	0.03	APHA 23rd Ed. 4500CN, E

\* MDL in mg/kg. The result is converted to %.

ND: Not Detected

Place : Surat

Date : 19.03.2020

Notes: (1) The results pertain to tested items only.

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CIN :- U41000GJ200PTC048470

For DETOX CORPORATION PVT. LTD.

Autho. Signatory



**ETOX GROUP****Gypsum Sample Analysis Report**

<b>[1] Client Name &amp; Address:</b>	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2020/25-11
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

<b>[2] Sampling Details:</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : SL01-35/S11/20022020
Sampling Procedures : Not Specified	Description of Sample : Gypsum sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on: 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 01.03.2020	S11/32 -Gypsum sample near mines Beside old hot mix plant , kukma village Lat:23°13'14.95"N 69°46'06.28"E

<b>[3] Results :</b>					
Sr. No.	Test Parameters	Unit	Results	Method Detection Limit	Method of Measurement
			L1		
1	SiO <sub>2</sub>	%	0.193	0.047*	EPA 3050B (Dec 1996 Rev 2)
2	Al <sub>2</sub> O <sub>3</sub>	%	1.102	0.050*	EPA 3050B (Dec 1996 Rev 2)
3	Fe <sub>2</sub> O <sub>3</sub>	%	17.023	0.069*	EPA 3050B (Dec 1996 Rev 2)
<b>Waste Constituent Test - TCLP</b>					
4	Lead	mg/l	ND	0.1	USEPA: 1313
5	Cadmium	mg/l	ND	0.1	USEPA: 1313
6	Mercury	mg/l	ND	0.1	USEPA: 1313
7	Chromium	mg/l	<0.1	0.1	USEPA: 1313
8	Arsenic	mg/l	ND	0.1	USEPA: 1313
9	Selenium	mg/l	ND	0.1	USEPA: 1313
<b>Waste Constituent Test - STLC</b>					
10	Nickel	mg/l	1.761	0.1	Title 22, CCR, Sec-66261 Appendix II
11	Antimony	mg/l	<0.1	0.1	Title 22, CCR, Sec-66261 Appendix II
<b>Waste Constit. Dist. Water Extrc.</b>					
12	Ammonia	mg/l	<1.0	1.0	APHA 23rd Ed. 4500 NH3, 8&C
13	Cyanide	mg/l	ND	0.03	APHA 23rd Ed. 4500 CN, E

\* MDL in mg/kg. The result is converted to %.

ND : Not Detected

Place : Surat

Date : 19.03.2020

Notes : (1) The results pertain to tested items only.

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For DETOX CORPORATION PVT. LTD.

  
 Autho-Signatory




Gypsum Sample Analysis Report

<b>[1] Client Name &amp; Address:</b>	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2020/25-12
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

<b>[2] Sampling Details :</b>	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : SL01-35/512/26022020
Sampling Procedures : Not Specified	Description of Sample : Gypsum sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zafak khambhata
Test Start Date : 27.02.2020	Location Of Sampling :--
Test Completion Date : 01.03.2020	S12/33 -Gypsum sample near Mines , B/h.Khatri Mill Kukma village Lat:23°13'13.20"N 69°45'58.87"E

<b>[3] Results :</b>					
Sr. No.	Test Parameters	Unit	Results	Method Detection Limit	Method of Measurement
			L1		
1	SiO <sub>2</sub>	%	0.140	0.047*	EPA 3050B (Dec 1996 Rev 2)
2	Al <sub>2</sub> O <sub>3</sub>	%	0.996	0.050*	EPA 3050B (Dec 1996 Rev 2)
3	Fe <sub>2</sub> O <sub>3</sub>	%	16.000	0.069*	EPA 3050B (Dec 1996 Rev 2)
<b>Waste Constituent Test - TCLP</b>					
4	Lead	mg/l	ND	0.1	USEPA: 1313
5	Cadmium	mg/l	ND	0.1	USEPA: 1313
6	Mercury	mg/l	ND	0.1	USEPA: 1313
7	Chromium	mg/l	ND	0.1	USEPA: 1313
8	Arsenic	mg/l	ND	0.1	USEPA: 1313
9	Selenium	mg/l	ND	0.1	USEPA: 1313
<b>Waste Constituent Test – STLC</b>					
10	Nickel	mg/l	1.520	0.1	Title 22, CCR, Sec-66261 Appendix II
11	Antimony	mg/l	<0.1	0.1	Title 22, CCR, Sec-66261 Appendix II
<b>Waste Constit. Dist. Water Extrc.</b>					
12	Ammonia	mg/l	<1.0	1.0	APHA 23rd Ed. 4500 NH3, B&C
13	Cyanide	mg/l	ND	0.03	APHA 23rd Ed. 4500 CN, E

\* MDL in mg/kg. The result is converted to %.

ND : Not Detected

Place : Surat

Date : 19.03.2020

Notes: (1) The results pertain to tested items only.

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CIN :- U41000GJ200PTC048470

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Autho. Signatory



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[1] Client Name & Address:	
Gujarat Industrial & Technical Consultancy Organization Limited.	Test Report No : DCPL/ENV/2020/25-13
"GITCO House" opp.Sardar Patel Stadium Road	Issue Date : 19.03.2020
Navrangpura, Ahmedabad- 380009	Report Page (s): 1 of 1

[2] Sampling Details :	
Protocol Purpose : Solid Sample Analysis	Sample Lab ID : SI01-35/513/26022020
Sampling Procedures : Not Specified	Description of Sample : Gypsum sample of APL
Date of Sampling : 18.02.2020	Packing : Plastic Ziplock
Sampling Done By : GITCO Ltd.	Sample Quantity/ No. of Samples : 500 G /1 No.
Sampling Time : Not Specified	Client Order : GITCO/Soil Dated on : 27-02-2020
Sample Received Date : 27.02.2020	Client Representative : Miss.Zalak khambhata
Test Start Date : 27.02.2020	Location Of Sampling : --
Test Completion Date : 01.03.2020	S13/34 -Gypsum sample at China clay mines, Lakhond Village Lat:23°15'39.24"N 69°47'17.05"E

