Environment and Social Due Diligence Report

February 2017

IND: Clean Energy Finance Investment Program –Hiraco Renewable Energy Private Limited

Prepared by

Indian Renewable Energy Development Agency for the Asian Development Bank

DUE DILIGENCE REPORT

ON

ENVIRONMENTAL & SOCIAL SAFEGUARDS
(LOAN 3186-IND: CLEAN ENERGY FINANCE INVESTMENT PROGRAM-TRANCHE I)

Subproject: 20 MW Solar PV Power Project at Village Bopadar, Taluk Ranavav, District Porbandar, Gujarat State

Subproject Developer: M/s Hiraco Renewable Energy Private Limited

SEPTEMBER 2016

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LIST OF ABBREVIATIONS

ADB	:	Asian Development bank
CTE	:	Consent to Establish
CTO	:	Consent to Operate
COD	:	Commercial Operation Date
ESDD	:	Environmental Safeguard Due Diligence
ESSU	:	Environmental and Social Safeguards Unit
GoI	:	Government of India
GUVNL	:	Gujarat Urja Vikas Nigam Limited
HREPL	:	Hiraco Renewable Energy Private Limited
IREDA	:	Indian Renewable Energy Development Agency Limited
LoC	:	Line of Credit
MoEF	:	Ministry of Environment, Forests and Climate Change
PIM	:	Project Information Memorandum
PPA	:	Power Purchase Agreement
REA	:	Rapid Environmental Assessment
SMF	:	Sealed Maintenance Free
SPS	:	Safeguard Policy Statement
SEIA	:	Social And Environmental Impact Assessment
MW_p	:	Watt Peak Capacity

PART I

ENVIRONMENTAL SAFEGUARDS DUE DILIGENCE REPORT

ENVIRONMENTAL SAFEGUARDS DUE DILIGENCE REPORT

Sub Project: 20 MW Solar PV Power Project at Village Bopadar, Taluk Ranavav, District Porbandar, Gujarat State

A. Sub Project Title

1. The subproject is construction and commissioning of 20 MW capacity solar power project in Village Bopadar, Taluk Ranavav, District Porbandar in the state of Gujarat, India using crystalline technology.

2. The M/s Hiraco Renewable Energy Private Limited (HREPL) is the SPV floated by promoter company Hindustan Clean Energy Limited, which has signed a power purchase agreement (PPA) for 25 years with Gujarat Urja Vikas Nigam (GUVNL), with permission from Government of Gujarat.

3. IREDA, presently has approved a loan to HREPL and intends to fund the subproject through LoC (Line of credit) from ADB.

B. Sub Project Background

4. In accordance with the Gujarat State Solar Energy Policy, 2009, M/s Hiraco Renewable Energy Private Limited (M/s HREPL) received allocation of 20 MW solar photovoltaic project against its application and the tariffs have been fixed as per the policy guidelines. M/s HREPL has been allocated under the second phase of Solar Power Policy – 2009 of the State of Gujarat

C. Sub Project Developer

5. M/s Hiraco Renewable Energy Private Limited is a SPV incorporated on 4th November 2010 by promoter company M/s Hindustan Clean Energy Limited to set up 20MW solar power project in Village Bopadar, Taluk Ranavav, District Porbandar in the state of Gujarat as per the allocation. Apart from this, the promoters have set up and commissioned 12 similar other solar power projects in Gujarat and elsewhere, with capacity ranging between 15-50MW.

6. IREDA is a Public Limited Government Company established in 1987, under the administrative control of MNRE (Ministry of New and Renewable Energy), GoI to promote, develop and extend financial assistance for renewable energy and energy efficiency/ conservation projects. The corporate objectives of IREDA are:

- To give financial support to specific projects and schemes for generating electricity and / or energy through new and renewable sources and conserving energy through energy efficiency
- To increase IREDA's share in the renewable energy sector by way of innovative financing
- To strive to be competitive institution through customer satisfaction.
- To maintain its position as a leading organization to provide efficient and effective financing in renewable energy and energy efficiency / conservation projects.

- Improvement in the efficiency of services provided to customers through continual improvement of systems, processes and resources.

7. In line with its corporate objectives, IREDA is considering to finance the subproject based on crystalline technology being developed by M/s Hiraco Renewable Energy Private Limited. The estimated cost of subproject is INR 238.75 crores, out of which IREDA is processing a loan of INR 128.15 crores for the subproject.

8. At the request of GoI, ADB is processing a loan to IREDA under the Clean Energy Investment Program to augment the efforts of IREDA in financing and promoting the renewal energy projects including the solar power projects.

D. Present Status of Subproject

9. The construction of the subproject was commenced in September 2011 and commercial operations date(COD) was achieved on 18th April 2012. Normally, it takes about 6-8 months for construction and commissioning solar project of this capacity, as has been observed in other similar projects as well. At present, the project is fully operational and functioning to its installed capacity as per allocation.

10. The solar power generated by the subproject is being evacuated through a 66 KV transmission line connected to GETCO Ranakandorna sub-station situated at a distance of 10 km from the subproject site. As the project is planned under the Solar Power Policy (2009) of the state of Gujarat, and as per the terms of Power Purchase Agreement, it is the responsibility of GETCO to arrange, provide and maintain the power evacuation and transmission from the 66 kV switchyard within the subproject.

E. Applicable Environmental Safeguards Policies and Regulatory Framework

I. GoI India Regulatory Framework

11. As per the present regulatory framework, solar power projects do not require any prior environmental clearances either at the Centre or at the State level. The Schedule of EIA notification, 2006 does not include solar power projects and thus are out of the purview of this notification.

12. Further, as per the re-categorization of industries notified by MOEF&CC in March 2016, solar power projects are now placed under white category, which are exempted from even seeking consent to establish(CTE) and consent to operate(CTO) from the State Pollution Control Board. The notification of MOEF&CC as well Gujarat Pollution Control Board is given in **Annexure 1**.

13. Recently, since the project has been commissioned prior to re-categorization of industries notified by MoEF&CC, the subproject will require CTE and CTO from the State Pollution Control Board under the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981.

14. As the land parcels required for subproject has been directly purchased from private land owners and does not involve any forest land, there is no requirement to obtain NOC from Forests and Environment, Department of Gujarat or required to seek any clearances under the

Forest (Conservation) Act, 1980.

15. Other than this, the subproject will not require any regulatory approvals either at state or central levels.

II. ADBs Safeguards Policy and Requirements

16. IREDA's mandate is to minimize the energy sector's negative environmental impact by promoting cleaner and more environmentally friendly technologies, and thus IREDA is committed to avoid and mitigate adverse environmental impacts, if any, resulting from the projects it finances.

17. IREDA has agreed upon an ESMS (Environmental and Social Management System) in order to be fully compliant to ADB's Safeguard Policy Statement (SPS) 2009. As per this, all sub projects financed by IREDA through the LoC from ADB are to be subjected to the agreed upon ESMS to ensure subproject's compliance to ADB's Safeguard Policy Statement (SPS) 2009.

18. IREDA has setup an ESSU (Environmental and Social Safeguards Unit) in accordance with ESMS. The ESSU is presently functional with a designated officer at the level of Asst. General Manager as in-charge of ESSU as well as compliance officer for regulatory compliances. In addition, ESSU has one full-time environmental cum social safeguards officer with 8 years of experience. IREDA has plans to recruit two more similar officers in near future for ESSU. The awareness campaign amongst borrowers of IREDA and as well as capacity building of ESSU I itself is intended to be augmented through a specific ADB TA over next 3 years.

19. IREDA is presently considering to finance the subproject through the LoC from ADB and therefore the subproject is being subjected to the environmental safeguard due diligence in accordance with the ESMS to ensure subproject's compliance to ADB Safeguard Policy Statement (SPS) 2009. In line with its corporate objectives ESSU (Environmental and Social Safeguards Cell) at IREDA conducted an environmental safeguards audit to check and ensure subproject's compliance to the IREDA's ESMS agreed upon with ADB as well as ADB's Safeguards Policy Statement (SPS), 2009. Environmental safeguards audit report is attached part of **Annexure 7**.

III. Scope and Methodology for Environmental Safeguards Due Diligence

20. The ESDD (environmental safeguard due diligence) of the subproject has been carried out as per the laid down procedures in the ESMS agreed upon with ADB and applicable for all IREDA projects financed through ADB's LoC. The scope and methodology adopted for ESDD is briefly described hereunder

21. **Documents Review:** The documents review for conducting ESDD comprised;

- Review of subproject related documents like PIM (Project Information Memorandum), IREDA's loan processing file containing all project related information (from loan application to loan approval stage)
- Review of Detailed Project Report for the subproject prepared by subproject promoter cum developer

- Discussions with the sector specific team within IREDA, involved in the appraisal and loan processing of the subproject
- Discussions with the subproject developers, explaining the need and scope of safeguards due diligence, and seek additional information, wherever required but not available in the PIM or loan processing files at IREDA for preparing ESDD.
- Desk review of secondary environmental baseline data from authentic and published sources

22. The review of documents and meeting with subproject developer as part of the ESDD was carried out at IREDA's office on various dates prior to site visit in September 2016.

E. Site Visit: In co-ordination with IREDA, field visit was undertaken by both environmental and social safeguards specialists to the subproject site between 10-11 September, 2016 for safeguard due diligence of the subproject. The representatives of the promoters/developers accompanied the safeguard specialists to the subproject site and responded to all on site queries.

F. Environmental Safeguards Due Diligence

23. Based on the documents review, site visit and desk review of secondary data from published sources, environmental safeguards due diligence was carried out. The findings of the due diligence as well as the environmental sensitivity of the subproject is given hereunder

- The subproject developer has constructed a 20 MW solar power project in Village Bopadar, Taluk Ranavav, District Porbandar in the state of Gujarat and same has been commissioned on 18th April, 2012. At present the subproject is under operation and power is being evacuated to the grid as in accordance with its power purchase agreement with the Gujarat Urja Vikas Nigam Limited.
- The subproject has been constructed over 118 acres of land, which was/is devoid of any large trees and vegetative cover. The 118 acres of land parcels largely constitute rain dependent single cropped agricultural lands. The lands have been directly purchased from the local people through a willing seller and willing buyer principle along with the consent of local panchayat. The NOC obtained from the panchayat is given in **Annexure 2**. The land parcels purchased for the sub-project was devoid of any human habitations and/or any other encumbrances. Photographs of subproject site are given in **Annexure 3**. The land transfer matters are comprehensively covered in the social due diligence – Part B of the report. The documentary proof of land transfer is provided in **Annexure 11** of social due diligence report.
- As per the information gathered during due diligence site visit, establishing the solar panels for the subproject did not require felling of any trees and/or clearing of any vegetation cover. As such, permissions for tree felling or site clearance activities were not warranted for the subproject.
- The subproject site is connected to the National Highway through all-weather bituminous road. The nearest airport is at Porbandar, which is 35kms away from the subproject location. Since the subproject is more than 20 Km away from the airport and also does not involve construction of any structures, which involves height (limiting height is 150

meters within a distance of 20km from airport), the subproject will not require any height clearances from competent authorities. Copy of Ministry of Civil Aviation (Height Restrictions for Safeguarding of Aircraft Operations) Rules, 2015 is enclosed as **Annexure 4**.

- The subproject, has received the consent to establish (CTE) and Consent to Operate (CTO) from the State Pollution Control Board with a validity of 5 years i.e. October 09, 2016. (Refer **Annexure 5**). The self-certification by M/s HREPL for compliance to avail exemption from routine inspection by GPCB is given in **Annexure 6**. However, as per the re-categorization of industries notified by MOEF&CC in March 2016, solar power projects are now placed under white category, which are exempt from even seeking consent to establish and operate from the State Pollution Control Board.
- As the subproject will not require/warrant an EIA preparation as per regulatory requirement, the developer has not commissioned any EIA studies. However, the developer, as the corporate policy is committed to comply with IFC's Environmental, Health and Safety Guidelines and as required by IREDA for the subproject. A rapid environmental assessment of the subproject using the REA checklist and environmental categorization (attachment 3 & 4 of ESMS) was carried based on the documents review supplemented by site visits for ground truth verification. The filled-in REA checklists and environmental categorization form are given in **Annexure 7**.
- Based on the filled-in REA checklists and environmental categorization, the subproject can be classified as Category B, as the impacts due to construction are largely limited to subproject site itself and such impacts are controlled/mitigated through site specific measures.
- The subproject does not fall under the ADB prohibited list of activities given in **Annexure 8**.
- The subproject has no National Park or Wildlife Sanctuary or ecologically sensitive areas within a radius of 10 km.
- The subproject site is not reported to be falling along the migrant route any threatened/protected wildlife. Occurrence of rare, threatened and/or endangered (both flora and fauna) species has not been reported in and around the subproject area/region.
- No archeological or historical monuments, protected by Archeological Survey of India or from the State Government have been reported in and around the sub project site as well as within a radius of 10 km. The subproject construction did not impact any religious structures or worship places or places of importance/value to the local populace.
- No perennial or seasonal rivers/streams flow within a region of 10 km radius surrounding the sub project site.
- As assessed during field visit for safeguards due diligence, the construction of subproject facility has not involved any significant earth work excavation/filling or major construction activities, except for marginal grading activities to even out and level the ground for installing solar PV panels on prefabricated metallic frames (Ref Site Photographs -Annexure 3).
- The subproject is accessible through an all-weather road almost up to subproject site

and did not require/involve construction of new haul roads for transportation of construction materials. The limited site specific impacts like dust, noise, disposal of construction waste, on site sanitation facilities for construction force, have been reported to be handled through site specific mitigation measures and good engineering practices of the EPC contractor.

- In order to conserve water, developer has opted for manual mopping of panels through wet micro fibers for periodic cleaning of solar PV panels instead of hydrant and sprinkler network, which require comparatively more water. The developer has employed the local villagers for cleaning of panels and 4 cleaning groups have been formed with 4 persons per group. Water is brought to the subproject site in water tankers, which is fitted with motorized fine spraying system. As the water tankers move along panel rows, with spraying of water on either sides, the cleaning group (2 on each side) follow the tankers, cleaning the panels through mops with long handles. Although cleaning of panels is done on a daily basis (except on holidays and rainy days), it takes about 3 weeks to complete one round of cleaning within the entire subproject site.
- The cleaning groups are orally briefed about safety aspects and to avoid high voltage areas within the subproject premises. Except for the high voltage areas, (which are in any case are not near solar panels), the cleaning of panels does not have any safety issues or any requirement for protective devices to work at heights. Photographs which illustrates cleaning of panels through mopping method in a similar operational solar power plant elsewhere is given in **Annexure 9**.
- As the project has regulatory exemptions from both centre and state levels, developer has informed that no environmental monitoring was carried out during construction phase. The HSE in-charge at project site has informed that PFC, the other co-lender to this sub-project has not sought any such requirement for periodic monitoring reports during construction phase.
- The developer has confirmed that they had not received any complaints during construction phase. On the contrary, the developer had provided local people with employment as well as petty/small contracts during construction phase. During due diligence, this aspect was verified through informal interactions with some people, whose parents/family members had sold the land to the subproject and presently some of their family members are even employed as O & M personnel in the subproject.
- On the contrary, the developer has informed that the local people have been benefitted through employment as well as small/petty contracts related to project construction activities during construction phase. Even during the present operation phase, developers have employ the local people for surveillance and security of the subproject, and periodic cleaning and other miscellaneous requirements as deemed fit.
- Factories Act,1948 as well as Explosives Act 1884 (amended 2008), is not applicable to this subproject. However, Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 is applicable to ensure safety and welfare measures for workers employed at building and other construction sites. The subproject is covered under ‘other construction’ category. The Gujarat State Building and Other Construction Workers' Welfare Board monitor compliance to this

act/regulation at all work sites and also a cess is levied on contractor.

- The developer has informed that since its commissioning in Jan 2013, there has been no health, safety issues or incidents at the project site. Periodic orientation to workforce is being provided on EHS issues.
- Interactions during due diligence site visit, developer has informed that all staff are fully oriented and sensitized periodically (monthly staff meetings and informal interactions during onsite inspections) about high voltage areas like invertors, panel rooms and switch/transformer yard areas. All such areas have restricted entry for authorized personnel only, even among O & M staff. Whenever some incident happens, required actions are taken at site and the matter is reported to their corporate office as part their regular reporting mechanism for the subproject as a whole.

- The subproject maintains telephone number of hospitals, police and district administration and other government departments, in case of any emergency. A multi-purpose transport vehicle is stationed at subproject site at all times. Since the commissioning of the subproject, there has not been a single incident of any type. Other than this, the subproject does not have any emergency plan and neither any such plan is warranted by local laws and regulations, as informed by developer.
- The project is also subjected to Indian Electricity Regulations and has to confirm with respect to both safety and technical requirements, as part of testing and commissioning of subproject.
- The developer has informed that since the COD, there has been no damage of any panels (physical damage or out of service). If there is any damage, the same will be replaced by the panel supplier/manufacturer. All the panels carry a replacement warranty for 25 years (excluding physical damage). In case of any panel gets damaged, the matter will be reported to the manufacture/supplier, who will come to site with replacement and take away the damaged panel.
- The land is owned by the developer and the power purchase agreement is for 25 years and therefore project will remain operational for a minimum of 25 years from COD. The loan term with IREDA is only for 12 years from COD.
- At present, the developer has no plans in place for decommissioning but has informed that as a corporate entity they are committed to comply with all regulatory requirements as and when the decommissioning will be scheduled. Similarly, the developer, at present does not have any plans in place for the subsequent use of the land after decommissioning of subproject and/ or expiration of power purchase agreement.
- The subproject does not discharge any toxic waste. The handling of the used batteries come under the purview of The Batteries (Management and Handling) Rules, 2001 and 2010 and thus either used batteries are taken away by the suppliers of new batteries or sold to recyclers authorized by the State Pollution Control Board. The Battery (Management and Handling) Rules, 2001 and 2010 is provided as in **Annexure 10**.
- The subproject is using SMF (sealed maintenance free) batteries, which are highly recommended for inverters as they are safe and maintenance free. These SMF batteries

are fully sealed and emit no fumes as compared to lead acid batteries and thus also eliminates the need for routine maintenance like periodic water topping. In SMF batteries, the electrolyte used will be in the form of gel, which fills the cavities between battery plates and these batteries emit H_2 and O_2, but these gases combine to form water.

- As per the developer, SMF batteries normally have a life of some 24-30 months and batteries are replaced after this period and old /used batteries are taken away battery supplier and they do not have any storage areas within the subproject area.
- The dealers as well as consumers of batteries are covered under the Batteries (Maintenance and Handling) Rules, 2001 and 2010. Under the purview of these rules, the subproject developer is mandatorily required to deposit used batteries with the battery dealer or can dispose (auction off) off the batteries with the authorized/registered recyclers and submit returns to the State Pollution Control Board.

G. Further Actions Required

24. The ESDD indicated the requirement of following further actions for the subproject

- The developer has to earmark a budgetary provision for the environmental management plan for the operation phase and compliance of all consent conditions laid out by pollution control board. During the safeguards due diligence, the project developer has consented to earmark a budgetary provision for environmental management as per CTO requirements of the State Pollution Control Board and IREDA's loan covenant.
- The ESSU at IREDA shall ensure developer make budgetary provision and monitor implementation of the environmental management plan through developer's periodic environmental monitoring progress reports and undertake bi-annual due diligence visits to ensure satisfactory regulatory compliance to State Pollution Control Board.
- The ESSU at IREDA shall ensure that subproject developer maintains internal documentation on HSE as part of environmental management of subproject

H. Conclusion and Recommendations

25. The conclusions of the ESDD for the subproject are:

- This subproject has been prepared by the promoter cum developer as per their own investment plan supplemented by IREDA's loan assistance but not in anticipation of availability of funds to subproject through IREDA's LoC from ADB.
- The construction and operation of the 20 MW solar power project at Porbandar district, Gujarat State, India has no major significant environmental issues. The subproject has achieved Commercial Operations Date in April 2012 and since then generating solar power as per installed capacity.
- IREDA, through its ESSU is committed to monitor the regulatory compliance(s) at subproject site through developer's periodic progress reports and undertake bi-annual due diligence visits to subproject site.
- The current subproject will therefore be in compliance to ADB Safeguard Policy

Statement (SPS) 2009 and does not pose reputational risk to ADB funding on environmental safeguards and considered for LoC from ADB funding under the Clean Energy Investment Program.