[3] Results :					
Sr. No.	Test Parameters	Unit	Results	Method Detection Limit	Method of Measurement
			L1		
1	SiO <sub>2</sub>	%	0.160	0.047*	EPA 3050B (Dec 1996 Rev 2)
2	Al <sub>2</sub> O <sub>3</sub>	%	1.130	0.050*	EPA 3050B (Dec 1996 Rev 2)
3	Fe <sub>2</sub> O <sub>3</sub>	%	18.484	0.069*	EPA 3050B (Dec 1996 Rev 2)
<b>Waste Constituent Test - TCLP</b>					
4	Lead	mg/l	ND	0.1	USEPA: 1313
5	Cadmium	mg/l	ND	0.1	USEPA: 1313
6	Mercury	mg/l	ND	0.1	USEPA: 1313
7	Chromium	mg/l	ND	0.1	USEPA: 1313
8	Arsenic	mg/l	ND	0.1	USEPA: 1313
9	Selenium	mg/l	ND	0.1	USEPA: 1313
<b>Waste Constituent Test – STLC</b>					
10	Nickel	mg/l	1.850	0.1	Title 22, CCR, Sec-66261 Appendix II
11	Antimony	mg/l	<0.1	0.1	Title 22, CCR, Sec-66261 Appendix II
<b>Waste Constit. Dist. Water Extrc.</b>					
12	Ammonia	mg/l	1.50	1.0	APHA 23rd Ed. 4500 NH3, 8&C
13	Cyanide	mg/l	ND	0.03	APHA 23rd Ed. 4500 CN, E

\* MDL in mg/kg. The result is converted to %.

ND : Not Detected

Place : Surat

Date : 19.03.2020

Notes : (1) The results pertain to tested items only.

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For DETOX CORPORATION PVT. LTD.

Autho. Signatory

Rev./Date  
08/11.12.2019



## ANNEXURE 5.1

### National Program for Rehabilitation of Polluted Sites in India

#### Guidance document for assessment and remediation of contaminated sites in India

#### Volume II – Standards and checklists

1<sup>st</sup> Edition, March 2015



**Ministry of Environment and Forests**  
GOVERNMENT OF INDIA



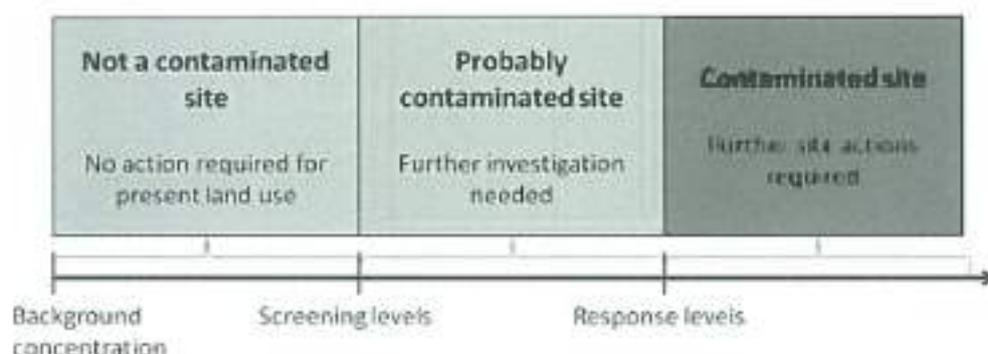
## Volume II-2.1-b Screening and Response levels

### 1 Introduction

This information is relevant for various Steps and Tasks in the assessment and remediation process.  
Screening and Response levels are important to assess the level of contamination.

Screening levels are generic concentrations of hazardous substances in soil and sediments, groundwater and surface water at or below which potential risks to human health or the environment are not likely to occur and where no further investigation and assessment is needed. These Screening levels are distinguished for land use.

Response levels are generic concentrations of hazardous substances in soil and sediments at or above which it is very likely there is threat to human health or the environment, that may be imminent. At or above this level some form of response is required to provide an adequate level of safety to protect public health and/or the environment.



Note that that for certain contaminants such as Persistent Organic Pollutants, no background concentrations should be used, as there is no natural background for these substances.

### 2 Screening and Response levels

The table on next pages provides the Screening and Response levels.



Chemical Name	Chemical Groups	Soil (Screening and Response Levels)				Groundwater for drinking water (Screening levels) *				Surface water Quality (Screening levels)					
		Levels in soil (HW Rules, 2008) <sup>1)</sup>	Response levels (Dutch filter version levels) <sup>2)</sup>	Screening levels (Soil Quality Guidelines for the Protection of Environmental and Human Health) <sup>3)</sup>			Indian standard for Drinking Water* (Maximum acceptable concentration) <sup>4)</sup>	Guidelines for Canadian Drinking Water Quality <sup>5)</sup>	WHO guidelines for Drinking water <sup>6)</sup>	The Environment (Protection) Rules, 1986 (Schedule II) General standards for discharge of environmental pollutants				Canadian Water Quality Guidelines for the Protection of Aquatic Life <sup>7)</sup>	Canadian Water Quality Guidelines for Agriculture <sup>8)</sup>
				Agricultural	Recreational parkland	Commercial				Industrial	Public sewers	Land for irrigation	Millicose coastal areas		
1,1,1-Trichloroethane (TCE)	Halogenated aliphatic compounds	5000	15	0.1	5	50	50	50	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane (PCE)	Halogenated aliphatic compounds	5000	8.8	0.1	0.2	0.5	0.6	0.6	0.03	0.04	-	-	110	-	-
1,1,2,2-Tetrachloroethane	Halogenated aliphatic compounds	5000	-	0.1	5	50	50	50	-	-	-	-	-	-	-
1,1,2-Trichloroethane	Halogenated aliphatic compounds	5000	10	0.1	5	50	50	50	-	-	-	-	-	-	-
1,1,2-Trichloroethane (TCE)	Halogenated aliphatic compounds	5000	2.5	0.01	0.05	0.01	0.01	0.01	0.005	0.02	-	-	21	-	750
1,1-Dichloroethane	Halogenated aliphatic compounds	5000	15	0.1	5	50	50	50	-	-	-	-	-	-	-
1,1-Dichloroethane	Halogenated aliphatic compounds	5000	0.3	0.1	5	50	50	50	0.018	-	-	-	-	-	-
1,2,3,4-Tetrachlorobenzene	Halogenated aromatic compounds	50	2.2	0.05	2	10	30	30	-	-	-	-	-	-	-
1,2,3,4-Tetrachlorobenzene	Halogenated aromatic compounds	50	2.2	0.05	2	10	30	30	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	Halogenated aromatic compounds	50	11	0.05	2	10	30	30	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	Halogenated aromatic compounds	50	2.2	0.05	2	10	30	30	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	Halogenated aromatic compounds	50	11	0.05	2	10	30	30	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	Halogenated aromatic compounds	50	19	0.1	5	50	50	50	-	-	-	-	-	-	-
1,2-Dichlorobenzene	Halogenated aromatic compounds	5000	6.4	0.1	5	50	50	50	0.008	0.005	0.003	-	300	-	75
1,2-Dichloroethene	Halogenated aliphatic compounds	5000	1	0.1	5	50	50	50	-	-	0.05	-	-	-	-
1,2-Dichloropropane	Halogenated aliphatic compounds	5000	3	0.1	5	50	50	50	-	-	0.04	-	-	-	-
1,2-Dichloropropane (cis and trans)	Halogenated aliphatic compounds	5000	-	0.1	5	50	50	50	-	-	1	-	-	-	-
1,3,5-Trichlorobenzene	Halogenated aromatic compounds	50	50	0.05	2	10	30	30	-	-	-	-	-	-	-
1,3-Dichlorobenzene	Halogenated aromatic compounds	50	50	0.1	1	10	10	10	-	-	-	-	-	-	-
1,4-Dichlorobenzene	Halogenated aromatic compounds	50	50	0.1	1	10	10	10	-	-	0.005	0.3	150	-	-
1,4-Dioxane	Halogenated aromatic compounds	-	-	-	-	-	-	-	-	-	0.05	-	26	-	-
2,3,4,6-Tetrachlorophenol	Halogenated aromatic compounds	50	50	0.05	0.5	5	5	5	0.1	-	-	-	-	-	-
2,4,6-Trichlorophenol	Halogenated aromatic compounds	50	50	0.05	0.5	5	5	5	0.005	0.2	-	-	-	-	-
2,4-Dichlorophenol	Halogenated aromatic compounds	50	50	0.05	0.5	5	5	5	0.3	-	-	-	-	-	-
2,4-Dichlorophenoxyacetic acid (2,4-D)	Pesticides (Phenoxy herbicide)	-	-	-	-	-	-	-	0.03	0.03	-	-	-	-	-
Tris(1,1-propenyl) methyl carbamate	Pesticides, Carbamate	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polychlorinated biphenyls	Polycyclic aromatic hydrocarbons (PAH)	-	-	0.1 μ	1 μ	10 μ	10 μ	10 μ	-	-	-	-	1.9	-	-
Acenaphthylene	Polycyclic aromatic hydrocarbons (PAH)	-	-	0.1 μ	1 μ	10 μ	10 μ	10 μ	-	-	-	-	5.8	-	-
Acridene	Polycyclic aromatic hydrocarbons (PAH)	-	-	0.1 μ	1 μ	10 μ	10 μ	10 μ	-	-	-	-	4.4	-	-
9,10-Carb	Pesticides, Carbamate	-	-	-	-	-	-	-	0.009	0.01	-	-	1	-	54.9/71
9,10-Flu	Pesticides, Organochlorine	50	0.31	-	-	-	-	-	0.00003	0.0007	0.00003	-	0.004	-	-
Aliphatics nonchlorinated (each)	Non-halogenated aliphatic compounds	-	-	0.3	-	-	-	-	0.03	-	-	-	Variable	-	-
Aluminium	Metal	20000	-	-	-	-	-	-	0.5	-	-	-	Table	-	-
Arsenic (total)	Inorganic	-	-	-	-	-	-	-	-	-	-	-	10	-	-
Arsenic (inorganic)	Inorganic	-	-	-	-	-	-	-	-	-	-	-	2.2	-	-
Arsenic	Organic	-	-	-	-	-	-	-	-	-	-	-	0.003	-	-
Attracene	Polycyclic aromatic hydrocarbons (PAH)	50	50	0.1 μ	1 μ	10 μ	10 μ	10 μ	-	-	-	-	5	-	-
Antimony (metal)	Inorganic	50	22	20	20	40	40	40	0.056	0.02	-	-	0.2	-	-
Arsenic	Metal	50	50 (70)	12	12	32	32	32	0.01	0.01	0.01	0.2	0.2	5	-