PART II

SOCIAL SAFEGUARDS DUE DILIGENCE REPORT

SOCIAL DUE DILIGENCE REPORT

Subproject: **20 MW Solar Photovoltaic Power Project at Bapodar and Kerala Village in Porbandar in the State Of Gujarat (India)**

Developer: **Hiraco Renewable Energy Private Limited (HREPL) by Hindustan Cleanenergy Limited**

1. Introduction

Indian Renewable Energy Development Agency Limited (IREDA) is the single largest renewable energy financier in India and applied for ADB loan to fund as a part of its overall lending portfolio, to private sector renewable energy and energy efficiency subprojects in India, including small scale wind, biomass, small hydro, solar, cogeneration, and energy efficiency.

IREDA's mandate is to minimize the energy sector's negative environmental impact by promoting cleaner and more environmentally friendly technologies, and thus is committed to avoid and mitigate adverse environmental impacts, if any, resulting from the projects it finances. In order to identify and effectively address potential impacts from projects funded with the ADB line of credit, IREDA has formulated and adopted an Environment and Social Management System (ESSU), which is in compliance with Indian national laws and Asian Development Bank (ADB) Safeguard Policy Statement (SPS) 2009. The objective of the ESSU is to guide IREDA's actions to safeguard against adverse environmental and social impacts for sub-projects using ADB's funds.

Keeping in view the main objective of the ESSU, ADB social safeguard requirements and in confirmation with the national and local policy and legal framework, a social due diligence study has been carried out for the subproject i.e. 20 MW Solar Photovoltaic Power Project at Bapodar and Kerala Village in Porbandar in the State Of Gujarat (India) developed by Hiraco Renewable Energy Private Limited (HREPL).

2. Subproject Description

The project is implemented under the Solar Power Policy 2009 of Gujarat. Multi Crystalline Silicon PV solar cells shall be used in the project to generate electricity. HREPL ("the company") has already signed a PPA for 25 years with Gujarat Urja Vikas Nigam Limited (GUVNL) with permission from Government of Gujarat, for sale of power generated from the project.

The project is located at 21'37'39.4" (North) altitude and 69'49'57.1" (East) longitudes. The site is located in at Bapodar and Kerala Village in Porbandar District in the state of Gujarat, India. The surface topography is almost flat. Hence, limited site preparation/leveling activity was carried out to make the land flat as per the requirements of solar PV power plant. The entire area is shadow free as there are no shading elements like mountains, large sand dunes, etc. on the site. The map of the project location is provided in **Figure 1**.

Figure: 1 Project Site Map

The power generated from the solar power plant is being transmitted to 220kV/400kV (sub-station) situated at a distance of 13.5 kilometers known as Rana Kandorna owned by Gujarat Electricity Transmission Company Limited (GETCO) and the company has already signed a power purchase agreement with GETCO.

3. Subproject Status

The construction of the power plant was started in 2011. The land required for the project was directly purchased on the basis of willing buyer – willing seller basis from the landowners of three above-mentioned villages. There is no compulsory land acquisition for the subproject or no government or community land has been utilized for the plant. The power plant is fully operational since April 2012. The subproject developer has proposed this project to IREDA for a post commissioning (take-out) financing.

4. Scope of Review and Methodology

This social due diligence report is prepared based on review of various subproject documents, consultation with developers, field staff and on site observation. The documents reviewed for the subproject includes Initial Environmental Examination (IEE) Report, Social Safeguard Audit Report, and other related report like appraisal document provided by IREDA. During the subproject preparation stage the developer has not carried out any social impact assessment study as it has directly purchased land for the subproject. However, a social safeguard audit report was prepared for the project just after it's commissioning. Site visit was conducted during due diligence study in September-2016 and consulted with the field staff of Project Developer.

5. Social Safeguard Categorization and Rationale

On the basis of the review of project information and site observation, the Social Safeguard Screening Checklist (refer **Annexure 7**) was completed as per the requirement set forth in IREDA's Environmental and Social Safeguard Unit (ESSU). Based on the social safeguard checklist, it was established that the subproject is categorized as "Category-C" from both Involuntary Resettlement and Indigenous Peoples safeguard point of view. The Involuntary Resettlement Categorization form and the Indigenous Peoples Categorization form are attached in **Annexure 7**.

The rationale behind the social safeguard categorization as "C" i.e. the subproject does not require any further specific actions so far as the social safeguard point of view is because the subproject does not involve any involuntary acquisition of private land and does not have any negative impacts on people including indigenous community. The photograph of the subproject site is presented below in **Figure-2**.

Figure-2: Photograph of the Plant Site

6. Social Safeguard Issues under the Subproject

The social safeguard issues identified through the social due diligence process is discussed in the following section.

6.1 Land Acquisition Requirement under the Subproject

The land requirement for the subproject was for installation of solar panel, approach roads, switchyard and control room etc. all within the plant area. Total land requirement for the subproject was 144.37 acres. The land requirements for the solar power plant are presented in the Table: 1 below.

Table 1: Land Requirement for the Subproject

S No.	Name Of Khatedar (Owner)	Survey No.	Acre	Sale Deed No.	Date Of Registration
	Village: Bapodar				
1	Keshubhai Alabhai	148/1P1	2.40		

S No.	Name Of Khatedar (Owner)	Survey No.	Acre	Sale Deed No.	Date Of Registration
	Polabhai Alabhai			1230	12/05/11
2	Bhanubhai Alabhai	148/1	4.874	1231	12/05/11
3	Zanja Bhima	145/1/2	9.15	1246	13/05/11
	Arshi Bhima				
	Lila Bhima				
4	Sakarben Aalabhai	144/1P3	1.425	1242	13/05/11
5	Bhaoja Deva	144/1P1	2.850	1241	13/05/11
6	Kanabhai Maldebhai	146/2			
		146/3			
		146/4	3.60	1881	14/06/11
7	Bapodara Suka Malde Meru	144/4	4.326	1969	16/06/11
8	Bapodara Maldebhai Arjanbhai	145/1/3MA	1.20	513	21.1.2012
9	Bapodara Ganga Arjan	144/1P2, 144/3 & 150 P2	6.65	5030	18.10.2011
	Village : Kerala				
10	Mer Keshavabhai Rambhai	106/1	3.675	2108	23/06/11
	Bhima Ram				
	Raja Samla				
	Ranmal Samla				
	Mer Bhima Bhai Ram Bhai				
	Mer Keshav Bhai Ram Bhai				
	Mer Ram Bhaisamlabhai				
	Mer Rajabhai Samlabhai				
11	Kanbi Kanji Kala	106/2	3.675	2118	23/06/11
	Ranmal Samla				
	Raja Samla				
	Bhima Ram				
	Keshav Ram				
	Kanbi Shashikant Hiribhai				
	Kanbi Manojkumar Hirjibhai				
12	Bhalani Bhanubhai Jadavbhai	100/1P2	8.975	2200	28/06/11
	Bapodara Devabhai Murubhai				
	Bapodara Devabhai Murubhai				
13	Mer Rajsi Arsi	100/1 Paiki 1	7.00	4789	5.10.2011
	Mer Deva Arsi				
	Mer Lakhman Arsi				

S No.	Name Of Khatedar (Owner)	Survey No.	Acre	Sale Deed No.	Date Of Registration
14	Mer Meraman Rana	104 P 3	3.00	4779	5.10.2011
15	Dhulesiya Rakeshbhai Rasikbhai	111/2NI	3.32	5664	24.11.2011
16	Odedara Nharatbhai Karabhai	89P1P2	6.61	6145	17.12.2011
17	Odedara Karabhai Gangabhai	89P1P1	6.61	6146	17.12.2011
18	Odedara Vejabhai Karabhai	89P1P3	6.61	6147	17.12.2011
19	Patel Bhagwanjibhai Arjanbhai	111/1 NI	7.47	839	15.02.2012
20	Mer Nathabhai Keshavbhai	102 P 3	2.25	881	31/03/11
21	Mer Rajsi Jiva	104 P 4	3.05	907	07/04/11
22	Chavda Arjan Parbat	110 P 1	4.00	908	07/04/11
23	Chavda Bhikhan Arjan	110 P 2	10.825	910	07/04/11
24	Mer Arjan Arsi	101	0.075		
		102 P 1	2.225	948	11/04/11
25	Mer Viram Raja And Aebha Raja	102 P 2	2.25	949	11/04/11
26	Mer Deviben Jetha	80/1	1.875		
		80/3	1.85	960	11/04/11
27	Mer Jetha Rana	81	6.575	1461	24/05/11
	Mer Dilip Rana				
	Mer Harbham Rana				
28	Mer Miniben Arjan	108/2	4.450	2072	22/06/11
29	Chavda Puriben Hajibhai	111/3	3.075	2071	22/06/11
30	Mer Nagajan Meraman	77/P4	2.450	2707	23/06/11
31	Mer Keshav Bhima	104/P1	6.000	2683	13/07/11
	Mer Rambhiben Arsi	104/P2			
	Mer Lila Arsi				
	Mer Sakarben Arsi				
	Mer Jiva Jetha				
	Arjan Nathu				
Total			**144.37**		

As mentioned earlier the developer has directly purchased the land required for the subproject, from the landowner on willing seller - willing buyer basis through appointment of a land arranger. The land purchase for the project has been done as per section 55 of the Saurashtra Gharkhed Tenancy Settlement and Agriculture Land Ordinance 1949 (as amended in 19971) applicable in Gujarat. Section 55 outlines the provisions for the Sale of land for bonafide industrial purpose. Based on the assessment of sale deed agreements, it is confirmed that the land has been purchased from the owners directly clarifying the purpose of purchase and the land register has verified and certified that the land is encumbrance free and without any kind of litigation. It is confirmed in the social safeguard audit report that the compensation rates offered and paid to the landowners were higher than the prevailing circle rate. The Company has also obtained an NOC from the Panachayat and the copy of this NOC is provided in **Annexure 2** and the sample sale deed agreement administered for land purchasing is attached in **Annexure 11**.

The solar power plant will be using the associated facilities like access roads, transmission lines and sub-station. The project will utilize the existing village road; no new roads will be built as part of this project. The power generated from the proposed solar power plant would be evacuated through a 66kV transmission line to an existing sub-station (Rana Kandorna) of GETCO, situated about 13.5 km from the project site. As the project is planned under the Solar Power Policy (2009) of the state of Gujarat, and as per the terms of Power Purchase Agreement, it is the responsibility of GETCO to arrange, provide and maintain the power transmission evacuation facilities up to the 66 kV switchyard of the project. However, in the interest of meeting the commissioning schedule for the project, it was agreed between GETCO and the Company that the Company would manage the construction of transmission lines under the overall supervision and approval of GETCO.

For the Construction of the 66 kV transmission line from Hiraco Plant to the (Rana Kandorna) GETCO substation has been set up with 40 numbers of towers. Each tower footing required 75 sq.m of land. The cost of transmission line will be borne by CCPL. For setting up of transmission line towers, 50 landowners have been compensated for the temporary damages as per the Indian Telegraph Act and State policy. A total compensation of INR 8 Million has been paid or approximately INR 0.15 Million per tower footing. The period of payments to landowners and tower erection was December 2011 – March 2012. No further land acquisition or involuntary resettlement issues are expected from the use of the substations, which have been in existence for more than 15 years. The construction of transmission work has been executed under the supervision of GETCO engineers and in line with GETCO existing policies and frameworks.

6.2 Involuntary Resettlement Issues under the Subproject

Since there is no compulsory private land acquisition involved the subproject and the land has been purchased on the basis of willing buyer – willing seller basis, there does not arise any issue of involuntary resettlement. The landowners have directly sold their land to the developer and the lands are either barren or low-productive agricultural land. The landowners have only sold part of their land and not suffered any major livelihood loss. During the site visit it was observed that the land percales purchased for the subproject are away from the settlement area and therefore does not occurred any physical displacement.

In the Social Safeguard Audit report prepared in 2012, it is confirmed that the land sold for the project was not much productive for them because of the higher salt concentration in the ground

water. As per the land owners, the sale of land came as an opportunity to earn income from an otherwise unproductive land. The payment provided against the land purchased has helped these farmers to find alternative land in a more fertile area or start an alternate livelihood Also, as per the landowners; there were other productive plots that were available with them. Mostly cash crops such as cotton and groundnuts are cultivated in the region. The copy of Social Safeguard Audit Report is attached in **Annexure 12**.

It was informed by the project developer that during the construction period, many villagers were engaged as laborers including women. At present there is no construction work going on at site. However, some of the local people are employed directly and indirectly in the subproject. During the site visit it was found that out of one technician and office assistant from affected villages are working in the subproject. The security contractor is hired locally and he has engaged 11 guards from the affected villages working in two shifts. The cleaning vendor associated with the developer is also from same village and engaged 8 laborers and four drivers locally.

6.3 Indigenous Peoples Issues under the Subproject

According to the Census of India 2011 statistics, Scheduled Tribe (ST) population of Porbandar district is below 2.23%. It is confirmed from the census information that no indigenous people are present in the subproject villages and none of the land purchased for the subproject belongs to the ST community. The same has been also confirmed in the Social Safeguard Audit report accessing through public consultation. Hence, there has been no issue of indigenous people identified under the subproject.

The project is not directly benefiting the ST community as the power generated from the plat will be connected to transmission grid only and does not have any role in distribution system. However, at larger level, the power generation will definitely strengthen the power supply system of the area as a whole and hence indirectly benefit all communities including ST in the area.

7. Public Consultation under the Subproject

During various stages of subproject preparation, public consultation meetings were carried out involving various stakeholders. The project developer has informed the villagers about the project during very inception stage. The stakeholders engaged in the consultation process included village *panchayat*, village community, landowners, local administration, revenue officers, and various line departments. In addition to the social safeguard issues discussed in the above sections, some of the other relevant subproject specific issues such as subproject benefit, community participation, CSR policy and activities and grievance redress mechanism etc. discussed during the consultation.

During project construction, the Company held meetings and public consultations with the residents of Bapodar and Kerala villages and it was confirmed in the Social Safeguard Audit report as well. The Company made a presentation on the proposed project, development prospects, project impacts and measures to mitigate possible negative impacts. The prospects of improving social and economic status of the region as a result of a successful project implementation as well as corporate social responsibility (CSR) activities of the Company were also discussed. The CSR activities proposed by the Company and to be taken up during the operational phase of the project include:

- Community development programs
- Education program for children
- Women Empowerment programs

8. Grievance Redress Mechanism for the Subproject

Environmental and social grievances were handled in accordance with the project grievance redressal mechanism defined under the HR policy for contractors. The Grievance Redressal Mechanism (GRM) for the project provides an effective approach for complaints and resolution of issues made by the affected community in a reliable way. This mechanism was established prior to construction and will remain active throughout the life cycle of the project. A Grievance Redressal Committee (GRC) was formed at the project site to ensure affected people's grievances on both environmental and social concerns are adequately addressed and facilitate timely project implementation. The GRC was established comprising the; Project head, Liasoning officer – Site In charge/Admin and Land seller /Local Community Member. The detail of grievance redress mechanism was communicated during the process of public consultations.

The Project Head is responsible for capturing, identifying, maintaining enquiries associated with community grievance in a register, and communicating progress to the concerned community member. A Register to document the grievance if any is available at site. However, at the Hiraco site, there are no grievances related to land acquisition or from local community. During the site visit, it is observed that a complain register was available in their site office but found no complain registered in it.

9. Community Development Initiatives by the Subproject

The subproject has created employment opportunities for local people and utilizing local resources in terms of employment of local laborers, hiring machines and manpower for transportation of materials and equipment during construction. During the site visit it was observed that local peoples are trained and engaged as skilled and unskilled manpower. Security and Cleaning contract has been given to the local people only. In addition to one technical staff, all the security guards (11) and cleaning staff (13) are also locally engaged.

As a part of its corporate social responsibility (CSR) program, the developer has assessed some local needs and planning to take up following activities as a part of Community Development Plan for the villages near the plant.

- Upgrading local infrastructure like school and health center.
- Educate villages about methods to replenish underground water.
- Support for repair /strengthening of existing water resources.
- Strengthening of existing roads in the villages

The developer has already initiated some of the community development initiatives like repairing and maintenance of common road used for the plant and villages, and strengthening of existing community hall. It is observed that no further specific CSR plan is available with the developer. However, it was informed that as per their corporate policy, they would continue the activities in the subproject area.

10. Conclusion and Recommendations

The social due diligence study of current subproject reveals that it has not caused any adverse social impact due to the intervention. The subproject is categorized as Category "C" form social safeguard point of view. The private land required for the subproject is directly purchased from landowners by paying market value to the landowners and no compulsory acquisition of land occurs in the subproject, therefore no involuntary resettlement occurs.

As per the ESMS requirement, no further action including resettlement planning, livelihood planning or indigenous peoples planning is required for the subproject. However, the developer will continue to engage the local villagers throughout the operation period and carry out CSR activities in the area. It is recommended that the developer should prepare annual CSR plan and implement in the subproject area to benefit the local community.

Based on the findings of due diligence study the subproject is recommended for funding under the proposed project using ADB line of credit. IREDA will ensure compliance of ESSU and carry out periodic monitoring of the social safeguard issue and report to ADB as agreed in the ESSU.

Annexure 1

The notification of MoEF & CC

Press Information Bureau
Government of India
Ministry of Environment and Forests
05-March-2016 14:13 IST
Environment Ministry releases new categorisation of industries

'Re-Categorisation of Industries a landmark decision, new category of white industries will not require environmental clearance': Javadekar

The Government today released a new categorization of industries based on their pollution load. Releasing the new categorization here today, Minister of State (Independent Charge) of Environment, Forest and Climate Change, Shri Prakash Javadekar, said, "The new category of White industries which is practically non-polluting will not require Environmental Clearance (EC) and Consent and will help in getting finance from lending institutions. The exercise of Re-categorization was being carried out for last one year. This is a landmark decision to give a fair picture of the industries".

"Re-categorization of industries based on their pollution load is a scientific exercise. The old system of categorization was creating problems for many industries and was not reflecting the pollution of the industries. The new categories will remove this lacuna and will give clear picture to everyone. 25 industrial sectors which were not critically polluting were also earlier categorized as Red. This was creating wrong impression to everyone", Shri Javadekar added.

The Ministry of Environment, Forest and Climate Change (MoEFCC) has developed the criteria of categorization of industrial sectors based on the Pollution Index which is a function of the emissions (air pollutants), effluents (water pollutants), hazardous wastes generated and consumption of resources. For this purpose the references are taken from the the Water (Prevention and Control of Pollution) Cess (Amendment) Act, 2003, Standards so far prescribed for various pollutants under Environment (Protection) Act , 1986 and Doon Valley Notification, 1989 issued by MoEFCC. The Pollution Index PI of any industrial sector is a number from 0 to 100 and the increasing value of PI denotes the increasing degree of pollution load from the industrial sector. Based on the series of brain storming sessions among CPCB, SPCBs and MoEFCC , the following criteria on 'Range of Pollution Index 'for the purpose of categorization of industrial sectors is finalized.

- Industrial Sectors having Pollution Index score of 60 and above - Red category
- Industrial Sectors having Pollution Index score of 41 to 59 – Orange category
- Industrial Sectors having Pollution Index score of 21 to 40 – Green category
- Industrial Sectors having Pollution Index score incl.&upto 20 - White category

The salient features of the 'Re-categorization' exercise are as follows:

- Due importance has been given to relative pollution potential of the industrial sectors based on scientific criteria. Further, wherever possible, splitting of the industrial sectors is also considered based on the use of raw materials, manufacturing process adopted and in-turn pollutants expected to be generated.
- The Red category of industrial sectors would be 60.
- The Orange category of industrial sectors would be 83.
- The Green category of industrial sectors would be 63.
- Newly-introduced White category contains 36 industrial sectors which are practically non-polluting.

- There shall be no necessity of obtaining the Consent to Operate'' for White category of industries. An intimation to concerned SPCB / PCC shall suffice.
- No Red category of industries shall normally be permitted in the ecologically fragile area / protected area.

The details of the industries falling under Red, Orange , Green and White categories are presented in tables 1, 2, 3& 4 respectively (given below).

The newly introduced White category of industries pertains to those industrial sectors which are practically non-polluting, such as Biscuit trays etc. from rolled PVC sheet (using automatic vacuum forming machines), Cotton and woolen hosiers making (Dry process only without any dying/washing operation), Electric lamp (bulb) and CFL manufacturing by assembling only, Scientific and mathematical instrument manufacturing, Solar power generation through photovoltaic cell, wind power and mini hydel power (less than 25 MW).

The purpose of the categorization is to ensure that the industry is established in a manner which is consistent with the environmental objectives. The new criteria will prompt industrial sectors willing to adopt cleaner technologies, ultimately resulting in generation of fewer pollutants. Another feature of the new categorization system lies in facilitating self-assessment by industries as the subjectivity of earlier assessment has been eliminated. This 'Re-categorization' is a part of the efforts, policies and objective of present government to create a clean & transparent working environment in the country and promote the Ease of Doing Business.

Other similar efforts include installation of Continuous Online Emissions/ Effluent Monitoring Systems in the polluting industries, Revisiting the CEPI (Comprehensive Environment Pollution Index) concept for assessment of polluted industrial clusters, revision of existing industrial emission/effluent discharge standards, initiation of special drive on pollution control activities in Ganga River basin and many more in the coming days.

Annexure

Table 1 : List of Red Category of Industries

Sl No.	Industry Sector	Sl No.	Industry Sector
1	Isolated storage of hazardous chemicals	39	Yarn / Textile processing
2	Automobile Manufacturing (integrated)	40	Chlor Alkali
3	Hazardous waste recycling (Spent cleared metal catalyst)	41	Ship Breaking
4	Lubricating oils and grease mfg.	42	Oil and gas extraction
5	DG Set (> 5 MVA)	43	Metal surface treatment
6	Carbon black & allied	44	Tanneries
7	Lead acid battery	45	Ports /harbor/jetties
8	Phosphate rock processing	46	Synthetic fibers
9	Power generation plant	47	Thermal Power Plants
10	Hazardous Waste Recyclers (Spent catalyst)	48	Slaughter house
11	Chlorinated hydrocarbons	49	Aluminium Smelter
12	Sugar	50	Copper Smelter
13	Fibre glass production	51	Fertilizer (basic)
14	Fire crackers	52	Integrated Iron & Steel
15	E-Waste Recyclers	53	Pulp & Paper (bleaching)
15	Milk and dairy products	54	Zinc Smelter
17	Phosphorous	55	Oil Refinery
18	Pulp & Paper	56	Petrochemicals
19	Coke making	57	Pharmaceuticals
20	Explosives / detonators	58	Pulp & Paper (Large-Agro + wood),
21	Paints varnishes, pigments	59	Distillery
22	Organic Chemicals	60	Railway locomotive work shop/ service centers
23	Airports and Commercial Air Strips		
24	Asbestos		
25	Basic chemicals		
26	Cement		
27	Chlorates, per-chlorates & peroxides		
28	Chlorine, fluorine, bromine, iodine		
29	Dyes and Dye- Intermediates		
30	Health-care Establishment		
31	Hotels (Big)		
32	Lead acid battery -recyclers		
33	Waste electrical and electronic recyclers		
34	Glue and gelatin		
35	Mining and ore beneficiation		
36	Nuclear power plant		
37	Pesticides		
38	Photographic film /chemicals		

Table 2 : LIst of Orange Category of Industries

Sl. No.	Industry Sector	Sl. No.	Industry Sector
1	Almirah, Grill Manufacturing	43	Large Cotton spinning and weaving
2	Aluminium & copper extraction from scrap	44	Lime manufacturing (using lime kiln)
3	Automobile servicing, repairing	45	Liquid floor cleaner, black phenyl
4	Ayurvedic and homeopathic medicine	46	Manufacturing of glass
5	Brickfields	47	Manufacturing of mirror from sheet glass
6	Building and construction >20,000 sq. m	48	Manufacturing of mosquito repellent coil
7	Cashew nut processing	49	Manufacturing of Starch/Sago
8	Ceramics and Refractories	50	Mechanized laundry using oil fired boiler
9	Chanachur and ladoo using husk fired oven	51	Medium scale Hotels
10	Coal washeries	52	Modular wooden furniture
11	Coated electrode	53	New highway construction project
12	Coffee seed processing	54	Non-alcoholic beverages(soft drink)
13	Compact disc computer floppy	55	Paint blending and mixing (Ball mill)
14	Copper waste recyclers	56	Paints and varnishes (mixing and blending)
15	Dairy and dairy products (small scale)	57	Parboiled Rice Mills
16	DG set (>1MVA but < 5MVA)	58	Pharmaceutical formulation
17	Dismantling of rolling stocks	59	Ply-board manufacturing
18	Dry cell battery	60	Potable alcohol (IMFL) by blending
19	Dry coal / mineral processing	61	Printing ink manufacturing
20	Fermentation (Extra Neutral Alcohol)	62	Printing or etching of glass sheet
21	Ferrous and Non- ferrous metal extraction	63	Printing press
22	Fertilizer (granulation / formulation / blending	64	Producer gas plant
23	Fish feed, poultry feed and cattle feed	65	Recyclers - used oils
24	Fish processing and packing	66	REcyclers - waste oils
25	Flakes from rejected PET bottle	67	Recycling - Paint and ink Sludge
26	Foam manufacturing	68	Reprocessing of waste plastic /PVC
27	Food and food processing	69	Rolling mill (oil or coal fired)
28	Forging of ferrous and non- ferrous	70	Silica gel
29	Formulation/pelletization of camphor tablets etc.	71	Silk /saree screen printing
30	Glass ceramics, earthen potteries and tile	72	Spray painting
31	Gravure printing, digital printing on flex, v	73	Steel and steel products with furnaces
32	Heat treatment using oil fired furnace	74	Stone crushers
33	Hot mix plants	75	Surgical and medical products (latex)
34	Ice cream	76	Synthetic detergents and soaps
35	Industry or processes involving foundry operations	77	Synthetic resins
36	Iodized salt from crude/ raw salt	78	Synthetic rubber excluding molding
37	Jute processing without dyeing	79	Tephlon based products
38	large Bakery and confectionery	80	Thermocol manufacturing (with boiler)
39	Transformer repairing/ manufacturing	81	Thermometer
40	Tyres and tubes vulcanization/ hot retread	82	Tobacco products including cigarettes
41	Vegetable oil manufacturing	83	Tooth powder, toothpaste, talcum powder
42	Wire drawing and wire netting		

Table 3 : List of Green category of Industries

Sl. No.	Industry Sector	Sl. No.	Industry Sector
1	Aluminium utensils	36	Ready mix cement concrete
2	Ayurvedic medicines	37	Reprocessing of waste cotton

3	Small Bakery /confectionery	38	Rice mill (Rice hullers only)
4	PP film	39	Rolling mill (gas fired) and cold rolling mill
5	Biomass briquettes	40	Rubber goods (gas operated baby boiler)
6	Melamine resins	41	Saw mills
7	Brass and bell metal utensils	42	Soap manufacturing
8	Candy	43	Spice Blending
9	Cardboard / corrugated box	44	Spice grinding
10	Carpentry & wooden furniture	45	Steel furniture
11	Cement products	46	Grains processing
12	Ceramic colour by mixing	47	Tyres /tube retreating
13	Chilling plant and ice making	48	Chilling /ice plant
14	Coke briquetting	49	CO2 recovery
15	Small Cotton spinning and weaving	50	Distilled water
16	Dal Mills	51	Small Hotels
17	Decoration of ceramic cups	52	Optical lenses
18	Digital printing on PVC clothes	53	Mineralized water
19	Handling, storage of food grains	54	Tamarind powder
20	Flour mills	55	Marble stone
21	Electrical Glass , ceramic, earthen potteries	56	Emery powder
22	Glue from starch	57	Flyash export
23	Gold and silver smithy	58	Mineral stack yard
24	Non-polluting Heat treatment	59	Oil and gas transportation pipeline
25	Insulation /coated papers	60	Seasoning of wood
26	Leather foot wear /products	61	Synthetic detergent
27	Blending of Lubricating oil, greases	62	Tea processing
28	Pasted veneers	63	Pulverization of bamboo
29	Oil mill Ghani		
30	Packing materials		
31	Phenyl/toilet cleaner		
32	Polythene and plastic products		
33	Poultry, Hatchery and Piggery		
34	Power looms (without dye and bleaching)		
35	Puffed rice (muri) (gas or electrical heating)		

Table 4 : List of White category of Industries

Sl. No.	**Industry Sector**
1.	Air coolers /conditioners
2.	Bicycles ,baby carriages
3.	Bailing of waste papers
4.	Bio fertilizer /bio-pesticides
5.	Biscuits trays

6.	Blending / packing of tea
7.	Block making of printing
8.	Chalk making
9.	Compressed oxygen gas
10.	Cotton and woolen hosiers
11.	Diesel pump repairing
12.	Electric lamp (bulb) and CFL
13.	Electrical and electronic item
14.	Engineering and fabrication units
15.	Flavoured betel nuts
16.	Fly ash bricks/ block
17.	Fountain pen
18.	Glass ampules
19.	Glass putty and sealant
20.	Ground nut decorticating
21.	Handloom/ carpet weaving
22.	Leather cutting and stitching
23.	Coir items from coconut husks
24.	Metal caps containers etc
25.	Shoe brush and wire brush
26.	Medical oxygen
27.	Organic and inorganic nutrients
28.	Organic manure
29.	Packing of powdered milk
30.	Paper pins and u clips
31.	Repairing of electric motors /generators
32.	Rope (plastic and cotton)
33.	Scientific and mathematical instrument
34.	Solar module non-conventional energy apparatus
35.	Solar power generation through solar photovoltaic cell, wind power and mini hydel power (less than 25 MW)
36.	Surgical and medical products assembling

GUJARAT POLLUTION CONTROL BOARD
"PARYAVARAN BHAVAN"
SECTOR: 10-A, GANDHINAGAR-382010
: OFFICE ORDER:

No: GPCB/P-1/12/332040 Date: 12.04.2016

Ref: Office Circular no: 1) P/378/17309 dtd. 13.9.1991
Office Circular no: 2) P/693/SLZ/32831 dtd. 28.10.2002

The Gujarat Pollution Control Board has published a list of category of cottage and small scale industries having no pollution potential vide reference (2) above. Such industries are exempted from obtaining Consent to Establish from GPCB.

Now that the CPCB has published "Final document on Revised Classification of **Industrial Sectors under Red, Orange, Green and White Category" on 29.2.2016** classifying various industries into Red, Orange, Green and White Categories. According to this classification, the White category of industries do not require Consent to Establish and Consent to Operate permits from respective SPCBs.

The CPCB vide its letter no: B-29012/2SS(CPA)/2015-16/8570 dated 07.03.2016 also issued necessary directions under Section 18 (1) (b) of the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 regarding harmonization of classification of industrial sectors under the Red, Orange, Green and White categories.

The matter was further discussed in Boards 210th meeting held on dt 10.3.2016 and the Board has adopted the above classification and decided to exempt the White category of industries mentioned in the above mentioned documents of the CPCB from the requirement of Consent to Establish and Consent to Operate from the GPCB. Further the GPCB has also decided to add a few more industrial activities under White Category where there is absolutely no pollution potential and also decided that such industries

would not need Consent to Establish and Consent to Operate from the GPCB hereafter. A list of those industries which are exempted from obtaining the Consent to Establish and Consent to Operate are appended herewith at "Annexure-I" to this Office Order.

Any further confusion leading to the classification of any industry which are otherwise not covered under the above mentioned document of GPCB would be brought to the notice of the Member Secretary, GPCB for putting up the Agenda in the committee constituted for "categorization of Industries" Vide GPCB Office Order no:P-1/14/132996 dated 10.7.2013. Further the respective Unit Heads / Regional Officers of the Board shall also bring any such case coming to their notice which are not directly covered under the Red/ Orange/ Green/ White categories or leading to any type of confusion to the notice of the Categorization Committee mentioned herein above.

Issued after the approval of the Chairman.

For & on behalf of
Gujarat Pollution Control Board

Sd/
(HARDIK SHAH)
Member Secretary

Encl: Annexure-I

Copy to:

1. All Taluka Development Officer
2. All District Development Officer
3. All District Collector
4. Gujarat Electricity Board, Vadodara
5. Dakshin Gujarat Vij Company Limited, Surat
6. Madhya Gujarat Vij Company Limited, Vadodara
7. Uttar Gujarat Vij Company Limited, Mehsana
8. Paschim Gujarat Vij Company Limited, Rajkot
9. Torrent Power Limited, Ahmedabad/Surat
10. Secretary, Revenue Department
11. Additional Chief secretary, Industries and Mines Department
12. Principal Secretary, Forests & Environment Department
13. All Industries Associations
14. All Regional Officer
15. All Unit Heads

: Annexure :

List of Green Category Industries exempted from obtaining Consent to Establish (CTE) & Consolidated Consent & Authorization (CC&A)

(List of Industries having no pollution potential) (i.e. White Category)

Sr. No.	Name and Type of Industrial Activities
1.	Agricultural services not elsewhere classified (like harvesting & threshing)
2.	Assembling units for TV, VCR, Radio sets, Tape Recorders, etc.
3.	Assembling units of air coolers/conditioners, Water coolers, Heater, electric fans as well as repairing and servicing.
4.	Assembly of bicycles, baby carriages and other small non motorizing vehicles
5.	Attar formulation units
6.	Button & hooks manufacturing units
7.	Bio fertilizer and bio-pesticides manufacturing units (without using inorganic chemicals)
8.	Biscuits trays etc. manufacturing units (from rolled PVC sheet using automatic vacuum forming machines)
9.	Block making of printing without foundry (excluding wooden block making)
10.	Corianders, Cumins, Turmeric, Salts grinding units
11.	Cotton ginning & pressing units
12.	Compressed oxygen gas manufacturing units from crude liquid oxygen (without use of any solvents and by maintaining pressure & temperature only for separation of other gases)
13.	Cotton & woolen hosiers making units (dry process only without any dying / washing operation)
14.	Chalk making from plaster of Paris (only casting without boilers etc., sun drying / electrical oven)
15.	Computer and peripheral assembling units
16.	Ceramic products manufacturing by sun drying
17.	Common salt crushing and packing units
18.	Distributors of agricultural machinery and equipment
19.	Distributor of industrial machinery and equipment other than electrical
20.	D.G. Set installation having capacity up to 1000 kVA
21.	Diamond Industries
22.	Diesel pump repairing & servicing centre (complete mechanical dry process)
23.	Embroidery work, zari work and ornamental trimmings carrying units (by hand)
24.	Engineering workshop, machine shop, fabrication shop, sminy shop, turning shop,

Sr. No.	Name and Type of Industrial Activities
	cutting shop
25.	Footwear manufacturers from plastic / PVC
26.	Fabricating units for aluminum doors, windows and furniture (only assembling).
27.	Fabricating units for drawing, surveying and scientific equipment
28.	Fabricating units for iron doors and shutters (without electroplating, spray painting & powder coating)
29.	Fabricating units for stove, cooker, kitchen equipment etc. (without electroplating, spray painting & powder coating)
30.	Fabricating units for tractor trailer, agricultural equipment etc. (without electroplating, spray painting & powder coating)
31.	Fabricating units for vehicle parts without electroplating, heat treatment, spray painting and powder coating
32.	Fountain pen manufacturing units (assembling only)
33.	Frying of dals and other cereals n.e.c.
34.	Electric lamp (bulb and CFL) manufacturing units (assembling only)
35.	Electro magnets, fans, armature, coils and electro-magnetic instruments (assembling only)
36.	Electrical & electronic item assembling (completely dry process)
37.	Engineering & fabrication units (dry process without any heat treatment / metal surface finishing operations / painting)
38.	Floriculture & horticulture
39.	Flavored betel nuts production / grinding units (completely dry mechanical operations)
40.	Fly ash bricks / block manufacturing units
41.	Glass ampoules and vials making units from glass tubes
42.	Generation of energy through wind mills
43.	Glass putty and sealant manufacturing units (by mixing with machine only)
44.	Groundnut decorticating units (only dry process)
45	Hand loom/ carpet weaving units (without dying and bleaching operation)
46.	Inland water fishing
47.	Industrial items from engineering plastics by fabrication process only
48.	Jute and natural fiber goods making units
49	Jute and mesta pressing and baling units
50	Leather cutting and stitching units (Less than 10 machines using motor)
51	Mamra manufacturing units
52	Making of aces and finger by hand
53.	Manufacturing units of Articles of paper (used as containers)
54	Manufacturing units of Agarbatti's
55.	Manufacturing units of straw, basketware and wickerware
56	Manufacturing units of blankets, shawls, carpets, rugs (only weaving)
57.	Manufacturing units of purses and ladies handbags, artistic leather presentation from ready leather
58.	Manufacturing of blankets and shawls by hand
59.	Manufacturing of cotton carpets by hand

Sr. No.	Name and Type of Industrial Activities
60.	Manufacturing of matches on cottage scale
61.	Manufacturing of woolen carpets by hand
62.	Manufacturing of silk carpets by hand
63.	Manufacturing of durries, druggets and rugs by hand
64.	Manufacturing of raincoats, hats, caps and school bags
65.	Manufacturing of made-up textile articles (without bleaching, dyeing & printing)
66.	Manufacturing of curtains, bed-covers and furnishings û hand embroidered
67.	Manufacturing of curtains, bed-covers and furnishings û hand printed (without dyeing & printing)
68.	Manufacturing of crocheted made-up textile goods, except apparel
69.	Manufacturing of made-up canvas goods such as tents and sails etc.
70.	Manufacturing of candles on cottage scale
71.	Manufacturing of furniture from bamboo (Without pulverization)
72.	Manufacturing of glass bangles
73.	Manufacturing of glass decoration pieces
74.	Manufacturing of gypsum boards
75.	Manufacturing of rolling shutters of iron or steel (without spray painting)
76.	Manufacturing of locks (without electroplating / anodising)
77.	Manufacturing of oil stoves (pressure and non-pressure)
78.	Manufacturing of carrom boards and tables for billiards, table tennis and others
79.	Manufacturing of billiard sticks, hockey sticks, cricket bats, stumps and others
80.	Manufacturing of rackets for badminton, lawn tennis, table tennis, etc.
81.	Manufacturing of balls including those of billiards
82.	Manufacturing of brushes/dusters and similar articles of feathers
83.	Manufacturing of advertising sign-boards and displays etc.
84.	Manufacturing of garment by stitching from ready cloth
85.	Manufacturing of hosiery items / garments by stitching only
86.	Manufacturing of musical instruments
87.	Manufacturing of paper napkins, dishes, labels, paper rolls from ready paper
88.	Manufacturing of Stove Works
89.	Manufacturing of sports kit
90.	Paper pins and U clips
91.	Manufacturing of toys (only assembling)
92.	Manufacturing of umbrellas (only assembling)
93.	Manufacturing of market basketry, grain storage bins, ration baskets and similar
94.	Manufacturing from cane and bamboo of shopping bags, ornament boxes
95.	Manufacturing of articles made of palm leaf, screwpine, caf and khajoor leaf
96.	Manufacturing of wooden industrial fixtures such as bobbins, spools, sewing ruler
97.	Manufacturing of wooden tool handles
98.	Manufacturing of broomsticks
99.	Manufacturing of wooden toys, decoration pieces and wooden lamp stands, etc.
100.	Manufacturing of wooden agricultural implements
101.	Manufacturing of other wooden household products n.e.c.
102.	Manufacturing of paper cups, saucers, plates and other similar products
103.	Manufacturing of coir items from coconut husk