Chemical Name	Chemical Groups	Soil (Screening and Response Levels)				Groundwater for drinking water (Screening levels)				Surface water Quality (Screening levels)				
		Levels in soil (HW Rules, 2008) <sup>a</sup> mg/kg	Response levels (Dutch Inter-verification levels) <sup>b</sup> mg/kg	Soil Quality Guidelines for the Protection of Environmental and Human Health <sup>a</sup>		Indian Standard for Drinking Water* (Maximum acceptable concentration)	Guidelines for Groundwater Quality for drinking water	WHO guidelines for drinking water	The Environment Protection Rules, 1986 (Schedule VI) General standards for discharge of environmental pollutants			Canadian Water Quality Guidelines for the Protection of Aquatic Life	Canadian Water Quality Guidelines for Agriculture	
				Agricultural mg/kg	Residential/ parkland mg/kg				Commercial mg/kg	Industrial mg/kg	Public sewers mg/l			Land for irrigation mg/l
Asbestos		3000	100	-	-	-	-	-	-	-	-	-	-	-
Azinphos	Pesticides, Thiocarb	-	0.71	-	-	-	-	-	0.002	0.005	-	-	1.8	10/5
Barijuri	Inorganic	30000	-	750	500	2000	2000	0.7	1.0	0.7	-	-	-	-
Bismuth	Aromatic aromatic compounds	50	1.1	0.05	0.2	5	5	-	0.005	0.005	0.01*	0.01*	370	-
Benz[a]anthracene	Polycyclic aromatic hydrocarbons (PAH)	50	-	0.1	1	10	10	-	0.0001	0.0001	-	-	0.018	-
Benz[a]pyrene	Polycyclic aromatic hydrocarbons (PAH)	50	-	0.1	1	10	10	-	-	-	-	-	0.015	-
Benzofluoranthene	Polycyclic aromatic hydrocarbons (PAH)	-	-	0.1	1	10	10	-	-	-	-	-	-	-
Benzofluoranthene	Polycyclic aromatic hydrocarbons (PAH)	50	-	0.1	1	10	10	-	-	-	-	-	-	-
Benzylflou	Inorganic	50	-	4	4	8	8	-	-	-	-	-	-	100/100
Boron	Inorganic	-	-	2	-	-	-	0.5	5.0	-	-	-	1.5mg/L	5000/5000
Bromaz	Pesticides	-	-	-	-	-	-	-	-	-	-	-	5	0.2/100
Bromop	Pesticides, Benzimidazole	-	-	-	-	-	-	-	0.005	0.005	-	-	5	0.33/11
Cadmium	Metal	50	1.5	1.4	10	22	22	0.003	0.005	0.005	2	1	Equation	5,1/80
Calcium	Inorganic	-	-	-	-	-	-	75	-	-	-	-	-	-1000/1000
Captaf	Pesticides	-	-	-	-	-	-	-	-	-	-	-	1.3	-/13
Carbaryl	Pesticides, Carbamate	-	0.45	-	-	-	-	-	-	-	-	-	0.2	-/100
Carbofuran	Pesticides, Carbamate	-	0.017	-	-	-	-	-	0.09	0.09	0.01	0.01	1.8	-/45
Chloridate	Pesticides, Organochlorine	50	8	-	-	-	-	-	-	-	-	-	0.001	-/7
Chlorobutyl	Inorganic	-	-	-	-	-	-	250	-	-	-	-	or 120 mg/L	Variable/
Chlorobutyl	Pesticides	-	-	-	-	-	-	-	-	-	-	-	0.18	craps/170
Chlorpyrifos	Pesticides, Organophosphorus	5000	-	-	-	-	-	0.05	0.09	0.03	-	-	0.003	-/24
Chromium (total)	Metal	-	-	64	64	87	87	-	0.05	0.05	2	2	-	-
Chromium, hexavalent (Cr(VI))	Metal	50	50 (70)	0.4	0.4	1.4	1.4	0.05	-	-	0.1	2	1	8/50
Chromium, trivalent (Cr(III))	Metal	5000	180	-	-	-	-	-	-	-	-	-	8.9	4,9/50
Chrysene	Polycyclic aromatic hydrocarbons (PAH)	50	-	0.1	1	10	10	-	-	-	-	-	-	-
Cobalt	Inorganic	5000	190	40	50	200	300	-	-	-	-	-	-	50/1050
Coliforms, fecal (Escherichia coli)	Biological	-	-	-	-	-	-	-	-	-	-	-	-	mL
Coliforms, total	Biological	-	-	-	-	-	-	-	-	-	-	-	-	mL
Copper	Physical	-	-	-	-	-	-	5 Hagen Units	-	-	-	-	Narrative	-
Conductivity	Physical	-	-	2.65/m	2.65/m	4.45/m	4.45/m	-	-	-	-	-	-	Variable/constant
Copper	Metal	5000	190	63	63	91	91	0.05	-	-	2	3	Equation	0.5/10
Cyanazine	Pesticides, Triazine	-	-	-	-	-	-	-	0.01	0.0006	-	-	2	-
Cyanide	Inorganic	50	50	0.9	0.9	8	8	0.05	0.2	0.07	0.2	2	5 (as free CN)	-
Cyanobacteria	Biological	-	-	-	-	-	-	-	0.0015	0.0015	-	-	-	-
Debris	Physical	-	-	-	-	-	-	-	-	-	-	-	-	-
Dechlorobis	Pesticides	-	-	-	-	-	-	-	-	-	-	-	0.0004	-/2.5
Dib[2,3-b]fluorodiphenyl ether	Polychlorinated biphenyls	-	-	-	-	-	-	-	-	-	-	-	16	-
Dib[2,3-b]fluorodiphenyl ether	Polychlorinated biphenyls	-	-	-	-	-	-	-	-	-	-	-	19	-