Sr. No.	Name and Type of Industrial Activities
104.	Manufacturing of domestic flour mill (without plating, electroplating and heat treatment)
105.	Manufacturing of fork-knife, scissors
106.	Manufacturing of frames for spectacles (only assembling)
107.	Manufacturing of shoe brush & wire brush
108.	Manufacturing of all types of threads, cordage, twines etc.
109.	Manufacturing of weighing machines
110.	Manufacturing of bullock-carts, push-carts and hand-carts etc.
111.	Manufacturing of coir rope and cordage
112.	Manufacturing of other rope and cordage including that of jute / mesta and coir
113.	Manufacturing of nets (except mosquito nets)
114.	Manufacturing of tapes, niwar and wicks etc.
115.	Manufacturing of handicraft / decorative / fancy items, n.e.c.
116.	Motor Rewinding
117.	Manufacturing of metal caps, containers etc.
118.	Measuring / controlling / regulating instruments manufacturing units
119.	Medical oxygen
120.	Manufacturing of photo frame, mirror frame
121.	Manufacturing of boora
122.	Manufacturing of screw, nut-bolts etc.
123	Manufacturing of cement concrete pipe, spun pipe, mosaic tiles, pillars
124	Manufacturing of lock-net of cement concrete
125	Manufacturing of pickle and papad up to 500 kg/day
126	Non-Electrical machine tools manufacturing units
127	Non-Motorized cycles / wheelchairs & parts manufacturing
128	Ocean, sea and coastal fishing
129	Organic & inorganic nutrients manufacturing (by physical mixing)
130	Organic manure manufacturing (mineral mixing)
131.	Painting and decorating work for constructions
132.	Production of firewood / fuel wood (including charcoal by burning) by exploitation
133.	Packing of powdered milk
134.	Pump and motor assembling units
135.	Processing of dry rice
136	Processing of edible nuts except oil expeller
137	Processing of groundnuts except oil expeller
138.	Printed books, Notebooks, Registers and other printed materials
139.	Printing of cloth by hand
140.	Newspaper printing press
141.	Rope (plastic and cotton)
142.	Repairing of electric motors & generators (dry mechanical process)
143.	Silk, cotton and other materials apparel manufacturing units
144.	Sun drying of fruits & vegetables
145.	Sun drying of fish
146.	Salt manufacturing at cottage scale
147.	Salt quarrying and screening etc.

Sr. No.	Name and Type of Industrial Activities
148.	Soil conservation services
149.	Scientific services like soil testing
150.	Soil desalination services
151.	Scientific & mathematical instrument manufacturing
152.	Solar module non conventional energy apparatus manufacturing unit
153.	Stainless steel in primary and finished forms
154.	Solar power generation through solar photovoltaic cell, wind power and mini hydel power (less than 25 MW)
155.	Spinning, weaving and finishing of coir textiles
156.	Spinning, weaving and finishing of sann hemp and other vegetable fibre textile
157.	Surgical and medical products assembling only (not involving effluent / emission generating processes)
158.	Tea blending & packaging units
159.	Transformer assembling units
160.	Timber works such as fixing of doors, windows and panels etc.
161.	Units doing book-binding, making file covers, envelopes, paper bags from paper or board
162.	Units carrying Electrical installation work for constructions
163.	Various types of Hand Tools manufacturing
164.	Warehousing of agricultural products without refrigeration
165.	Wool spinning, weaving and finishing other than in mills
166.	Weaving and finishing of cotton khadi
167.	Workshop for vehicles repairing
168	Waste papers baling process (hydraulic press)

Annexure 2

NOC from Village Panchayat

ગ્રામ પંચાયત બાપોદર

સરપંચ શ્રી : મીણીબેન ભીમાભાઈ બાપોદરા

મુ. બાપોદર તા. રાણાવાવ જિ. પોરબંદર ફોન : ૦૨૮૦૧ - ૨૩૮૭૧૪

તારીખ : 3/6/22

જા. નંબર :

પ્રતિ શ્રી, હિરાકો રિન્યુએબલ ઇન્ડિયા પ્રા. લિ. કંપની
૨૦ મેગાવોટ

વિષય :- અનુમતિ પત્ર બાબત

[illegible] જણાવવાનું કે હિરાકો રિન્યુએબલ [illegible] પ્રા. લિ. ના ૨૦ મેગાવોટ સોલાર પ્રોજેક્ટનું બાંધકામ [illegible] કરવામાં આવે છે. જેમાં ગ્રામ પંચાયત વિસ્તારમાં બાંધકામ [illegible] આ પ્રોજેક્ટની [illegible] અધિકારીશ્રીઓને [illegible] પ્રોજેક્ટના બાંધકામના કામમાં [illegible] છે. [illegible] કોઈ વાંધો નથી.

[illegible]

તલાટી-કમ-મંત્રી
બાપોદર ગ્રુપ
તા. રાણાવાવ જી. પોરબંદર

સરપંચશ્રી
શ્રી બાપોદર ગ્રામ પંચાયત
તા. રાણાવાવ જિ. પોરબંદર

3/9/2011

To,

Hiraco Renewable Energy Pvt Ltd.

Subject: No Objection letter

Jai hind, respectfully this is to inform you that we are aware about the construction work of 20MW Solar Project in area under the Gram Panchayat, Bapodar.

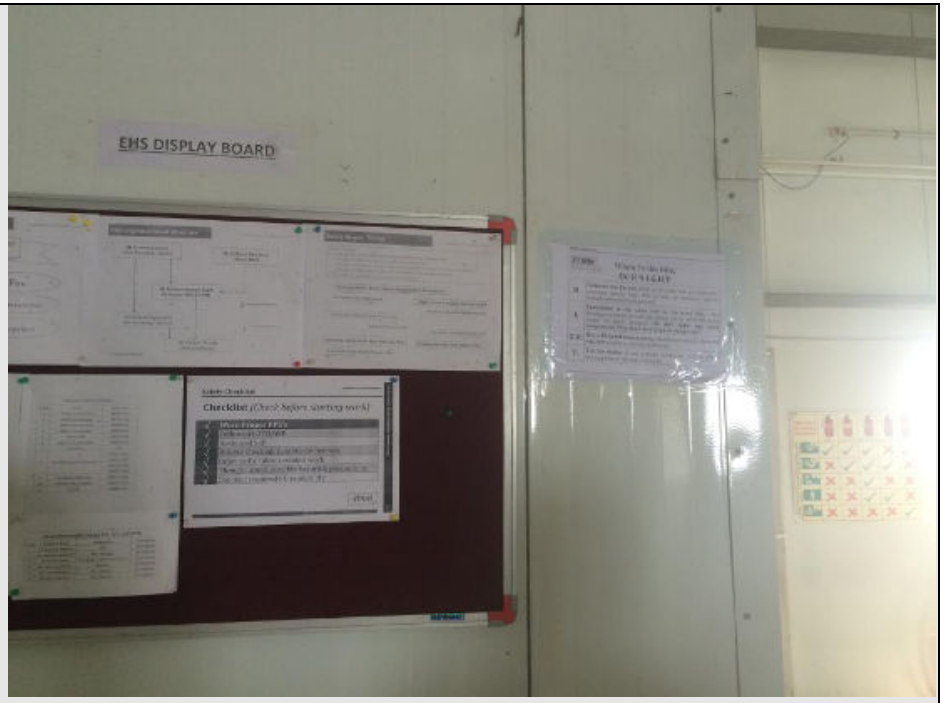
All concerned Gram Panchayat responsible persons are aware of progress/construction on site and have no objection on this development. This project is 15km away from highway and 2Kms for the village.

Muniben Bhimabhai
Sarpanch

Annexure 3

Site Photographs taken during Due-Diligence Site Visit

	
Approach to Project Site	**Internal Road at the site**



EHS Guidelines and Safety Equipments

	
Commissioned Solar Power Plant at Surendranagar, Gujarat	**Switch Yard**

Annexure 4

Copy of Ministry of Civil Aviation Rules, 2015

MINISTRY OF CIVIL AVIATION

NOTIFICATION

New Delhi, the 30th September, 2015

G.S.R.751 (E).—The Central Government, being of opinion that it is necessary and expedient to do so for the safety of aircraft operations, proposes to make the following certain rules, in exercise of the powers conferred by sub-section (1) and clause (o) and clause (r) of sub-section (2) of section 5 read with section 9A of the Aircraft Act, 1934 (XXII of 1934) (hereinafter referred to as the said Act), and in supersession of the Ministry of Civil Aviation notification number S.O.84(E), dated the 14th January, 2010 published in the Gazette of India, Part II, section 3, sub-section (ii), except as respect things done or omitted to be done before such supersession. The objections or suggestions on the draft S.O. were called from the stakeholders and are considered by the Government to the extent admissible. In the public interest the rules are notified by seeking exemption from putting the rules again in the public domain.

1. **Short title and commencement.— (1)** These rules may be called the Ministry of Civil Aviation (Height Restrictions for Safeguarding of Aircraft Operations) Rules, 2015.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. **Application .—** These rules shall apply to all civil and defence aerodromes listed in Schedule III to Schedule VII, as amended from time to time.

3. Definitions.— In these rules, unless the context otherwise requires, —

(i) "Act" means the Aircraft Act, 1934 (XXII of 1934);

(ii) "aerodrome" includes civil and defence airports, airstrips, communication, navigation and surveillance facilities used for the aeronautical purposes in India;

(iii) "aerodrome elevation**"** means the elevation of the highest point of the landing area as specified in Schedule III to Schedule VII;

(iv) "Authorised officer" means the officer authorised by the defence authorities for the purposes of these rules;

(v) "Airports Authority" means the Airports Authority of India constituted under section 3 of the Airports Authority of India Act, 1994 (55 of 1994);

(vi) "Colour Coded Zoning Map" of an airport means the map, prepared and certified by the Airports Authority indicating the areas around the airport in different colour coded grids with the permissible heights above mean sea level for the purpose of aerodrome safeguarding and a model Colour Coded Zoning Map of Navi Mumbai International Airport is given at Schedule IX;

(vii) "Designated officer" means the officer of Airports Authority of India responsible for processing and/or issuance of No Objection Certificate as specified in Appendix M of Schedule VIII;

(viii) "No Objection Certificate" means the certificate issued under rule 5;

(ix) "structure" includes building, mast, tower, chimney, poles, transmission lines, elevated roads or viaducts or bridges and elevated railway lines, wind farms and all other man-made structures;

(x) Words and expressions used but not defined in these rules shall have the meanings respectively assigned to them in the Act.

4. Restrictions on constructions, erections, trees, etc.— (1) No structure shall be constructed or erected, or any tree planted or grown on any land within a radius not exceeding twenty kilometers from the Aerodrome Reference Point of the civil and defence aerodromes, as specified in Schedule III to Schedule VII, without obtaining a No Objection Certificate for the height clearance, except in cases specified in sub-rule (2) of rule 7.

(2) No structure shall be constructed or erected, or any tree planted or grown on any land within the areas specified in Schedule I of the civil and defence aerodromes, as listed in Schedule III to Schedule VII, except for essential navigational aids and other installations required for aeronautical purposes.

(3) No structure higher than the height specified in Schedule II, shall be constructed or erected and no tree, which is likely to grow or ordinarily grows higher than the height specified in the said Schedule shall be planted on any land within a radius of twenty kilometers from the Aerodrome Reference Point.

(4) The level roads and level railway lines within one kilometer of the airport boundary wall shall also be subject to issuance of the No Objection Certificate.

5. Issuance of No Objection Certificate.— (1) The No Objection Certificate in respect of civil aerodromes shall be issued by the designated officer on behalf of the Central Government in respect of civil aerodromes.

(2) The No Objection Certificate in respect of defence aerodromes shall be issued by the authorised officer in accordance with Schedule I and Schedule II, subject to such other conditions as the said authorised officer may deem fit.

(3) In case of State owned and private aerodromes, licensed by the Directorate General of Civil Aviation, the No Objection Certificate for the protection of obstacle limitation surfaces (OLS) at such airports shall be issued by the designated officer and the procedure in cases of State owned and private aerodromes, not licensed by the Directorate General of Civil Aviation, shall be regulated in the manner as specified in rule 13.

(4) The application for issuance of No Objection Certificate in respect of civil aerodromes, shall be made by the applicant to the designated officer through the No Objection Certificate Application System (NOCAS), accessible on the website of the Airports Authority at www.aai.aero.

6. Issuance of Colour Coded Zoning Map.— The Colour Coded Zoning Maps (CCZM) shall be issued by the Airports Authority based on the latitude & longitude of the area in respect of civil aerodromes which shall indicate through different colour coded grids, the permissible heights in the areas around the airport, falling within the radius not exceeding twenty kilometers from the Aerodrome Reference Point. The CCZM shall be available at AAI website www.aai.aero.

7. Approval for construction of buildings, structures, etc.— (1) After considering the No Objection Certificate issued by the designated officer or the authorised officer, the concerned Local, Municipal or Town Planning and Development Authorities shall approve the construction of buildings or structures not exceeding the Permissible Top Elevation. Local, Municipal or Town Planning and Development Authorities shall also consider the existing building regulations or bye-laws or any other law for the time being in force before approving the construction of buildings or structures.

(2) In cases of aerodromes where the Colour Coded Zoning Maps has been issued, the Local, Municipal or Town Planning and Development authorities shall, in accordance with the height specifications provided in such Colour Coded Zoning Maps, approve the construction of the structures, as per the existing building regulations or bye laws or any other law for the time being in force:

Provided that no such approval shall be given by the Local, Municipal or Town Planning and Development authorities for sites which lies in approach, take off and transitional areas of an airport or in any other area, marked in the Colour Coded Zoning Map for the compulsory obtaining of No Objection Certificate from the designated officer or authorised officer.

(3) The Local, Municipal or Town Planning and Development authorities shall certify on the sanction plan that the Floor Space Index or Floor Area Ratio and the related height of the building or structure is within the permissible elevation as indicated in the Colour Coded Zoning Map for the given site.

(4) The Local, Municipal or Town Planning and Development Authorities shall submit the details of structures approved under sub-rule (1) and sub-rule (2) to the concerned designated officer or the authorised officer within a period of thirty days from the date of such approval.

8. Clearances for siting towers of fixed wireless stations.— (1) The clearances in respect of siting towers of fixed wireless stations shall be issued by the Standing Advisory Committee on Radio Frequency Allocation (SACFA) of the Ministry of Communication & Information Technology, Government of India, taking into consideration the heights above mean sea level specified in the Colour Coded Zoning Map.

(2) The Standing Advisory Committee on Radio Frequency Allocation (SACFA) of the Ministry of Communication, Government of India, shall submit the details of siting towers of fixed wireless stations approved under sub-rule (1) to the concerned designated officer or the authorised officer within a period of thirty days from the date of such approval.

9. Processing of No Objection Certificate cases.— (1) Processing of NOC cases in respect of civil aerodromes shall be carried out at nine Airports Authority offices one each at Delhi, Kolkata, Mumbai, Chennai, Guwahati Hyderabad, Bengaluru, Ahmedabad and Nagpur airports.

(2) The designated officer available at the offices specified in sub-rule (1) shall be responsible for the processing of applications and issue of No Objection Certificate and/or issue authorization for issuance of NOC for height clearance by concerned designated officer with respect to the civil aerodromes.

(3) A Panel of Chartered Engineers and Surveyors may be assigned by the Airports Authority to carry out physical verification of details of Site Elevation and Coordinates as submitted by the applicant. The expenses of the same shall be borne by the applicant.

(4) The officer in-charge of the corporate office at the headquarters of the Airports Authority in New Delhi shall supervise the functioning of the regional and station level offices.

10. Duties of designated officer.— (1) The designated officers, specified in Appendix M of Schedule VIII, shall be responsible for issuance of No Objection Certificate in respect of civil aerodromes and shall co-ordinate with the respective Local, Municipal or Town Planning and Development authorities in granting approval for construction of buildings or structures.

(2) The designated officer shall forward the copy of NOCs issued by him under sub-rule (1) above to the concerned airport operator and respective Local, Municipal or Town Planning & Development authorities.

11. Appellate Committee.— (1) There shall be an Appellate Committee consisting of the following, namely:-

(a) Joint Secretary (Airports), Ministry of Civil Aviation, Government of India – Chairperson;

(b) Joint Director General of Civil Aviation (Aerodrome), Directorate General of Civil Aviation – Member;

(c) Member (Air Navigation Services), Airports Authority of India – Member; and

(d) One technical expert having knowledge in the field of communication or air traffic management – Member.

(2) If any person or Local, Municipal or Town Planning and Development authorities or any airport operator is aggrieved with the decision of the Designated officer, such person or entity may appeal to the Appellate Committee for redressal of his/their grievances with respect to the height permissible under these rules.

(3) The cases for reference to the Appellate Committee specified in sub-rule (2) shall be received and processed by the corporate office at the headquarters of the Airports Authority in New Delhi.

12. Responsibilities of local authorities and airport operators.— (1) For the effective verification, monitoring and controlling the obstructions around the airports, it shall be the responsibility of the Local, Municipal or Town Planning and Development authorities and the airport operator to ensure that the height of the structures and their locations are in accordance with the approved building plans and the No Objection Certificate issued by the concerned designated officer or the authorised officer.

(2) For the purposes of sub-rule (1), the Local, Municipal or Town Planning and Development authorities and the airport operator shall develop appropriate mechanism with necessary trained manpower and equipment so as to verify the height of the structures, site elevations and site location or coordinates in World Geodetic System 1984 (WGS84).

13. Procedure to be followed in case of State owned and private airports not licensed by Directorate General of Civil Aviation.— (1) In case of State owned or private aerodromes not licensed by the Directorate General of Civil Aviation, the concerned State Government shall be responsible for the protection of obstacle limitation surfaces at such airports:

Provided that the designated officer shall give guidance to the State Government on the protection of obstacle limitation surfaces, whenever such guidance is sought by the concerned State Government.

14. Development and up gradation of aerodromes.— (1) The approved master plan of the aerodromes shall be considered for drawing and protecting the various obstacle limitation surfaces to ensure its development and future expansion or up-gradation.

(2) The designated officer or the authorised officer, before issuing the No Objection Certificate in respect of development or upgradation of any aerodrome (including its runway dimension), shall take into consideration the proposed communication, navigation and surveillance (CNS) facilities and the procedure for Air Navigation Service Operations (PANS-OPS) for height clearance at a given airport.

(3) Necessary consultation with the concerned stakeholders shall be carried out by the airport developer, airport operator or by the Air Navigation Service provider, as the case may be, at the time of development of master plan of a Greenfield airport or planning of major airport expansion or the installation of new communication, navigation and surveillance facilities at the existing airports.

(4) The aerodrome developer or operator and ANS provider, as the case may be, shall submit the approved master plan of the aerodrome and the proposed development or up gradation of any aerodrome (including

its runway dimensions, communication, navigation and surveillance (CNS) facilities and the procedure for Air Navigation Service Operations (PANS-OPS) to the concerned designated officer).

15. Procedure in case of violations.— The cases of violations where the height of any existing building, structure or tree on any land within the limits specified in rule 4 exceeds the height specified in Schedule I and Schedule II, or any other violation arising out of non-compliance of the provisions of these rules, shall be dealt in accordance with the provisions of the Aircraft (Demolition of Obstructions caused by Buildings and Trees etc.) Rules, 1994.

16. Savings.—Nothing in these rules shall affect the height clearances assessed and duly issued under the notifications issued by the Government of India in the Ministry of Civil Aviation *vide* notification numbers S.O. 84(E) dated the 14th January, 2010, and S.O 1589(E) dated the 30th June, 2008, during their assessment validity period of eight years for the buildings and twelve years for the structures such as masts, chimney and towers etc., within which the applicants have to complete the structures and obtain the completion certificate from the concerned authorities:

Provided that in cases where the construction work has not started during the initial validity period of five years for the buildings or within seven years for the structures such as mast, chimney, etc., revalidation shall not be considered and the height of such buildings or structures shall be reassessed in accordance with the provisions of these rules.

SCHEDULE - I

Purpose: Schedule- 1 indicates the No Construction Zones (NCZ) i.e. the areas around the Aeronautical Ground Aids (AGA) and Communication Navigation & Surveillance (CNS) facilities which need to be kept free from all obstructions for the safety and regularity of aircraft operations.

1. **Runway**

1.1. **Runway Strip:** The Land area specified below shall be completely free from all obstacles as provided hereunder (Refer Appendix-1 of Schedule - I):-

1.1.1. The land comprising within the Runway strip of uniform width of 150 meters on either side of centerline which extends to 60 meters beyond each extremity of Runway, along the extended centerline of a Runway of code 3 or code 4, equipped with Instrument Approach Procedure.

1.1.2. The land comprising within the Runway strip of uniform width of 75 meters on either side of centerline which extends to 60 meters beyond each extremity of Runway, along extended centerline of the Runway of code 1or 2, equipped with Instrument Approach Procedure and for non-Instrument runway of code 3 or 4.

1.1.3. The land comprising within the Runway strip of uniform width of 40 meters on either side of centerline which extends to 60 meters beyond each extremity of Runway ,along extended centerline of the non-Instrument Runway of code 2.

1.1.4. The land comprising within the Runway strip of uniform width of 30 meters on either side of centerline which extends to 30 meters beyond each extremity of Runway, along extended centerline of the non-instrument runway of code 1.

1.2. Installation of Extra High Tension, High Tension lines shall not be permitted within 1500 metres of the Inner edge of the approach and take-off climb surface.

2. **Frangibility Requirement**:

2.1. Any equipment or installation required for air navigation purposes which must be located:

(a) On that portion of the runway strip within:

i) 75 meters of the Runway centerline where the Runway code is 3 or 4 or

ii) 45 meters of the Runway centerline where Runway code is 1 or 2; or

(b) on a runway end safety area, a taxiway strip or within the distances specified in CIVIL AVIATION REQUIREMENTS SECTION-4, SERIES 'B', PART I Aerodrome Design and Operations or

(c) on a clearway and which would endanger an aircraft in the air,

shall be frangible and mounted as low as possible.

2.2 Any equipment or installation required for air navigation purposes which must be located on or near a strip of precision approach Runway ILS category I, II or III and which-

(a) is situated on that portion of the runway strip within 77.5 meters of the Runway centerline where the code number is 4 and code letter is F; or

(b) is situated within 240 meters from the end of the runway strip and within-

(i) 60 meters of the extended runway centerline where Runway code is 3 or 4

(ii) 45 meters of the extended Runway centerline where Runway code is 1 or 2; or

(iii) penetrates the inner approach surface, the inner transitional surface or the balked landing surface,

shall be frangible and mounted as low as possible.

3. Communication, Navigation and Surveillance (CNS) Facilities

3.1. **Very High Frequency Omni Range (VOR)/collocated Distance measuring Equipment (DME) and Very High Frequency Direction Finder (VHF DF)**: A land area within the 300 meters radius of the facility.

3.2. **Localizer or LLZ** (a component of ILS, providing azimuth guidance): the land area bounded by the following namely (Refer diagram at Appendix-L of Schedule VIII) :-

3.2.1. A line 300 meters in the direction of approach or nearest end of the runway, whichever is greater from localizer antenna and perpendicular to the runway.

3.2.2. A line 60 meters from the centerline of localizer antenna on both side and parallel to the runway.

3.2.3. A line containing centre of localizer antennas and perpendicular to the runway; and

3.2.4. Area within circle of 75 meters radius with centre at middle of the antenna system;

3.3. **Glide Path** (a component of ILS providing vertical guidance): the area bounded by the following, namely (Refer diagram at Appendix-K of Schedule VIII):-

3.3.1. A line 300 meters in the direction of approach from the glide path facility;

3.3.2. A line containing glide path antenna and perpendicular of runway;

3.3.3. Near edge of the runway from the glide path;

3.3.4. A line 30 meters in the directions away from the runway and parallel to it.

3.4. **Locators or Markers Beacons**: The land within a radius of 30 meters of the site of markers and locator beacons.

3.5. **Airport Surveillance Radar (ASR)**: No structure will be permitted on the land above the level of 3 meters below the pedestal height up to the distance of 500 meters from Radar antenna.

3.6. **Air Routes Surveillance Radar** (ARSR): No structure will be permitted on the land above the level of 5 meters below the pedestal height up to the distance of 200 meters from Radar antenna.

3.7. **Monopulse Secondary Surveillance Radar/ Secondary Surveillance Radar** (MSSR/SSR): The distance and the height restriction shall be the same as in respect of the Airport Surveillance Radar or Air Routes Surveillance Radar, depending upon operational usage.

3.8. **Microwave Link**: On corridor of 30 meters on either side of the direct line of azimuth and 10 meters below from the direct line of sight in the vertical plane;

3.9. **Ultra High Frequency (UHF) Link:** On a corridor of 30 meters on either side of the direct line of the azimuth and 10 meters below from the direct line of sight in the vertical plane.

3.10. **En-route Beacons**: Land within a radius of 30 meters around the antenna.

3.11. **Remote Receiver:** Land within a radius of 1525 meters of the site.

3.12. **Stand-alone Distance Measuring Equipment / Automatic Dependence Surveillance – Broadcast (DME/ADS-B)**: No structure will be permitted on land above the level of 3 meters below the antenna base upto a distance of 150 meters from the antenna.

3.13. **Airport Surface Detection Equipment (ASDE) or Surface Movement Radar (SMR):** No structure will be permitted on the land above the level of 2 meters below the antenna base up to the distance of 200 meters from Radar antenna.

3.14. **Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Reference Transmitter:** No structure will be permitted on the land above the level of 5 meters below the antenna base up to the distance of 200 meters from Radar antenna.

3.15. **A-SMGCS Multi-Lateration (MLAT)**: No structure will be permitted on the land above the level of 2 meters below the antenna base up to the distance of 200 meters from Radar antenna.

3.16. **Ground Based Augmentation System (GBAS) Reference Receiver**: No structure will be permitted on land up to the distance of 100 meters from antenna.

3.17. **Ground Based Augmentation System VHF Data Broadcast (GBAS VDB) station**: No structure will be permitted on the land up to the distance of 300 meters from antenna

3.18. **GBAS VDB monitoring station**: No structure will be permitted on the land up to the distance of 300 meters from antenna.

3.19. **Global Position System (GPS) Pseudolite Restriction:** No GPS Pseudolite shall be used within the approach funnel of any runway or within the airport where GNSS/GBAS based operation has been planned/exist.

3.20. **Global Navigation Satellite System (GNSS) repeater restriction**: No GNSS repeater shall be installed/use in approach funnel and within the 500 meter from the basic strip where GNSS/GBAS based operation has been planned/exist.

4. Definitions and Explanation.-

Some of the definitions of the terms used in the notifications have been provided below. For other terms, the CIVIL AVIATION REQUIREMENTS SECTION-4, SERIES 'B', PART I Aerodrome Design and Operations, ICAO annex 14, Annex 10 and Doc.8168 may be referred.

i) **Runway**: A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.

ii) ***Runway end safety area (RESA).*** An area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway.

iii) **"Runway Strip"** A defined area including the runway and stopway, if provided, intended:

a) to reduce the risk of damage to aircraft running off a runway; and

b) to protect aircraft flying over it during take-off or landing operations.

iv) **"Runway Code",** means the Runway Code number specified in column (1), in relation to the Runway length specified in column (2), of the Table below:-

Table 1.1 DIMENSION OF RUNWAY STRIP

RUNWAY		INSTRUMENT RUNWAY		NON-INSTRUMENT RUNWAY	
Runway Code	Aerodrome Reference Field Length (ARFL) in (Meter)	Width Extending laterally on either side of Runway Centre Line (Meter)	Length beyond Runway End/Stop way (Meter)	Width Extending laterally on either side of Runway Centre Line (Meter)	Length beyond Runway End/Stop way (Meter)
(1)	(2)	(3)	(4)	(5)	(6)
1.	<800	75	60	30	30
2.	800<1200	75	60	40	60
3.	1200<1800	150	60	75	60
4.	1800 & above	150	60	75	60

v) "**Approach funnel**" in relation to (Refer Appendix-1 of Schedule -I):-

(a) **Instrument Runway Code 3 and 4**, means the area in the shape of an isosceles trapezium having the longer parallel side 4800 meters long (2400 meters on either side of the extended centerline of the runway) and smaller parallel side 300 meters long (150 meters on either side of the extended centerline of the runway), where the smaller and longer parallel sides are placed at a distance of 60 meters and 15060 meters respectively, from the end of the runway and at right angles to the extended centerline;

(b) **Instrument Runway (Precision) Code 1 and 2**, means the area in the shape of an isosceles trapezium having the longer parallel side 4650 meters long (2325 meters on either side of the extended centerline of the runway) and smaller parallel side 150 meters long (75 meters on either side of extended centreline of the runway) where the smaller and longer parallel sides are placed at a distance of 60 meters and 15060 meters respectively, from the end of the runway and at right angles to the extended centerline;

(c) **Instrument Runway (Non Precision) Code 1 and 2**, means the area in the shape of an isosceles trapezium having the longer parallel side 900 meters long (450 meters on either side of the extended centerline of the runway) and smaller parallel side 150 meters long (75 meters on either side of the extended centerline of the runway), where the smaller and longer parallel sides are placed at a distance of 60 meters and 2560 meters respectively, from the end of the runway and at right angles to the extended centerline;

(d) **Non-Instrument Runway Code 3 and 4**, means the area in the shape of an isosceles trapezium having the longer parallel side 750 meters long (375 meters on either side of the extended centerline of the runway) and smaller parallel side 150 meters long (75 meters on either side of the extended centerline of the runway), where the smaller and longer parallel sides are placed at a distance of 60 meters and 3060 meters respectively, from the end of the runway and at right angles to the extended centerline;

(e) **Non-Instrument Runway Code 2**, means the area in the shape of an isosceles trapezium having the longer parallel side 580 meters long (290 meters on either side of the extended centerline of the runway) and smaller parallel side 80 meters (40 meters on either side of extended centreline of the runway) where the smaller and longer parallel sides are placed at a distance of 60 meters and 2560 meters respectively, from the end of the runway and at right angles to the extended centerline;

(f) **Non- Instrument Runway Code 1** means the area in the shape of an isosceles trapezium having longer parallel side of 380 meters long (190 meters on either side of the extended centreline of the runway) and smaller parallel side 60 meters (30 meters on either side of extended centreline of the runway) where the smaller and longer parallel sides are placed at a distance of 30 meters and 1630 meters respectively from the end of the runway and at right angles to the extended centreline. The diagrams of runway strip and approach funnel of instrument runway code 1,2,3 and 4 and non–instrument runway code 3 and 4 have been shown in the Appendix-1 of Schedule-I ;

vi) **"Instrument Runway"** means a runway served by visual aids and non-visual aids providing directional guidance adequate for a straight in approach and intended for the operation of aircraft using instrument approach procedures;

vii) **Non-Precision Approach Runway**- means an instrument runway served by visual aids and a non-visual aid providing at least directional guidance adequate for a straight-in approach;

viii) **Precision approach runway, category I** – An instrument runway served by Instrument Landing System and/or MLS and visual aids intended for operations with a decision height not lower than 60 meters and either a visibility not less than 800 meters or a runway visual range not less than 550 meters.

ix) **Precision Approach Runway, category II**- An instrument runway served by Instrument Landing System and or MLS and visual aids intended for operations with a decision height not lower than 60 meters but not lower than 30 meters and a runway visual range not less than 350 meters.

x) **Precision Approach Runway, Category III**- An instrument runway served by Instrument Landing System (ILS) and/or MLS to and along with surface of the runway and –

(a) **ILS CAT IIIA**- intended for operations with a decision height lower than 30 meters, or no decision height and a runway visual range not less than 200 meters.

(b) **ILS CAT III**B- intended for operations with a decision height lower than 15 meters, or no decision height and a runway visual range less than 200 meters but not less than 50 meters.

(c) **ILS CAT III**C- intended for operations with no decision height and no runway visual range limitations.

xi) **"Non-Instrument Runway"** means a runway intended for operations of the aircraft using visual approach procedure.

xii) **"Very High Frequency Omni Range, Terminal Very High Frequency Omni Range, And Doppler Very High Frequency Omni Range**" means the facilities operating in the Very High Frequency band of frequencies 112 to 118 MHz, radiate signals whereby an aircraft with the help of an instrument in its cockpit when tuned to the ground equipment frequency automatically gets its direction with respect to the facility and helps an aircraft to navigate on a predetermined course or home to an airport served by the facility.

xiii) **"Instrument Landing System (ILS)**" means the facility which serves to help an aircraft to make a safe landing on the runway in conditions of poor visibility and comprises of the following component facilities, namely:-

(a) **Localizer** facility which radiates Very High Frequency Signals which when picked up by an aircraft guide it onto the centerline of the runway in the horizontal plane and is normally situated about 305 meters from the runway end;

(b) **Glide Path** facility radiates Ultra High Frequency signals and is normally situated about 275 meters to 305 meters from the runway threshold and offset about 122 meters to 137 meters from the centerline of the runway and provides the glide angle information to a landing aircraft with the help of an instrument in the cockpit which when tuned to the glide path frequency indicates whether the aircraft is flying up or down or along the correct glide angle;

(c) **Outer Marker or Outer Locator** facility operating on 75 MHz in the Very High Frequency band is normally installed along the extended centerline of the runway at a distance between 3.5 and 6 nautical miles (1 nautical mile=1853 meters) and produces radiation pattern to indicate the landing aircraft, the pre-determined distance from the threshold along the Instrument Landing System glide path;

xiv) "**Radar**" includes-

(a) **Airport Surveillance Radar (ASR)** which is a radar facility serving an aerodrome to scan the air traffic within 50 to 60 nautical miles of the aerodrome;

(b) **Air Routes Surveillance Radar (ARSR)** or Secondary Surveillance Radar is a high power long-range radar covering a distance of 200 nautical miles approximately and it scans air traffic to a larger distance than Airport Surveillance Radar;

xv) **Communication and Navigational** facilities include-

(a) Microwave Link which is a radio facility whereby mostly intelligence/data is carried to the Air Traffic Control Display site;

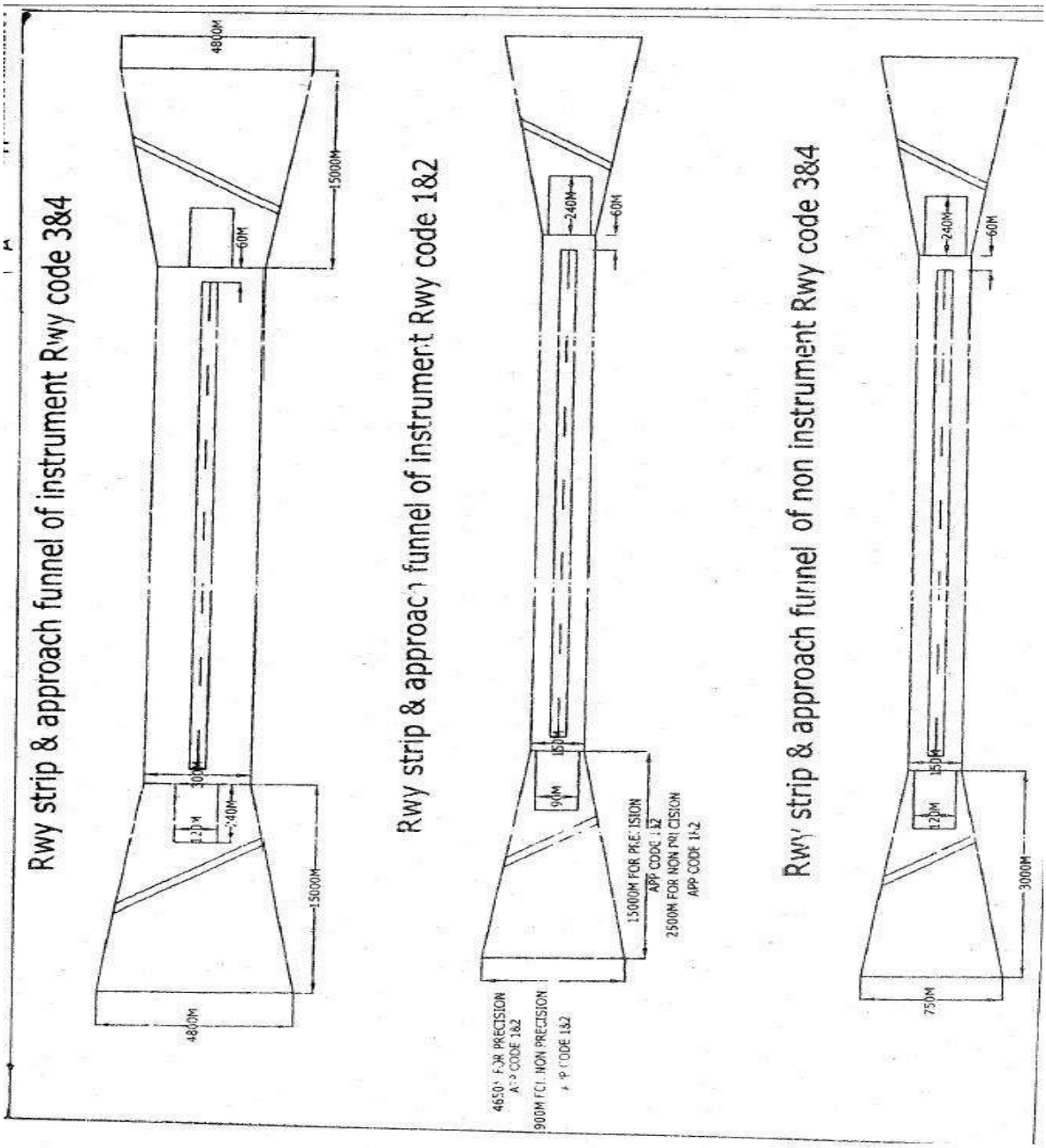
(b) Ultra High Frequency Link which is a radio relay facility operating in Ultra High Frequency Band;

(c) Beacons which are radio transmitters operating in the Medium Frequency band from 200 to 400 KHz radiating omni directionally in the horizontal plane and an aircraft equipped with a suitable cockpit instrument can get its location automatically with respect to this facility.