Chemical Name	Chemical Groups	Soil (Screening and Response levels)				Groundwater for drinking water (Screening levels) *				Surface water Quality (Screening levels)				
		Levels in soil (HW Rules, 2002) <sup>1</sup>	Response levels (Dutch Intervention levels) <sup>2</sup>	Screening levels			Indian Standard for Drinking Water * (Maximum acceptable concentration)	Guidelines for Drinking Water Quality	WHO guidelines for Drinking water	The Enforcement (Protection) Rules, 1986 Schedule VI (Other standards for discharge of environmental pollutants)			Canadian Water Quality Guidelines for the Protection of Aquatic Life	Canadian Water Quality Guidelines for the Protection of Agriculture
				Agricultural mg/kg	Residential/ parkland mg/kg	Commercial mg/kg				Industrial mg/kg	Effluent surface water mg/l	Public sewers mg/l		
Monochlorobenzene (ortho HCB)	Pesticides, Organochlorine	-	1.7	-	-	-	-	-	-	-	-	-	-	-
Di-nitrochlorobenzene (Meta HCB)	Pesticides, Organochlorine	-	3.5	-	-	-	-	-	-	-	-	-	-	-
Di-nitrochlorobenzene (Para HCB)	Pesticides, Organochlorine	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrocarbons		5000												
Indole		-	-	-	-	-	-	-	-	-	-	-	-	-
Indole (2,3-cyloprene)	Polycyclic aromatic hydrocarbons (PAH)	50	-	0.18	10.0	10.0	-	-	-	-	-	-	0.23	-
Iron	Inorganic	-	-	-	-	-	-	0.3	-	-	-	-	-	-
Lead	Metal	1000	510	70	140	200	0.01	0.01	-	1	-	2	Equation	200/100
Lead (gamma HCl)	Pesticides, Organochlorine	50	1.2	-	-	-	0.002	-	-	-	-	-	7	0.07/-
Lithium	Inorganic	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithium	Inorganic	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	Pesticides, Organophosphorus	5000	-	-	-	-	-	0.19	0.19	-	30	10	-	-
Magnesium	Inorganic	-	-	-	-	-	-	0.1	-	2	2	2	-	200/-
Mercury (inorganic)	Metal	50	36	6.6	6.6	24	0.001	0.001	0.001	0.01	0.01	0.01	0.026	-
Methyrene		-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tertiary-butyl ether (MTBE)	Aliphatic ether	-	-	-	-	-	-	-	-	-	-	-	-	-
MCPA (Methylchlorophenoxyacetic acid)	Pesticides	-	4	-	-	-	-	-	0.1	-	-	-	-	0.025/2.5
(4-Chloro-2-methyl phenoxy acetic acid, 2-Methyl-4-chloro phenoxy acetic acid)		-	-	-	-	-	-	-	-	-	-	-	-	-
Methylmercury	Organic	5000	-	-	-	-	-	-	-	-	-	-	0.004	-
Methylmercurion	Pesticide, Organophosphorus	5000	-	-	-	-	-	0.0003	-	-	10	10	-	-
Methoxychlor	Pesticides, Organophosphorus	50	-	-	-	-	-	-	0.05	-	-	-	7.8	25/50
Methoxychlor	Pesticides, Triazine	-	-	-	-	-	-	-	0.05	-	-	-	1	0.5/80
Methoxychlor	Pesticides, Triazine	-	-	-	-	-	-	-	0.05	-	-	-	73	Narrative/500
Methoxychlor	Inorganic	5000	180	5	10	40	0.07	0.07	-	0.07	-	-	-	-
Methoxychlor	Organic	5000	-	-	-	-	-	-	-	-	-	-	-	-
Monobromomethane	Halogenated aliphatic compounds	5000	-	-	-	-	-	-	-	-	-	-	-	-
Monochlorobenzene	Halogenated aromatic compounds	50	15	0.1	1	30	10	-	0.08	-	-	-	1.3	-
Monochloromethane	Halogenated aliphatic compounds	5000	-	-	-	-	-	-	-	-	-	-	-	-
Monochlorophenols	Chlorinated phenols	50	5.4	0.05	0.5	5	5	-	-	-	-	-	7	-
Naphthalene	Polycyclic aromatic hydrocarbons (PAH)	50	50	0.10	1.0	10.0	10.0	-	-	-	-	-	1.1	-
Nickel	Metal	5000	100	50	50	50	0.02	0.02	-	0.07	3	3	Equation	100/1000
Nitrate	Inorganic nitrogen compounds	20000	-	-	-	-	-	45	45	50	10	10	13 mg/L	-
Nitrate + Nitrite	Inorganic nitrogen compounds	20000	-	-	-	-	-	-	-	3	-	-	-	NCS-NO2-N
Nitrite	Inorganic nitrogen compounds	5000	-	-	-	-	-	-	-	-	-	-	-	40 NO2-N /100 000 NO2-N
Nonylphenol and its ethoxylates	Nonylphenol and its ethoxylates	-	-	5.7	5.7	34	14	-	-	-	-	-	1	Framework
Nonylphenol		-	-	-	-	-	-	-	-	-	-	-	-	-
n-Pentane	Aliphatic hydrocarbon	-	-	0.49/6.5	0.49/6.5	6.5/21.0	6.5/21.0	-	-	-	-	-	-	-
Parathion	Pesticide, Organophosphorus	5000	-	-	-	-	-	-	-	-	-	-	-	-
Perchloroethylene	Halogenated aromatic compounds	50	6.7	0.05	0.5	5	5	-	-	-	-	-	8	-
Perchloroethanol	Halogenated aromatic compounds	50	12	7.6	7.6	7.6	7.6	-	0.06	0.09	-	-	0.5	-