(d) Remote Receivers which are radio receiving stations (HF Band) installed at remote site away from factory or industrial areas to avoid interference link man-made static, etc.

Note: Location of Navigational Aids shall be determined as per the provisions of Annex-10 of International Civil Aviation Organization.

Appendix-1 to Schedule -I



SCHEDULE-II

Purpose:

The height or permissible elevation for the structure, requiring grant of NOC, shall be calculated based upon the International Civil Aviation Organization (ICAO) Annex 14 Obstacle Restriction and Removal, Annex 10 the Radio Communication, Navigation and Surveillance (CNS) aids and Doc 8168, Vol II defining the operational requirements for minimum altitudes of various segments of published or proposed instrument approach procedures.

This annexure–II defines various OLS surfaces, requirements w.r.t. CNS and PAN-OPS, procedure to be followed while applying and processing the NOC for height clearance.

1. **Obstacle Limitation Surfaces (based on ICAO Annex 14 and DGCA India Civil Aviation Requirements (CARs) on Aerodrome Design and Operations) are as under:**

1.1 **Take-off climb surface**-The dimensions of the take-off climb surface shall not be less than the dimensions specified in the table given below except that if a runway is meant for takeoff, a lesser length may be adopted for the takeoff climb surface where such lesser length would be consistent with procedural measures adopted to govern the outward flight of aeroplanes.

Table 2.1 -Dimensions and Slopes of Obstacle Limitation Surfaces

(Runways Meant for Take-Off)

Surface and dimension *	Code Number		
	1	2	3 or 4
(1)	(2)	(3)	(4)
TAKE OFF CLIMB			
Length of inner edge	60 meters	80 meters	180 meters
Distance from runway end	30 meters	60 meters	60 meters
Divergence (each side)	10%	10%	12.5%
Final width	380 meters	580 meters	1200 meters 1800 meters**
Length	1600 meters	2500 meters	15000 meters
Slope	5%	4%	2%

* All dimensions are measured horizontally.

**When the intended track includes changes of heading greater than 15 degree for operations conducted in IMC, VMC by night.

1.2 Transitional Surface

1.2.1 The outer limit of the transitional surface is determined by its intersection with the plane containing inner horizontal surface and the slopes of transitional surfaces are as given below, namely:-

(i)	Precision Approach Runway	14.3% (1:7)
(ii)	Non Precision Runway	14.3% (1:7) for code 3 & 4
		20% (1:5) for code 1 & 2
(iii)	Non-Instrument Runway	14.3% (1:7) for code 3 & 4
		20% (1:5) for code 1 & 2;

The slope of the transitional surface shall be measured in a vertical plane at right angles to the centre line of the runway;

1.2.2 The elevation of a point on a lower edge shall be –

(a) along the side of approach surface, equal to the elevation of approach surface at that point; and

(b) along the strip, equal to the elevation of nearest point on the centre line of the Runway or its extension;

1.3 Approach Surface

1.3.1 The approach surface shall be established for each runway strip in the direction of intended landing of the aeroplanes and the limits and slopes are given table below:

1.3.1.1 Instrument Runway

Inner Edge of Approach Surface:

Length of Inner edge - 150 meters for Code No. 1 and 2

- 300 meters for Code No. 3 and 4

Distance from runway threshold - 60 meters

Divergence -15% on either side

Length & Slope of Approach Surface: as given in table 2.2

Table 2.2 -Approach Surface Slope of Instrument Runway

Runway		Precision Approach Runway		Non Precision Approach Runway		
Code No.	Aerodrome Reference Field Length (meter)	First Section Length & (Meter) Slope	Second Section Length (Meter) & Slope	First Section Length (Meter) & Slope	Second Section Length (Meter)& Slope	Horizontal Section (Meter)
1.	<800	3000 2.5%	**12000**** **3%**	2500 3.33%	- -	- -
2.	800<1200	3000 2.5%	**12000**** **3.00%**	2500 3.33%	- -	- -
3.	1200<1800	3000 2%	3600 2.5%	3000 2%	3600 2.5%	**8400***
4.	1800 and Above	3000 2%	3600 2.5%	3000 2%	3600 2.5%	**8400***

* Total length of approach surface for runway code number 3 and 4 with precision and non-precision shall be 15000 meters.

** Total length of approach surface for Precision approach Runway Code number 1 and 2 shall be 15000 meters.

1.3.1.2 **Non-Instrument runway**

Inner Edge of Approach Surface:

Length of Inner edge - 60 meters for Code No. 1

- 80 meters for code No. 2

- 150 meters for Code No. 3 and 4

Distance from runway threshold - 30 meters for code 1

- 60 meters for code No. 2, 3 and 4

Divergence -10% on either side

Length & Slope of Approach Surface: as given in table 2.3

Table 2.3 -Approach Surface Slope of Non-Instrument Runway

Runway		Length and slope of approach surface	
Code No.	Aerodrome Reference Field Length (meter)	Length (Meter)	Section Slope
1.	<800	1600	5%
2.	800<1200	2500	4%
3.	1200<1800	3000	3.33%
4.	1800 & above	3000	2.5%

1.3.1.3 Aerodrome where there are more than one runway with over-lapping approach areas and associated surface, most stringent of the two would be the applicable criteria.

1.3.1.4 For determining the approach, the physical extremities of the runway shall only be considered. In case of displaced threshold the permissible height shall be calculated based on approach surface and transitional surface with respect to the runway extremity or displaced threshold whichever is more restrictive**.**

1.3.1.5 At Aerodromes, where the proposals for runway extension exist, the requisite surface shall be determined from the proposed extension as well as from the existing runway strip/associated clearway, as applicable and the lower of the two elevations shall be permitted. The elevation of the associated runway extremity/displaced threshold/proposed extension of runway shall be the datum for approach surface.

1.3.1.6 The slope of the approach surface shall be measured in a vertical plane containing the centerline of the runway.

1.4 Inner Horizontal Surface (IHS)

1.4.1 Dimensions and permissible heights of Inner Horizontal Surface are given in the table below:

Table 2.4 -Dimensions and Permissible Heights of Inner Horizontal Surface

Runway		Instrument		Non-Instrument	
Code No.	Aerodrome Reference Field Length (meter)	Radius (Meter)	Height (Meter)	Radius (Meter)	Height above Aerodrome Elevation (Meter)
1.	<800	3500*	45	2000*	45
2.	800<1200	3500*	45	2000*	45
3.	1200<1800	4000**	45	4000**	45
4.	1800 and Above	4000**	45	4000**	45

*For runway code number 1 and 2, radius of IHS shall be measured from the Aerodrome Reference Point (ARP).

** For runway code number 3 and 4, radius of IHS shall be measured from the runway extremity.

1.4.1.1 The reference datum for Inner-Horizontal Surface shall be the aerodrome elevation as defined in clause (g) of the Explanation to this notification.

1.4.1.2 For Runway code 3 and 4, the Inner Horizontal Surface shall be a composite pattern, which consists of two circular areas centered at the two ends with a radius of 4000 meters. These areas shall be joined tangentially to form an elliptical shape as shown in Appendix-A of Schedule VIII.

1.4.1.3 Where it is required to protect two or more widely spaced long runways, a more complex pattern involving four or more circular areas are formed. These areas should be joined tangentially by straight lines and the Inner Horizontal Surface shall be defined by the external limits of the resulting pattern (Refer Appendix -A of Schedule VIII).

1.4.1.4 When two aerodromes are close to each other with overlapping circuits the Inner Horizontal Surface will be drawn as prescribed in para 1.4.1.3. The inner horizontal surface of these two aerodromes shall be joined tangentially to form one common Inner Horizontal Surface.

1.4.1.5 In case of common horizontal surface serving two aerodromes, the elevation of the Inner Horizontal Surface will be referenced to the lower of the two aerodromes.

1.5 Conical Surface

1.5.1 The conical surface shall be projected upwards and outwards from the periphery of the Inner Horizontal Surface. The slope 5% (1:20) of the conical surface shall be measured in a vertical plane perpendicular to the Inner Horizontal Surface. The reference datum for Conical Surface shall be the aerodrome elevations (Refer to Appendix -B of Schedule VIII for illustration of the various surfaces including the conical surface).

Note: Where a part of Inner Horizontal Surface and conical surface lies below the approach/take-off climb surface, the permissible heights shall be the lowest of the applicable surfaces.

1.6 Outer Horizontal Surface (OHS)

1.6.1 The Outer Horizontal Surface shall extend to 15000 meters from the Aerodrome Reference Point for Aerodrome with runway code 3 and 4.

1.6.2 In case of Aerodrome with runway Code 2, the Outer Horizontal Surface shall extend to 14740 meters from Aerodrome Reference Point for Instrument runways and 13740 meters for Non-Instrument runways.

1.6.3 Where combined Outer Horizontal Surface is established for two Aerodromes, the Outer Horizontal Surface shall be centered on the Aerodrome Reference Point of the Aerodrome of higher category.

1.6.4 Outer Horizontal Surface for Aerodrome with runway code No.1 shall not be established.

1.6.5 The Outer Horizontal Surface, would be defined such that the Conical Surface may continue to be extended at 5% slope to a point wherein the permissible maximum height of *300 meters (above aerodrome elevation) is reached and thereafter this surface is maintained upto 15 kilometers from Aerodrome Reference Point. Construction(s) protruding above these surfaces shall normally not be permitted. Obstructions existing in the area should be marked or lighted.

***Note: In case of Defence Aerodromes, the permissible maximum height in conical and OHS shall be 150 meters above aerodrome elevation.**

1.6.6 In order to avoid abrupt vertical changes in surfaces, the surfaces beyond the conical surfaces will slope laterally at 1:7 from edges of the approach and take off surfaces between the permissible heights of 150 meters to 300 meters (For illustration refer to Appendix -B of Schedule VIII).

1.6.7 The datum for Outer Horizontal Surface shall be the aerodrome elevation.

1.7 The Inner Approach, Inner Transitional and Balked Landing Surfaces (collectively referred as Obstacle Free Zone or OFZ):

1.7.1 **Obstacles Free Zone** shall be established for a runway equipped with precision approach (ILS) category I, II and III operations. The zone shall be kept free from fixed objects other air navigation aids, which must be near the runway, to perform their function, mounted on light weight frangible fixtures.

Note: Obstacles Free Zone for runway code No. 1 and 2 are not established.

The dimensions and slopes of the Obstacles free zone (Code 3 and 4) are given below.

1.7.1.1 The inner approach surface

Width	120 meters
Distance from Threshold	60 meters
Length	900 meters
Slope	2%

1.7.1.2 The inner transitional surface

Slope	33.3%

1.7.1.3 Balked Landing Surface

Length of the Inner edge	120 meters
Distance from Threshold	1800 meters
Divergence	10%
Slope	3.33 %

2 **Protection of Service volume of various Communication, Navigation and Surveillance Facilities** (based on ICAO Annex 10 Navigational Aids)

2.1 **Very High Frequency Omni Range (VOR), Terminal Very High Frequency Omni Range (TVOR), and collocated Very High Frequency Omni Range Distance Measuring Equipment (VOR DME)** - No structure (located beyond the area of 300M radius as specified in Annexure I) shall subtend a vertical angle greater than 1.5 degree at the centre of the Very High Frequency Omni Range counterpoise from the horizontal plane passing through the counterpoise.

2.2 **Stand-alone Distance Measuring Equipment (DME)** - No steel towers, power lines, metal buildings (located beyond the area of 150M radius as specified in Annexure I) shall protrude elevation angle of 3 degree measured from the base of Distance Measuring Equipment antenna.

2.3 **Localizer**

2.3.1 Within $\pm$ 10 degrees azimuth in front of LLZ antenna, an object (located beyond the area specified in Annexure I) should not subtend an angle of elevation more than 0.75 degrees at the centre of antenna array.

2.3.2 Within $\pm$ 10 degrees to $\pm$ 35 degrees LLZ azimuth in front of antenna an object (located beyond the area specified in Annexure I) should not subtend an angle of elevation more than 1.1 degree.

2.3.3 Notwithstanding any thing in para 2.3.1 and 2.3.2, in all airports having/intended to have cat II and cat III ILS, all object in sector of $\pm$ 18 degree for medium aperture antenna localizer and $\pm$ 15 degree for wide aperture LLZ antenna, upto the distance of 1050M beyond threshold, to be analysed for their potential multipath effects on the performance of ILS.

2.4 **Glide Path**

Beyond areas specified in Annexure I and within $\pm$ 8 degrees azimuth in front of the glide path antenna (in the direction of approach), a building/structure should not subtend an angle of elevation of more than 1.1 degree at antenna base.

2.5 **Airport Surveillance Radar (ASR);**

2.5.1 **Wherever airport is served or proposed to be served by a single ASR, following criteria shall be applicable:**

2.5.1.1 Beyond 500 meters from particular Radar site, the height of the permissible structures may be increased at the rate of 0.05 per meter, upto a point wherein the height of the permissible structure does not protrude above the line drawn from a point 10% below the minimum sector altitude at the farthest point (from Radar site) or any other designated MSA at different distance in same sector whichever is closer to horizon, to the centre of antenna pedestal, considering the Minimum Sector Altitude (MSA) in that particular sector. Beyond the above stated point no large object would be permitted to protrude above the line drawn from a point 10% below the minimum sector altitude at the farthest point (from Radar site) or any other designated MSA at different distance in same sector whichever is closer to horizon to the centre of antenna pedestal depending on the minimum Sector Altitude in that particular sector (For illustration refer to Appendix -C of Schedule VIII).

Note: Large object means the structure/s in isolation or collectively subtending azimuth angle of 0.4 degree or above at Radar antenna. In case of cluster of buildings wherein the gap between the two adjacent buildings sub tends an azimuth angle of less than 0.4 degree on the antenna pedestal, the entire cluster should be considered as one object.

2.5.2 **Wherever airport is served or proposed to be served by Multiple Radars (more than one ASR), operational and integrated, following criteria shall be applicable:**

2.5.2.1 In case only one ASR is installed and the proposed ASRs are yet to be operationalized and integrated, the existing ASR will be considered for height calculations as per the provisions of 2.5.1.

2.5.2.2 After multi radar system is operationalized and integrated, the maximum height permissible in the integrated system will be considered for calculation of height to the applicant. However, from the radar performance requirement point of view, the structures are to be examined, as follows, to ensure that there is no degradation of radar performance.

I. Within one kilometer of any ASR in the system, structures shall be examined from the respective radar as per para 2.5.1.

II. Between one and two kilometer, the metallic and large structures shall be examined from respective ASR as per para 2.5.1.

III. Structures which are Non -metallic and are not termed as large objects may be permitted to higher height as per IV below, subject to condition that other structure(s) in vicinity do not form cluster with the structure under examination.

IV. Objects beyond two kilometer from any one of the ASRs, highest permissible height among integrated & operational ASR sites shall be permitted as per para 2.5.1

Note: Above criterion will not be applicable for wind farms, high tension lines and electromagnetic source of interference.

2.6 **Air Route Surveillance Radar (ARSR)**

Beyond 200 meters from particular Radar site the height of the permissible structures may be increased at the rate of 0.05 meter per meter, upto a point wherein the height of the permissible structure does not protrude above an angle of elevation of more than 0.5 degree at the antenna pedestal or an angle equal to antenna tilt angle set during last flight inspection whoever is higher. Beyond the above stated point no large object would be permitted to protrude above the line drawn at an angle of 0.5 degree from antenna pedestal or an angle equal to antenna tilt angle set during last flight inspection whichever is higher. Large object means the structure subtending azimuth angle of 0.4 degree or above at Radar antenna. In case of cluster of buildings wherein the gap between the two adjacent buildings sub tends an azimuth angle of less than 0.4 degree on the antenna pedestal, the entire cluster should be considered as one object (For illustration refer to Appendix -D of Schedule VIII).

2.6.1 **Monopulse Secondary Surveillance Radar / Secondary Surveillance Radar (MSSR/SSR)**

Same as Air Surveillance Radar/Air Route Surveillance Radar depending on operational usage.

2.7 **Automatic Dependence Surveillance –Broadcast (ADS-B)**

Beyond 150m from particular ADS-B site, the height of the permissible structures does not protrude above the line drawn from a point 10% below the minimum sector altitude at the farthest point (from ADS-B site) or any other designated MSA at different distance in same sector whichever is closer to horizon, to the centre of the antenna pedestal of ADS-B.

2.8 **Advance Surface Movement Guidance and Control System (A-SMGCS):**

No structure should be built on the relevant area of the airport surface which blocks the line of sight between any of the sensors of the Advance Surface Movement Guidance and Control System and the relevant operational area. In case there is an operational or safety/security requirement to add a structure on the airport surface which may obstruct the line of sight between Surface Movement Radar (SMR) antenna//sensors, AAI would augment the system to meet the Advance Surface Movement Guidance and control system operational requirement.

2.8.1 **Surface Movement Radar (SMR)**

Beyond the distance of 200 M. from SMR antenna, no object should protrude the line of sight to nearest point of designated coverage volume of said SMR.

2.8.2 Beyond the distance of 200 M from A-SMGCS Ref TX no object should protrude the line of site to nearest point of designated coverage volume of said ref TX and corridor between ref TX and MLAT of 5 Mx5 M.

2.8.3 Beyond the distance of 200 M from A-SMGCS MLAT no object should protrude the line of designated coverage volume of said ref TX and a corridor between ref TX and MLAT of 5 Mx5 M.

2.9 **Indian Land Uplink Station (INLUS)/Indian National Reference Station (INRES) of GPS Aided Geo Augmented Navigation (GAGAN) System**

No structure will be permitted to protrude the above the plane inclined at elevation angle of 2 degree form the horizontal surface drawn at the level of antenna of Indian Land Uplink Station and Indian National Reference Station of GPS Aided Geo Augmented Navigation system which is a part of Global Navigation Satellite System (GNSS).

2.10 **Very High Frequency (VHF)/ Remote Controlled Air to Ground communication (RCAG)** – no structure shall be allowed to protrude above the lowest line of sight of coverage of designated service volume of facility without proper mitigation.

2.11 **Wind Turbine Generators/ Wind Farms**- No Wind Turbine Generator/s shall be installed upto a distance of 10 KM in line of sight of the Radar Antenna of all Static Air Defence Radars and upto 8 KM from VOR and Airport Surveillance Radar (ASR).

2.12 **Electricity Power Transmission Lines**

2.12.1 No High Tension (HT) or Low Tension (LT) line shall be permitted to pass through the sensitive area of Localizer and glide path.