Chemical Name	Chemical Groups	Soil (Screening and Response levels)				Groundwater for drinking water (Screening levels)				Surface water Quality (Screening levels)					
		Levels in soil (HW Rules, 2003) 1	Response levels (Dutch Intervention levels) 2	Screening levels: Soil Quality Guidelines for the Protection of Environmental and Human Health 3			Indian Standard for Drinking Water* Minimum acceptable concentration) mg/l	Guidelines for Drinking Water Quality 4	WHO guidelines for drinking water 5	The Environment (Protection) Rules, 1986 Schedule of General standards for discharge of environmental pollutants			Canadian Water Quality Guidelines for the Protection of Aquatic Life 6	Canadian Water Quality Guidelines for the Protection of Agriculture 7	
				Agricultural mg/kg	Residential/ parkland mg/kg	Commercial mg/kg				Industrial mg/kg	Inland surface water mg/l	Public sewers mg/l			Land for irrigation mg/l
Permethrin	Pesticides, Organochlorine compounds	50	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	Polycyclic aromatic hydrocarbons (PAH) compounds	50	0.1 u	1 u	10 u	20 u	-	-	-	-	-	-	-	-	-
Phenolic compounds (as CD-150H)		5000	14	1	10	10	0.001	-	-	1	5	5	-	-	-
Phenols (mono- & ethylic)	Aromatic hydroxy compounds	5000	-	3.8	3.8	3.8	-	-	-	-	-	-	-	4	-72
Phenoxo herbicides	Pesticides	-	-	-	-	-	-	-	-	-	-	-	-	4	-100
Phosphorus (as P)	Inorganic phosphate esters	20000	-	-	-	-	-	-	-	5	-	-	-	Framework	-
Phthalic acid ester (each)	Plasticizers	-	-	30	-	-	-	-	-	-	-	-	-	-	-
Picloram	Pesticides	-	-	-	-	-	-	-	-	-	-	-	-	29	-130
PCBs (Polychlorinated Biphenyls)	Polychlorinated biphenyls	50	1	1.3	33	33	0.0025	-	-	-	-	-	-	0.001	-
Polycyclic hydrocarbon (PAH)	Polycyclic aromatic hydrocarbons (PAH)	-	40	-	-	-	0.0021	-	-	-	-	-	-	-	-
Polychlorinated dibenzo-p-dioxins/dibenzofurans	Polychlorinated dioxins and furans	-	0.00018	1	1	1	-	-	-	-	-	-	-	-	-
Propylene glycol	Glycols	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	Polycyclic aromatic hydrocarbons (PAH)	-	-	0.1 u	1 u	10 u	-	-	-	-	-	-	-	500.000	-
pH	Inorganic Acidity, alkalinity and pH	-	-	6 to 8	6 to 8	6 to 8	6.5-8.5	-	-	-	-	-	-	0.025	-
Quinine	Polycyclic aromatic hydrocarbons (PAH)	-	-	0.1 u	1 u	10 u	-	-	-	-	-	-	-	6.5 to 9.0	-
Reactive Chlorine Species	Inorganic Reactive chlorine compounds	-	-	-	-	-	-	-	-	-	-	-	-	3.4	-
Salinity	Physical	-	-	-	-	-	-	-	-	-	-	-	-	0.5	-
Selenium	Inorganic	50	-	1	2.9	2.9	0.01	0.01	0.01	0.01	0.05	0.05	0.05	3	Variable/50
Silver	Inorganic	5000	-	20	40	40	0.1	0.1	0.01	0.01	0.01	0.01	0.01	0.1	-
Sinigrin	Pesticides, Triazine	-	-	3	12	12	-	-	-	0.01	0.01	0.01	0.01	10	0.5
Sodium adsorption ratio		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Streambed substrate	solids Total particulate matter	-	-	-	-	-	-	-	-	-	-	-	-	Narrative	-
Styrene	Monocyclic aromatic compounds	20000	66	0.1	5	50	50	-	-	-	-	-	-	72	-
Sulfabase	Organic sulphur compound	-	-	0.8	0.8	0.8	-	-	-	-	-	-	-	56.000	500
Sulphate	Inorganic sulphur compounds	-	-	-	-	-	200	-	-	-	-	-	-	-	No data
Sulphur (elemental)	Inorganic sulphur compounds	50000	-	-	-	-	-	-	-	-	-	-	-	-	-
Swampy sediments	solids Total particulate matter	-	-	500	-	-	-	-	-	-	-	-	-	-	-
Tebuuthiazin	Pesticides	-	-	-	-	-	-	-	-	-	-	-	-	Narrative	-
Tellurium		50	-	-	-	-	-	-	-	-	-	-	-	1.6	same boys, and
Temperature	Physical Temperature	-	-	-	-	-	-	-	-	-	-	-	-	Narrative	-
Tetrachloroethane	Halogenated aliphatic compounds	5000	0.7	0.1	5	50	50	-	-	-	-	-	-	13.3	-
Tetrahaloethane	Halogenated aromatic compounds	50	31	0.05	0.5	5	5	-	0.1	-	-	-	-	1	-
Thiourea	Inorganic	50	-	1	1	1	-	-	-	-	-	-	-	0.8	-
Thiourea	Non-halogenated organic compound	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-
Tin (inorganic)	Inorganic	5000	-	3	50	300	300	-	-	-	-	-	-	-	-
Tin (organic)		50	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	Monocyclic aromatic compounds	20000	32	0.1	3	30	30	-	-	-	-	-	-	3	-
Total dissolved solids (TDS)	Minerals	-	-	-	-	-	-	-	-	100	600	700	100	-	-
Total hydrocarbons (THC) (mineral oil)		50000	5000	-	-	-	0.5	-	-	30	20	10	20	-	00



Chemical Name	Chemical Group	Soil (Screening and Response Levels)				Groundwater for drinking water (Screening levels) <sup>4</sup>			Surface water Quality (Screening levels)					
		Levels in soil (HW Rules, 2008) <sup>5</sup>	Response levels (Dutch Inter-Action levels) <sup>6</sup>		Screening levels Soil Quality Guidelines for the Protection of Environmental and Human Health <sup>7</sup>	Indian Standard for Drinking Water - Maximum acceptable concentration)	Guidelines for Canadian Drinking Water Quality	WHO guidelines for drinking water	The Environment (Protection) rules, 2008 Schedule VI general standards for discharge of environmental pollutants			Canadian Water Quality Guidelines for the Protection of Aquatic Life		
			Agricultural mg/kg	Residential/ parkland mg/kg					Consumer mg/kg	Industrial mg/kg	mg/L		mg/L	mg/L
Toxaphene	Pesticides, Organochlorine	50	-	-	-	-	-	-	-	-	-	-	-	-
Toxalate	Pesticides, Carbamate	-	-	-	-	-	-	-	-	-	-	-	-	-
Tribromomethane	Halogenated aliphatic compounds	5000	-	-	-	-	-	-	-	-	-	-	-	-
Tributyltin	Organotin compounds	50	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene (chloroform)	Halogenated aliphatic compounds	5000	0.7	5	50	50	-	0.3	-	-	-	-	-	-
Trichloroethane	Halogenated aromatic compounds	50	22	0.05	5	5	0.005	-	-	-	-	-	-	-
Tricyclohexylin	Organotin compounds	-	-	-	-	-	-	-	-	-	-	-	-	-
Triphenyltin	Pesticides, Dithioazoline	50	-	-	-	-	-	0.02	-	-	-	-	-	-
Turbidity	Organotin compounds	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten compounds	solids Total particulate matter	-	-	-	-	-	-	1 NTU	0.1-1.0 NTU	-	-	-	-	-
Uranium	Inorganic	-	-	-	-	-	-	-	-	-	-	-	-	-
Urylchloride	Halogenated aliphatic compounds	5000	0.1	-	-	-	-	-	0.015	-	-	-	-	-
Zinc	Inorganic	5000	27	0.1	5	50	50	-	0.002	0.0503	-	-	-	-
Zinc	Monocyclic aromatic compounds	20000	17	0.1	5	50	50	-	-	-	-	-	-	-
Zinc	Miscel	20000	720	200	200	360	360	-	-	-	-	-	-	-

NR: No relocation

R: CCME (Canadian Council of Ministers of the Environment), 1991. Interim Canadian environmental quality criteria for contaminated sites. CCME, Winnipeg

#: coarse/fine sediment.

5: as (µg); xx is value from HWB 2008; yy is Dutch intervention value. In this case levels from HWB are used because these are lower.

6: IS; 10102-2012

7: referring to schedule II of the Hazardous Waste rules, 2008. These levels are not relevant for the assessment of contaminated sites, but may apply if during remediation material is excavated, transported and disposed of or treated.

Note: the total content of the various substances in categories 50, 5000, 20000 and 50000 are indicated, should not exceed specified levels to be determined as hazardous waste.

8: referring to Dutch intervention values which represent a level above which unacceptable risks may occur. The risk model by which these levels were determined takes into account a residential situation where people live and partly eat crops from the site. In this way these levels provide a relatively low level of risk. i.e. a conservative approach. The levels in this list are fixed number, no dependency on soil characteristics has to be applied.

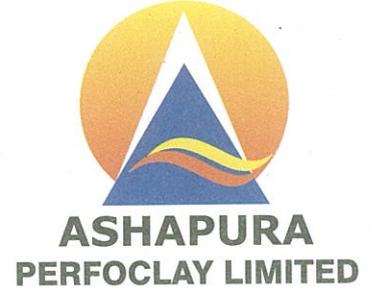
9: referring to CCME Canadian Environmental Quality Guidelines, these levels represent a level of negligible risk and provide a level that is regarded to enable a healthy functioning system for different types of land use.

10: Groundwater for drinking water. Screening levels: If Indian Standard for Drinking Water is not available for that parameter first referring to Guidelines for Canadian Drinking Water Quality and secondly to WHO Guidelines for drinking water.



Date: 12/06/2020

To,  
Member Secretary  
Gujarat Pollution Control Board  
Paryavaran Bhavan,  
Sector 10-A  
Gandhinagar-382010



**Kind Attention: Smt U.K. Upadhyay (SEE)-Unit Head-Kutch.**

**Subject:** Reply for the Visit done on 12<sup>th</sup> May, 2020.

G.P.O. NO. (17)
Inward No:- 801
Date:- 15/6/20
Sign:- [Signature]

Dear Sir & Ma'am,

This is in reference to the aforementioned visit dated 12.05.2020. At the outset, we would like to apologize for the delayed response, but the same is due to the lockdown affected in the State of Gujarat as well as worldwide, due to Covid-19, owing to which, we faced a great deal of difficulty in coordinating for the collation and assimilation of the necessary documents in order to reply in a detailed manner. The delay is also the result of the undersigned industry being highly occupied with manufacturing of an essential raw material, namely bleaching clay used for production of an essential commodity i.e. edible oil, which was the need of the hour, during the pandemic situation, being faced by the country. Therefore, the undersigned unit apologizes for the delay and hereby submits the detailed reply showing compliance of the NGT order dated 20.11.2020, including the progress made by undersigned unit before and after the submission of the third and final progress report, dated [20/02/2020].

The department has raised certain queries which are being addressed by the undersigned unit as mentioned hereinbelow;

**1. Unit shall comply with all the orders mentioned in O.A. No. 669/2018 given by Honorable NGT, Revocation order dated 20/02/2020 and NOD dated 18/11/2019.**

The undersigned unit as per the NOD dated 18.11.2019, has already submitted three detailed progress report, dated [18/12/2019], [24/01/2020], [20/02/2020] till the month of February 2020. Thus, the unit has with utmost sincerity and feasibility complied with the directions issued by Hon'ble National Green Tribunal [NGT] in the matter of O.A. 669/2018 both in letter and spirit, in pursuance of which, the undersigned unit has cleared Gypsum from 21 sites out of a total of 34 gypsum sites. It is pertinent to mention that certain sites from wherein, the undersigned unit found it hard to remove Gypsum earlier, also has now been removed, with the necessary help from the department.

It is important to mention that the department has issued revocation of closure order dated 20.02.2020, wherein, it was suggested by the department, as per condition no.9, that a third-party certification for the remediation process undertaken till date by the undersigned Industry shall be undertaken. Therefore, for obtaining the certification with regard to the removal of Gypsum from the 34 sites and impact of Gypsum on the Groundwater,

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CIN No. U14108MH1997PLC107300



the undersigned Industry has availed the services of Gujarat Industrial and Technical Consultancy Organization Ltd (**GITCO**), to prepare a detailed report of the remediation process and guide the undersigned industry therewith. The GITCO report is bifurcated into two parts;

- a. Part I deals with the certification of the 21 sites from where Gypsum has been removed and;
  - b. Part II deals with the remaining 13 sites.
- A brief GITCO report along with details of the 21 sites as well as the remaining 13 sites is annexed herewith as **ANNEXURE – I**.
- Further, in compliance with the order of the NGT, and as per NOD dated 18.11.2019, groundwater remediation is going on as per the recommended technique of *Kadam environmental consultants*. Please refer **ANNEXURE – II** which shows decreasing trend of level of ammonical nitrogen.

The undersigned unit is also strictly complying with the conditions mentioned in revocation of closure order. [A compliance report of Revocation order dated 20/02/2020 is marked and annexed herewith as **Annexure – III**]

**2. The Unit shall strictly comply with the conditions given in EC/CTE/CCA.**

The undersigned unit understands the importance of following the conditions laid down under the EC/CTE/CCA and has always endeavored to follow the same. [A brief chart of the compliance of the EC conditions is marked and attached as **Annexure IV**]

**3. As per your submission dated 07/03/2020, you had asked for the local authority for delayed removal/lifting of gypsum activity. In this regard, clarify the work done by you with supporting documents within 3 days.**

It is no doubt correct that the undersigned unit had sought the support of the department with respect to the lifting of Gypsum from few sites where, the unit needed the support of the local authorities for lifting of Gypsum. However, it is the department who has guided us well and supported us to remove the Gypsum from even those sites where it was difficult to remove the same.