2.12.2 All HT lines will not be permitted to the following area until and unless these are shielded by permanent structures:-

a. Localizer, with in ±18 degree, all HT lines will be permitted only up to an angle of elevation of 0.5 degree from the localizer. If these HT line are on the radial, these may be permitted to 0.75 degree elevation. In the sector between ± 18 degree to ± 35 degree line may be permitted up to the elevation angle of 0.75 degree.

b. Glide Path, all HT lines will be permitted only up to an angle of elevation of 0.5 degree from the Glide Path. If the HT line is on the radial, it may be permitted to 0.75 degree elevation.

c. VOR, HT lines shall be permitted below 0.5 degree at counterpoise and if these lines are on the radial, they may be permitted up to 1 degree.

d. RADAR, power line above 11 KVA and up to 100 KVA may not be permitted up to 1 km and above 100 KVA up to 2 KM

3. Procedure for Air Navigation Services Operation (PANS-OPS) criteria (based on ICAO Document 8168, Volume II):

3.1 In order to achieve the lowest possible operating minima for aircraft operation, it is necessary to protect not only the Annex 14 OLS but also to safeguard the PANS-OPS [ICAO Document 8168] Surfaces. The limit of PANS-OPS surfaces extend up to 30NM from the facility i.e. VOR or NDB serving the aerodrome. Considerations need to be given to the objects which penetrate the PANS-OPS surfaces, regardless whether or not they penetrate Annex 14 OLS. Such obstacle may result in an operational penalty like higher Obstacle Clearance Altitude/Height (OCA/H) and introduction of longer approach segment. Therefore, while examining the cases for issue of NOC from the considerations of Annex 14 and Annex 10 criteria as provided in para 1 and 2 above, the operational criteria needs to be considered based on the provisions of Documents 8168, Vol.-II. It needs to be ensured that the minimum altitudes of the following segments, published or the proposed, are not infringed:

i. Minimum Sector Altitude (MSA)

ii. Minimum Holding Altitude (MHA)

iii. Minimum Vectoring Altitude (MVA)

iv. Minimum Altitude of Initial and Intermediate Segments

v. OCA/H (Straight-in-and Circling) for all aircraft categories

vi. STARs /SIDs procedure altitude.

vii. Basic ILS Surface

3.2 Criterion specified in Doc 8168 Vol. II (PANS-OPS) for designing instrument procedures shall not be used for creating new structures as PANS-OPS surfaces are not intended to replace Annex 14 OLS as planning surfaces for creating new structures."

3.3 For the obstacles located even outside the limits of Annex 14 OLS, it shall be ensured that PANS-OPS surfaces of the published instrument approach procedures are not penetrated.

Note 1: Instrument approach procedures of all the civil aerodromes in India have been published in the AIP India under the section "Aerodrome". In the published procedures, the minimum altitudes of the various segments of instrument approach procedures have been specified.

Note 2: The minimum obstacle clearance criteria are applied as per the provisions of International Civil Aviation Organization (ICAO) Document 8168 Volume II. Normally for minimum sector altitudes (Applicable upto 30 NM from the facility on which procedure is designed), minimum vectoring altitudes, minimum holding altitudes and for the initial approach an obstacle clearance of 1000 feet is applied.

Note 3: Final approach areas of Very High Frequency Omni Radio Range (VOR)/Non Directional Beacon (NDB) have been illustrated in Appendix -E of Schedule VIII).

4. Shielding criteria

The principle of shielding is applicable w.r.t. Natural Terrain, already penetrating one of the obstacle limitation surfaces of an airport and it is not likely to be removed. The shielding criteria as explained below is applicable w.r.t. AGA and CNS surfaces.

4.1 The principle of shielding will not to be applied in:

I. Transitional surface area,

II. Approach surface areas, within 4000 meters of the inner edge of approach surface.

III. Inner Horizontal Surface (IHS), within a distance of 2500 meters from the runway centre line. In case of multiple runways, area encompassed by 2500M from centerline of all runways.

4.2 The following criteria shall be followed for the purpose of applying shielding criteria for the proposed structure with respect to existing natural terrain.

4.2.1 Proposed (shielded) object located beyond a distance of 2500M from runway centerline:

(i) Draw a line joining the centre point of the plot to the nearest runway end (runway code no. 3 & 4) or ARP (code 1 & 2) as the case may be. Shielding will be applicable w.r.t. applicable terrain within the area bounded by the two lines drawn parallel to the above line, at a distance of 600M on either side. A line, across the highest point of applicable reference (shielding) terrain, perpendicularly to the above parallel lines shall be drawn to delineate the areas for different type of shielding i.e. negative or equal to the horizontal plane passing through top of reference terrain (For the illustrations refer to Appendix–F and Appendix-G of Schedule VIII).

(ii) If the proposed structure is lying between the aerodrome and the reference terrain, a negative shielding of 10% shall be applicable. The shielding benefit of a horizontal plane, equal to reference terrain height, shall be provided in the area located in the opposite side away from the aerodrome (For the illustrations refer to Appendix–F and Appendix-G of Schedule VIII).

4.3 Communication Navigation Surveillance (CNS) Parameters:

For CNS facilities, shielding benefit could be provided to the structures in cases wherein such structures (shielded) are in the shadow of the highest terrain of permanent nature. Shadow for this purpose is defined as an area falling below a line drawn from the top and both the extremities of the terrain of permanent nature, to the facility and extrapolation of the same plane behind from the said obstacle.

5. Conduct of Aeronautical Study and CNS Simulation Study

5.1 **The Aeronautical Study**, as referred to in the Civil Aviation Requirements Section-4, Series 'B', Part I on Aerodrome Design and Operations and ICAO Annex 14, may be conducted to determine that the existing object or the proposed new object would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes in pursuance of the ICAO provisions as given below:

Note 1: New objects or extensions of existing objects should not be permitted above the conical surface and the inner horizontal surface except when, in the opinion of the appropriate authority, after aeronautical study it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

Note 2: Existing objects above an approach surface, a transitional surface, the conical surface and inner horizontal surface should as far as practicable be removed except when, in the opinion of the appropriate authority, after aeronautical study it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

5.1.1 The request for aeronautical study shall be considered by the Member (Air Navigation Services), Airports Authority of India, on case to case basis.

5.1.2 Aeronautical Study shall not be carried out in Approach and Transition surfaces.

5.1.3 Aeronautical Study, as per the established guidelines, shall be carried out by AAI, ICAO or any other agency, approved for the purpose by Ministry of Civil Aviation.

5.1.4 Based on the Aeronautical Study report, including a revised height clearance if necessary, shall be communicated to the applicant by AAI.

5.1.5 Guidelines are available at NOCAS at www.aai.aero.

5.2 **Communication Navigation Surveillance (CNS) Simulation study:** In case any structure is required to be made within aerodrome premises (airside and city side) by the Aerodrome Operator which creates obstruction from CNS point of view, a simulation study could be carried out to study the impact of this structure on the performance of the relevant facility and in case the study confirms that the impact would not hamper the operability of the facility, such structure could be permitted within the aerodrome premises.

6. Procedure for determining the maximum permissible heights:

The following steps shall be taken for calculating the maximum permissible heights for cases where there is a requirement of NOC from AAI or from Defence Authorities.

6.1 ICAO **Annex 14 Obstacle Limitation Surfaces Criteria:**

6.1.1 The site of the proposed buildings/installations shall be marked on the zoning map of the aerodrome, prepared by the aerodrome operator, where Annex 14 surfaces have been drawn *or plotted on the map generated by NOCAS based on the site co-ordinate(s) in WGS 84 system.*

6.1.2 If the site location is within the approach/take off surface, the permissible applicable heights in the approach/take off climb surface, transitional surface, Inner Horizontal Surface/conical surface shall be calculated.

6.1.3 If the site is located outside the approach/take off climb surface, the height shall be determined as per the location applicable to the relevant surface (Transitional, Inner Horizontal Surface, Conical or Outer Horizontal Surface).

6.2 **ICAO Annex 10 Communication, Navigation and Surveillance (CNS) Criteria:**

6.2.1 Determine the distance of the proposed site from the each communication, navigational and surveillance facility separately and calculate the applicable heights based on the provisions as contained in para 2 of Annexure II.

6.3 The permissible height from the above two criteria shall be the lowest as of 6.1 and 6.2 above.

6.4 **Procedure for Air Navigation Service Operations (PAN-OPS) Criteria:**

6.4.1 After having determined the combined applicable elevation, based on the OLS criteria and CNS criteria, it shall further be ensured that the PANS-OPS surfaces are not infringed and the minimum altitudes of the published/proposed segments of instrument approach procedures are fully protected. This has also been referred to at para 3 of this annexure.

6.4.2 The lowest elevation determined as above, based on the OLS, CNS and PANS-OPS criteria, shall be the permissible top elevation of the proposed structure for which No Objection Certificate may be issued by the designated officer of AAI or the Defence Authorities.

6.5 No Objection Certificate Application System (NOCAS) for applying for height clearance w.r.t. Civil Airports:

6.5.1 AAI has introduced "No Objection Certificate Application System (NOCAS)" accessible at the AAI website www.aai.aero for online submission of NOC application for height clearance. NOCAS carries out calculations w.r.t. OLS and CNS criteria based on site co-ordinates and elevation provided by the applicant. It is mandatory for the applicant to provide surveyed site coordinates in WGS 84 system and site elevation from a Govt. entity or a Govt. approved agency. The applicants are first required to register themselves online and only thereafter, they can submit their applications for NOC. On registering in NOCAS, a NOCAS ID is generated which can be used for future reference including status check of the application. Guidelines for online submission of NOC application for height clearance are available at NOCAS at www.aai.aero.

6.5.2 A table of permissible heights w.r.t. Annex 14 OLS criteria at different distances from the runway (Code 3 or 4 Instrument runway) at an airport are given at Appendix-L of Schedule VIII.

6.6 The permissible heights given therein are only indicative w.r.t. OLS criteria only; detailed calculations w.r.t. CNS and PANS-OPS criteria are needed to arrive at the actual height permissible, which may be lower than the indicated.

7 Definitions and Explanation—

Description of Annex 14 Obstacle Limitation Surface for the purpose of the Schedule II shall be as given hereunder and the illustrations in respect thereof are given in Appendix –H, Appendix-I and Appendix-J of Schedule VIII.

(a) **Conical Surface** – A surface sloping upwards and outwards from the periphery of the inner horizontal surface.

The limits of the conical surface shall comprise:

(i) a lower edge coincident with the periphery of the inner horizontal surface; and

(ii) an upper edge located at a specified height above the inner horizontal surface.

The slope of the conical shall be measured in a vertical plane perpendicular to the periphery of the inner horizontal surface.

(b) **Inner Horizontal Surface** – A surface located in a horizontal plane above an aerodrome and its environs. The radius of outer limits of the inner horizontal surface shall be measured form a reference point or points established for such purpose.

(c) **Inner Approach Surface** – A rectangular portion of the approach surface immediately preceding the threshold. The limits of the inner approach surface shall comprise:

(i) an inner edge coincident with the location of the inner edge of the approach surface but of its own specified length;

(ii) two sides originating at the ends of the inner edge and extending parallel to the vertical plane containing the centerline of the runway; and

(iii) an outer edge parallel to the inner edge.

(d) **Inner Transitional Surface**- A surface similar to the transitional surface but closer to the runway. The limits of an inner transitional surface shall comprise:

(i) a lower edge beginning at the end of the inner approach surface and extending down the side of the inner approach surface to the inner edge of that surface, from there along the strip parallel to the runway centerline to the inner edge of the balked landing surface and from there up the side of the balked landing surface to the point where the side intersects the inner horizontal surface; and

(ii) an upper edge located in the plane of the inner horizontal surface.

(e) **Balked Landing Surface** – an inclined plane located at a specified distance after the threshold extending between the inner transitional surfaces. The limits of the balked landing surface shall comprise:

(i) an inner edge horizontal and perpendicular to the centre line of the runway and located at a specified distance after the threshold;

(ii) two sides originating at the ends of the inner edge and diverging uniformly at a specified rate from the vertical plane containing the centre line of the runway; and

(iii) an outer edge parallel to the inner edge and located in the plane of the inner horizontal surface.

(f) **Take-Off Climb Surface (Annex 14) –** The surface shall be established for a runway meant for take-off. The limits of the take-off climb surface shall comprise:

(i) an inner edge horizontal and perpendicular to the centre line of the runway and located either at a specified distance beyond the end of the runway or at the end of the clear way when such is provided and its length exceeds the specified distance;

(ii) two sides originating at the ends of the inner edge of and diverging uniformity at a specified rate from the take-off to specified final width and continuing thereafter at that width for the remainder of the length of the take-off climb surface; and

(iii) an outer edge horizontal and perpendicular to the specified take-off track.

(g) **Aerodrome Elevation**- The elevation of the highest point of the landing area.

(h) **Aerodrome Reference Point** – The designated geographical location of an Aerodrome.

(i) **Threshold –** The beginning of that portion of the runway usable for landing.

(j) **Displaced Threshold** – A threshold-not located at the extremity of a runway.

(k) **Frangible Object** – An object of low mast designed to break, distort or yield on impact so as to present the minimum hazard to aircraft.

(l) **Obstacle** – All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that are located on an area intended for surface movement or aircraft or that extend above a defined surface (indicated in annexure IV) intended to protect aircraft in-flight.

(m) **Obstacle Free Zone (OFZ)** –The airspace above the inner approach surface, inner transitional surfaces and balked landing surface and that portion of the strip bounded by these surfaces, which is not penetrated by any fixed obstacle other than low mast and frangible mounted one, required for air navigation purposes.

(n) **Runway** – a defined rectangular area on a land aerodrome prepared for the landing and take off of the aircraft.

(o) **Runway End Safety Area (RESA)** – An area symmetrical bout the extended runway centerline and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway.

(p) **Runway Strip**- A defined area including the runway and stop-way, if provided, intended:-

(i) To reduce the risk of damage to aircraft running off a runway; and

(ii) To protect aircraft flying over it during take off or landing operations.

(q) **Clearway** – A defined rectangular area on the ground or water under the control of the appropriate authority selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to specified height.

(r) **Stopway –** A defined rectangular area on the ground at the end of take off run available prepared as suitable area in which an aircraft can be stopped in case of an abandoned take-off.

(s) **Take-off Runway** – a runway intended for take-off only.

(t) **Obstacle Clarence Altitude/Height (OCA/H)** – The lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable used in establishing compliance with appropriate clearance criteria.

(u) **Declared Distances:-**

(i) **Take Off Run Available (TORA)** – The length of the runway declared available and suitable for the ground run of an aeroplane taking off.

(ii) **Take Off Distance Available (TODA)** – The length of take-off run available plus the length of clearway, if provided.

(iii) **Accelerate Stop Distance Available (ASDA)** – The length of take-off run available plus the length of stopway, if provided.

(iv) **Landing Distance Available (LDA)** – The length of the runway declared available and suitable for the ground run of an aeroplane landing.

(v) **Critical Area** – Critical area is an area of defined dimensions about the localizer and glide path antenna where vehicles including aircrafts are excluded during Instrument Landing System (ILS) operations. The critical area is protected because the presence of vehicles and/or aircraft inside its boundary will cause unacceptable discrepancies to the Instrument Landing System (ILS) signal in space.

SCHEDULE III

AERODROMES OPERATED BY AIRPORTS AUTHORITY INDIA AND JOINT VENTURE COMPANIES

S. No.	Airport	State	Coordinates	Aerodrome Elevation in Meters	Runway	Dimension in Meters	Operator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	AGARTALA	TRIPURA	235326N 0911421E	14.63	18/36	2286X45	AAI
2	AGATTI	LAKSHWADEEP ISLANDS (U.T.)	104926N 0721037E	4	04/22	1204 x 30	AAI
3	AHMEDABAD (SVBPI AIRPORT)	GUJARAT	230416.28N 0723735.15E	57.44	05/23	3505 x 45	AAI
4	AIZAWL (TURIAL)	MIZORAM	234443N 0924822E	334	01/19	1190x27	AAI
5	AKOLA	MAHARASHTRA	204152N 0770332E	305	10/28	1219 x 45	AAI
6	AMRITSAR (RAJA SANSI)	PUNJAB	314217N 0744807E	231	16/34	3658 x 45	AAI
7	ASANSOL	WEST BENGAL	2340N 08701E	98	10/28	1826 x 45	AAI
8	AURANGABAD (CHIKAL THANA)	MAHARASHTRA	195152N 0752351E	582	09/27	2835 x 45	AAI
9	BALURGHAT	WEST BENGAL	251547N 0884754E	24	09/27	1097x30	AAI
10	BARAPANI SHILLONG	MEGHALAYA	254212N 0915841E	887	04/22	2286 x 45	AAI
11	BEHALA	WEST BENGAL	223022N 0881748E	3	18/36	861 x 30	AAI
12	BELGAUM (SAMBRA)	KARNATAKA	155131N 0743704E	759	08/26	1830 x 45	AAI
13	BENGALURU INTERNATIONAL AIRPORT (BIAL) DEVANHALLI	KARNATAKA	131155.92N 0774219.70E	914.68	09/27	4000x45	BIAL
14	BHAVNAGAR	GUJARAT	214515N 0721126E	13	07/25	1920 x 45	AAI
15	BHOPAL (RAJA BHOJ AIRPORT)	MADHYA PRADESH	231713N 0772013E	521.82	12/30	2744 x 45	AAI
16	BHUBNESHWAR(BIJU PATNAIK AIRPORT	ORISSA	201448N 0854907E	42.06	14/32	2743 x 45	AAI
17.	BILASPUR	CHATTISGARH	220000N 0820400E	274	06/24 17/35	1448 X 45 1455 X 45	AAI
18	CHAKULIA	JHARKHAND	222736N 0864237E	129	17/35	2221X45	AAI
19	CHENNAI	TAMIL NADU	125941.7N 0801031.8E	15.85	07/25 12/30	3658 X 45 2890 X 45	AAI
20	COCHIN INTERNATIONAL AIRPORT LTD (CIAL)	KERALA	100914N 0762425E	9.14	09/27	3400 x 45	CIAL
21	COIMBATORE (PEELAMEDU)	TAMIL NADU	110137N 0770230E	404	05/23	2990 x 45	AAI
22	COOCH BEHAR	WEST BENGAL	261946.8N 089281.6E	42	04/22	1069 x 30	AAI
23	CUDDAPAH	ANDRA PRADESH	1431N 07847E	131	11/29	1098 x 18	AAI
24	DEESA (PALANPUR)	GUJARAT	241604N 0721218E	145	06/24	1008 x 30	AAI
25	DEHRADUN (JOLLYGRANT)	UTTARAKHAND	301126N 0781056E	565	08/26	2140 x 45	AAI
26	DELHI IGI AIRPORT (PALAM)	DELHI	283407.42N 0770643.69E	236.83	10/28 09/27 11/29	3810 x 45 2813 x 45 4430 x 60	AAI Leased to DIAL
27	DIBRUGARH (MOHANBARI)	ASSAM	272852N 0950105E	110	05/23	2310 x 45	AAI

S. No.	Airport	State	Coordinates	Aerodrome Elevation in Meters	Runway	Dimension in Meters	Operator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
28	DIMAPUR	NAGALAND	255300N 0934616E	148.43	12/30	2290 x 45	AAI
29	DONAKONDA	ANDHRA PRADESH	1550N 7930E	142	04/23	915X30	AAI
30	GONDIA	MAHARASHTRA	2131N 08020E	311.16	05/23	2290 x 45	AAI
31	GUWAHATI (LGBI AIRPORT)	ASSAM	260618N 0913508E	49.38	02/20	3103 x 45	AAI
32	GAYA	BIHAR	244453N 0845633E	115.82	10/28	2286 x 45	AAI
33	HUBLI	KARNATAKA	152147N 0750508E	661.72	08/26	1674 x 30	AAI
34	HYDERABAD (BEGUMPET)	ANDRA PRADESH	172709N 0782750E	531	09/27	3103 x 45	AAI
35	HYDERABAD INTERNATIONAL AIRPORT(HIAL) SHAMSABAD	ANDHRA PRADESH	171426N 0782544E	617	09/27	4260x60	JV Airport operated by HIAL
36	IMPHAL (TULIHAL)	MANIPUR	244551N 0935358E	774.2	04/22	2746 x 45	AAI
37	INDORE DEVI AHILYABAI HOLKAR AIRPORT	MADHYA PRADESH	224324N 0754820E	563.88	07/25	2750 x 45	AAI
38	JABALPUR	MADHYA PRADESH	231100N 0800337E	495	06/24	1988 x 45	AAI
39	JALGAON	MAHARASHTRA	205741.74N 0753728.43E	256	09/27	1700 x 45	AAI
40	JAIPUR (SANGANER)	RAJASTHAN	264927N 0754809E	385	09/27	3500 x 45	AAI
41	JHANSI	UTTAR PRADESH	2529N 07834E	244	15/33	1295 x 45	AAI (Under Army)
42	JHARSUGUDA	ORISSA	215451N 0840303E	228	06/24	1882x45	AAI
43	JOGBANI	BIHAR	2618N 8718E	59	09/27	1525X152	AAI
44	JUHU (MUMBAI)*	MAHARASHTRA	190548N 0725004E	2.74	08/26 16/34	1133 x 30 732x20	AAI
45	KAILASHAHAR	TRIPURA	241828N 920033E	24	03/21	900X30	AAI
46	KAMALPUR	TRIPURA	240754N 0914851E	39	01/19	1372 x 30	AAI
47	KESHOD	GUJARAT	211852N 701610E	51	05/23	1372 x 45	AAI
48	KANDLA	GUJARAT	230642N 0700605E	29	05/23	1524 x 30	AAI
49	KHANDWA	MADHYA PRADESH	21 51N 76 20E	329	10/28	975X46	AAI
50	KHOWAI	TRIPURA	240342N 913627E	29	18/36	915X30	AAI
51	GAGGAL (KANGRA)	HIMACHAL PRADESH	320955N 0761543E	759.6	15/33	1372 x 30	AAI
52	KANPUR (CIVIL)	UTTAR PRADESH	262625N 0802153E	125	10/28	1082 x 45	AAI
53	KHAJURAHO	MADHYA PRADESH	244912N 0795506E	217.4	01/19	2286 x 45	AAI
54	KISHANGARH	RAJASTHAN	2636N 07449E	440	05/23	1700 x45	AAI

*Proposed construction in the approach path of runway 26 at Juhu shall be governed by the recommendation of the report of the Joglekar Committee.
*Sites lying in IHS of Juhu may be considered upto IHS of Santa Cruz in accordance with report of the study of Juhu IHS.