Thereupon, as the unit faced extreme difficulty in removing Gypsum from certain sites, i.e. 13 remaining sites, the department vide revocation order dated 20.02.2020 suggested to get a third party certification with regard to the entire remediation done.

Hence, the undersigned unit hired the services of GITCO, further as per the GITCO report, there is an alternative remediation remedy available, so if the department agrees, the unit would be willing to adopt those suggestions, thus, also limiting and making the support of the local authorities for removal of Gypsum dispensable.

A brief description along with the reasons that are acting as blockades for removal of Gypsum from the remaining 13 sites has been enlisted below;



<u>Site No.</u>	<u>LOCATION</u>	<u>SITE DETAIL</u>	<u>REASON FOR NON- REMOVAL.</u>
S1/22	Beside Kukma-Lakhond Village Road	Gypsum is laid on the sides of a sewage line between Kukma to Lakhond Road.	Gypsum is here used to provide structural support to the sewage pipeline. Removing gypsum may cause instability to surface and structure which can cause damage to sewage pipeline and can further as a consequence lead to domestic wastewater pollution.
S2/23	Natural drain between farm of Dinesh Maharaj and Govind Vankar, Kukma Village.	Crops are growing viz. Castor Beans, where Gypsum is laid, as well as used as a soil conditioner. The Gypsum is laid on the bund wall of the farm.	Gypsum is used here to provide support to embankment of farm slope which can reduce the chances of soil erosion. Majorly Gypsum is used as Soil conditioner in the farm where crops are grown already. Gypsum helps to retain the moisture which is very beneficial to crops along with providing some necessary nutrients. Removal of gypsum from farm and slope may cause damage to the farming land and lead to soil erosion from the slope of the farm.
S3/24	Shri Vankal mata Mandir	Plantation i.e. Neem, Gulmohar etc are growing, where Gypsum is used as a soil conditioner.	Gypsum is used as Soil conditioner near the temple area to grow various varieties of trees e.g. Gulmohar, Neem, conocarpus and to develop the green belt around the temple. Further, Gypsum is also giving structural support to the temple which, if removed, would lead to permanent damage to the Temple. Thus, removal of gypsum from this site may cause damage to plants and may leads to soil erosion.
S4/25	Vrundavan Gir Gaudham, Shree Swaminarayan Mandir, Besides Ashapura Colony, Bhachau Road	Gypsum is used to level, the land of Gowshala of Swaminarayan Mandir and clay layer is laid over Gypsum layer.	Gypsum was used herein for land reclamation. Subsequently, a cowshed had been constructed on the levelled land. Thus, removing Gypsum from underneath the Cowshed would mean disturbing the structure of the Cowshed and destroying it permanently.
S5/26	Pithora dada Mandir, Ler Village	Gypsum is laid on the bund wall and gives support to the bund wall of the temple. The same has been stone-pitched.	Gypsum is used to provide structural support on the hill side of temple as temple is situated on a hill. One entire side of the temple is supported by gypsum alone, thus removal of gypsum from there may cause substantial damage to the property. Gypsum is also used to level nearby area of temple on which See-Saw, Swing and Slide is constructed for recreational activities.



			kids. Removal of gypsum may turn the land uneven and as a consequence lead to structural damage.
S6/27	Land of Lakhond Village	The Gypsum is utilized for Land Reclamation.	Gypsum was used once again to level land and as it added moisture to the soil, fodder crops were grown subsequently to help feed the cattle in and around this area. Gypsum has become an integral part of the existing land and removing it will cause soil erosion and also lead to damage of the fodder crops, grown specifically to feed cattle.
S7/28	Adjacent site of site no. S6/27, Lakhond Village	The Gypsum is utilized for Land Reclamation.	Gypsum was used once again to level land and as it added moisture to the soil, fodder crops were grown subsequently to help feed the cattle in and around this area. Gypsum has become an integral part of the existing land and removing it will cause soil erosion and also lead to damage of the fodder crops, grown specifically to feed cattle.
S8/29	On Government Land, Paddhar Village	The Gypsum is laid on open land.	Gypsum was used again to level land and as it added moisture to the soil, plants and shrubs were grown, such as Babool plants etc. At present many Babool plants and other wild plants are growing which show that land is now suitable for the farming, which however, will be adversely affected after gypsum removal.
S9/30	B/h. Mangal Mandir School, Village Bhujodi	The Gypsum is laid behind Mangal Mandir School of Bhujodi village.	Gypsum is used for leveling of land where a hostel has been constructed on one side while the whole area is being used as school playground and other sports facilities are also being developed over there such as Volley ball court etc.

*For further reference, the detailed report prepared by GITCO may be considered by the Department and henceforth presented before the Hon'ble National Green Tribunal.*

Thanking You

Yours truly,

For, Ashapura Perfoclay Limited



CC: RO, GPCB Bhuj, Kutch West

Gypsum dispatch details

Month	Sanghi Ind (MT)	Ultra Tech (MT)	Mine Backfilling (MT)		Total monthly dispatch (MT)
			Mata namadh	Pundi	
Jan-19	305	1166	--	--	1471
Feb-19	4299	--	--	--	4299
Mar-19	7917	480	--	--	8397
Apr-19	8240	1535	--	--	9775
May-19	7733	1124	--	--	8857
Jun-19	17315	1860	--	--	19175
Jul-19	24021	1788	--	--	25809
Aug-19	2964.33	0	--	--	2964.33
Oct-19	0	2731.43	--	--	2731.43
Nov-19	0	2260.79	2577	--	4837.79
Dec-19	0	0	5508	--	5508
Jan-20	0	0	6778	--	6778
Feb-20	0	0	7582	--	7582
Mar-20	0	0	7590	1000	8590
Apr-20	2993	--	--	--	2993
May-20	569	254	3652	2685	7160
<b>Total</b>	<b>76356.3</b>	<b>13199.2</b>	<b>33687</b>	<b>3685</b>	<b>126928</b>