S. No.	Airport	State	Coordinates	Aerodrome Elevation in Meters	Runway	Dimension in Meters	Operator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
55	KOTA	RAJASTHAN	250935N 0755056E	273	08/26	1243 x 38	AAI
56	KOZHIKODE (CALICUT)	KERELA	110816N 0755702E	98.76	10/28	2860 X 45	AAI
57	KOLHAPUR	MAHARASHTRA	163955N 0741729E	606.5	07/25	1370 x 45	AAI
58	KOLKATA (NSCBI AIRPORT)	WEST BENGAL	2239114N 0882648E	7	01R/19L 01L/19R	3627 x 45 3270 x 45	AAI
59	KULLU-MANALI (BHUNTAR)	HIMACHAL PRADESH	315237N 0770919E	1088.8	16/34	1052 x 30	AAI
60	LALITPUR	UTTAR PRADESH	244258N 0782503E	367	10/28	1890 x 45	AAI
61	NORTH LAKHIMPUR (LILABARI)	ASSAM	271726N 0940549E	100	04/22	2286 x 45	AAI
62	LUCKNOW (AMOUSI)	UTTAR PRADESH	264543N 0805300E	123.14	09/27	2742 x 45	AAI
63	LUDHIANA	PUNJAB	305120N 0755706E	254	12/30	1463 x 30	AAI
64	MADURAI	TAMIL NADU	095007N 0780518E	140	09/27	2285 x 45	AAI
65	MALDA	WEST BENGAL	250040N 880750E	24	11/29	1099X30	AAI
66	MANGALORE (BAJPE)	KARNATAKA	125743N 0745323E	102.6	06/24	2450 x 45	AAI
67	MUMBAI (CSI AIRPORT)	MAHARASHTRA	190530N 0725158E	11.9	09/27 14/32	3448 x 60 2871 x 45	AAI Airport Leased to MIAL
68	MUZZAFARPUR	BIHAR	260701N 0851854E	53	11/29	1219 x 30	AAI
69	MYSORE	KARNATAKA	121345N 0763930E	716	05/23 09/27	1350 x 30 1740x30	AAI
70	NADIRGUL	ANDRA PRADESH	171617.8N 0783236.2E	552	14/32	914 x 23	AAI
71	NAGPUR (SONEGAON) (MIHAN)	MAHARASHTRA	210531N 0790254E	314.85	14/32	3200 x 45	AAI airport operated by MIPL
72	PANNA	MADHYA PRADESH	243915N 801540E	424	17/35	1538X18	AAI
73	PANTNAGAR	UTTARAKHAND	290156N 0792821E	233	10/28	1372 x 30	AAI
74	PASSIGHAT	ARUNACHAL PRADESH	2806N 9523E	157	17/35	1006X18	AAI
75	PATNA	BIHAR	253537N 0850531E	51.18	07/25	2072 x 45	AAI
76	PONDICHERRY	PONDICHERRY	115759N 0794843E	43	07/25	1502 x 30	AAI
77	PORBANDAR	GUJARAT	213901N 0693931E	7	09/27	1372 x 45	AAI
78	RAIPUR (MANA)	CHATTISGARH	211052N 0814419E	317.30	06/24	2286 x 45	AAI
79	RAJAHMUNDARY	ANDHRA PRADESH	170631N 0814918E	45	05/23	1750 x 45	AAI
80	RAJKOT	GUJARAT	221834N 0704646E	134.4	05/23	1846 x 45	AAI
81	RANCHI (BIRSA MUNDA AIRPORT)	JHARKHAND	231851N 0851916E	654.71	13/31	2713x45	AAI
82	RAXAUL	BIHAR	26 59 48N 84 49 14E	79	10/28	1097X30	AAI

S. No.	Airport	State	Coordinates	Aerodrome Elevation in Meters	Runway	Dimension in Meters	Operator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
83	RUPSI	ASSAM	2608N 8945E	40	05/23	1829X45	AAI
84	SAFDARJUNG AIRPORT	DELHI	283500N 0771229E	212	12/30	1180 x 45	AAI
85	SALEM	TAMIL NADU	114647N 0780355E	300	04/22	1829 x 45	AAI
86	SATNA	MADHYA PRADESH	2434N 08051E	315	11/29	1829X30	AAI
87	SHIMLA (JUBBARHATTI)	HIMACHAL PRADESH	310454N 0770407E	1540	14/32	1189 x 23	AAI
88	SHOLAPUR	MAHARASHTRA	173735N 0755606E	481	15/33	1365 x 45	AAI
89	SURAT	GUJARAT	210647N 0724435E	6	04/22	2250 x 45	AAI
90	TIRUPATHI	ANDHRA PRADESH	133759N 0793231E	106.75	08/26	2286 x 45	AAI
91	TIRUCHIRAPALLI (TRICHY)	TAMIL NADU	104556N 0784254E	87.78	09/27	2427 x 45	AAI
92	THIRUVANANTHA-PURAM	KERALA	082847N 0765511E	4	14/32	3398 x 45	AAI
93	TEZU	ARUNCHAL PRADESH	27 54N, 96 04E	220	04/22	1372 x 30	AAI
94	TUTICORIN	TAMIL NADU	084317N 780141E	26	10/28	1350 × 30	AAI
95	UDAIPUR (MAHARANA PRATAP AIRPORT)	RAJASTHAN	243703N 0735340E	513.28	08/26	2281 x 45	AAI
96	VADODARA	GUJARAT	221948N 0731308E	39.32	04/22	2469 x 45	AAI
97	VARANASI (BABATPUR)	U.P.	252705N 0825131E	81	09/27	2745 x 45	AAI
98	VELLORE	TAMIL NADU	125424N 0790406E	233	07/25	793 x 150	AAI
99	VIJAYAWADA	ANDHRA PRADESH	163102N 0804812E	25	08/26	2286 x 45	AAI
100	WARANGAL	ANDHRA PRADESH	175452N 0793608E	284	09/27	1859 x 45	AAI

SCHEDULE IV, PART-1
AERODROMES OPERATED BY THE STATE GOVERNMENTS & PRIVATE OWNERS
(CONTROLLED OR PUBLIC USE AERODROMES)

S. No.	Airport	State	Coordinates	Aerodrome Elevation in Meters	Runway	Dimension in Meters	Owner/ Operator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	AIZAWL (LENGPUI)	MIZORAM	235016.88N 0923736.38E	418	17/35	2500x45	SG
2	DIU	UNION TERRITORY	204247N 0705514E	4.9	05/23 13/31	1845x 45 1069x25	U.T.
3	DURGAPUR	WEST BENGAL	233727.7N 0871432.5E	85	16/34	3315x45	BAPL

S. No.	Airport	State	Coordinates	Aerodrome Elevation in Meters	Runway	Dimension in Meters	Owner/ Operator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
4	PUTTAPARTHY	ANDHRA PRADESH	140853N 0774726E	478.23	09/27	2224x45	PVT
5	VIJAYNAGAR	KARNATAKA	151019N 0763837E	502	13/31	1600 x 30	PVT
6	MUNDRA	GUJARAT	225003N 0694552E	5.18	05/23	1700X30	PVT
7	JAMSHEDPUR	JHARKHAND	22 48 46.71N 86 10 10.76E	141.7	08/26	1220X45	PVT
8	BARAMATI	MAHARASHTRA	181335.84N 743522.91E	605	11/29	1172X30	PVT
9	BEAS	PUNJAB	313332N 0752000E	233	16/34	2552X45	PVT
10	LATUR	MAHARASHTRA	182437.9N 0762752.9E	651	05/23	1700X30	PVT
11	NANDED	MAHARASHTRA	191051.73N 0771921.17E	379	10/28	2300X45	PVT
12	OSMANABAD	MAHARASHTRA	181643.55N 0760317.16E	689	04/22	1190X30	PVT
13	YAVATMAL	MAHARASHTRA	202344.27N 0781226.32E	429	08/26	1218X30	PVT

SCHEDULE IV, PART-2
AERODROMES OPERATED BY THE STATE GOVERNMENTS & PRIVATE OWNERS
(UNCONTROLLED OR PRIVATE USE AERODROMES)

S. No.	Airport	State	Coordinates	Aerodrome Elevation In Meters	Runway	Dimension In Meters	Owner/ Operator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	ABU ROAD	RAJASTHAN	242940N 0724652E	255	09/27	1219 X 23	S.G.
2	AKBARPUR	U.P.	2627N 08234E	101	11/29	1829 X 45	S.G.
3	ALIGARH	U.P.	275140N 0780847E	NA	11/29	1097 X 23	S.G.
4	AMBARI	WEST BENGAL	26 34 30N 88 32 30E	107	18/36	1219 X 24	PVT.
5	AMBIKAPUR (DARIMA)	CHATTISGARH	2259N 08312E	579	16/34	1372 X 15	S.G.
6	AMLA	M.P.	2156N 78078E	746	08/26	1067 X 30	S.G.
7	AMRAVATI	MAHARASHTRA	20 48 48N 0774303E	341	08/26	1372 X 30	S.G.
8	AMRELI	GUJARAT	2137N 07113E	137	13/31	914 X 45	S.G.
9	BALDOTA KOPPAL	KARNATAKA	152137N 0761253E	522	10/28	1600x45	PVT.
10	BANASTHALI	RAJASTHAN	26 24 26N 0755209E	308	09/27	1357 X 60	PVT.
11	BANGALORE (IIS)	KARNATAKA	13 01 25N 77 34 13E	933	09/27	655 X 30	PVT.
12	BANSWARA (TILWARA)	RAJASTHAN	23 35 22N 0741841E	180	10/28	1250 X 15	S.G.
13	BASANT NAGAR	ANDHRA PRADESH	1842N 07924E	204	09/27	1529 X 45	PVT.
14	BETUL	M.P.	2152N 7758E	549	08/26	914 X 45	S.G.
15	BHAGALPUR	BIHAR	2515N 08701E	45	09/27	1067 X 30	S.G

16	BHILAI (NANDANI)	CHATTISGARH	2118N 08123E	302	05/23	1524 X 30	PVT.
17	BHIWANI	HARYANA	2850N 07611E	217	12/30	1088 X 23	S.G.
18	B.H.U. FLYING CLUB	U.P.	251513.5N 82 5926.3E	83M	08/26	695 X 45	BHU
19	BIRLAGRAM (NAGDA)	M.P.	2327N 07525E	469	05/23	1463 X 30	PVT.
20	BIRPUR	BIHAR	263034N 0870104E	74	09/27	1097 X 90	S.G.
21	BIRWA	M.P	22 05N 80 35E	552	14/32	1400X24	S.G
22	BOKARO	JHARKHAND	233827N 0860853N	216	13/31	1400 X 45	PVT.
23	BORENGAJULI	ASSAM	2645N 09149E	122	02/20	1020 X 90	PVT.
24	BURHAR (SHAHDOL)	M.P.	231400N 813000E	480	14/32	1224 X 15	PVT.
25	BURNPUR	WEST BENGAL	233751N 0865830N	94	E/W	914 X 90	PVT.
26	BEGUSARAI	BIHAR	2525N 08605E	41	09/27	762 X 90	S.G.
27	BERHAMPUR (KORAPALLI)	ORRISA	191753N 845237E	37	18/36	750X15	S.G.
28	CHANDRAPUR	MAHARASHTRA	19 59 42N 079 13 18E	244	08/26	1000 X 30	S.G.
29	CHHINDWARA	M.P.	2200N 07855E	665	11/29	1486 X 30	S.G.
30	CHILLARI	KERALA	1107N 07553E	770	10/28	1045 X 15	PVT.
31	CHINYALI SAUR	UTTARAKHAND	30 34 59.90N 078 19 22.47E	854	16/34	1000 X 23	S.G.
32	CUTTACK (CHARBATIA)	ORISSA	2033N 08554E	41	04/22 03/31	2286 X 45 1465 X 45	ARC
33	CHETINAD	TAMIL NADU	1010N 07848E	107	06/24 14/32	1829 X 45 1463 X 45	S.G.
34	CHHAPRA	BIHAR	2547N 08446E	53	L/A	914 X 45	S.G.
35	DALTONGANJ	JHARKHAND	24 01 13N 084 05 46E	335	09/27	914 X 45	S.G.
36	DAMOH	M.P.	2402N 07925E	348	06/24	1524 X 76	PVT.
37	DEOGHAR	JHARKHAND	24 26 47N 086 42 26E	110	L/A	731 X 45	SG
38	DHANBAD	JHARKHAND	2350N 08626E	260	09/27	1128 X 23	SG
39	DHANA	M.P.	234507.3N 785142.3E	529	18/36	823 X 41	S.G.
40	DHULIA	MAHARASHTRA	2055N 07444E	289	05/23 09/27	1828 X 45 1372 X 30	S.G.
41	DUMKA	JHARKHAND	24 13 52N 87 16 12E	137	09/27	640 X 90	S.G.
42	DURGAPUR STEEL PLANT	WEST BENGAL	23 34 58N 87 20 25E	88M	12/30	1200x23	NA
43	ETAWAH (SAIFAI)	U.P.	2636 01N 79 03 35E	NA	15/33	1704 X 23	S.G.
44	FAIZABAD	U.P.	26 45 00N 082 09 17E	314	11/29 05/23	1815 X 45 1429 X 45	S.G.

45	FURSATGANJ	U.P.	2615N 08123E	108	09/27	1722 X 45	IGRUA
46	GAUCHER	UTTARAKHAND	301729N 790850E	740	12/30	1200 X 23	S.G.
47	GHAZIPUR	U.P.	2537N 08334E	68.5	07/25	1807 X 45	S.G.
48	GUNA	M.P.	2439N 07721E	495	14/32	914 X 23	S.G.
49	HAMIRGARH	RAJASTHAN	2508N 07437E	419	18/36	1274 X 30	S.G.
50	HADAPSAR (GLIDEROME)	MAHARASHTRA	18 29 32N 073 56 26E	579	E/W	1052 X 121	SG
51	HOSUR	KARNATAKA	12 39 44N 77 46 12E	930	09/27	1219x30	PVT.
52	HIRAKUND	ORISSA	2135N 08400E	208	15/33	1097 X 45	S.G.
53	HISAR	HARYANA	2911N 07546E	214	12/30	1219 X 45	S.G.
54	JAGDALPUR	CHHATTISGARH	1904N 08202E	547	06/24	1125 X 30	S.G.
55	JAKKUR	KARNATAKA	130432N 0773546E	919	08/26	854 X 21	S.G.
56	JASHPURNAGAR	CHHATTISGARH	225558N 0841341E	457	09/27	1067 X 23	S.G.
57	JAYPORE	ORISSA	1853N 08233E	595	16/34	916 X 30	S.G.
58	JHABUA (RANPET)	M.P.	22 46N 74 33E	435	09/27	792 X 30	S.G.
59	JHINGURA	U.P.	2508N 08239E	91	09/27	1220 X 45	S.G.
60	JHUNJHUNU	RAJASTHAN	280620N 752240E	335	10/28	1014 X 15	S.G.
61	KANPUR (KALYANPUR)	U.P.	263113N 801357E	131	09/27	884 X 23	PVT.
62	KANKROLI	Rajasthan	250114N 735359E	532.46	12/30	1100 X 23	PVT.
63	KARAD	MAHARASHTRA	1717N 07409E	576	09/27	1280 X 30	S.G.
64	KARGIL	J & K	343133N 0760924E	2920	02/20	1829 X 30	SG
65	KARNAL	HARYANA	2942N 07702E	246	13/31	1170 X 30	S.G.
66	KASIA (KUSHINAGAR)	U.P.	264612N 835429E	76	11/29	1722 X 23	S.G.
67	KAYATTAR	TAMIL NADU	08 58 12.85N 77 49 12.57E	91	09/27 06/24	1463 X 45 1829 X 30	S.G.
68	KOLAPNI	ASSAM	26 48 07N 93 12 45E	90	04/22	914 X 90	PVT.
69	KHARGONE	M.P	2148N 07533E	276	09/27	1000 X 24	S.G.
70	KISHANGANJ	BIHAR	260433N 875623E	148	09/27	1006 X 90	S.G.
71	LONAVALA (AMBY VALLEY)	MAHARASHTRA	183634N 732242E	689	14/32	1199 X 30	PVT.
72	LALGARH	RAJASTHAN	295100N 740100E	176	L/A	1005 X 174	S.G.
73	MANDLA	M.P	22 30N 80 20E	489	09/27	1800X36	S.G
74	MADHAIGANJ	WEST BENGAL	23 38 30N 87 20 37E	NA	15/33 05/23	1800X50 1400X50	NA
75	MANDVI	GUJARAT	22 50 22N 69 18 17E	5	08/26	1400X30	S.G.

76	MACKEBPUR	ASSAM	2651N 09446E	67	14/32	1005 X 91	PVT.
77	MEERUT	U.P.	2854N 07741E	NA	11/29	1829 X 23	S.G.
78	MITHAPUR (DWARKA)	GUJARAT	222440N 685934E	3.6	07/25	1372 X 45 914 X 45	PVT.
79	MUIRPUR (KORBA)	U.P.	240729N 830217E	405	09/27	823 X 60	PVT.
80	MADHUBANI	BIHAR	261945N 860338E	47	18/36	914 X 45	S.G.
81	MANTALAI	J & K	33 00 13N 75 21 21E	3389	15/33	488 X 30	PVT.
82	MATHANIA	RAJASTHAN	26 26N 073 06E	251	05/23	1737 X 45	S.G.
83	MEHSANA	GUJARAT	233612N 0722230E	85	05/23	914 X 45	S.G.
84	MUNGER	BIHAR	25 20 47N 86 28 59E	41	L/A	732 X 91	S.G.
85	NAGAUR	RAJASTHAN	2712N 07343E	281	05/23	1170 X 30	S.G.
86	NAGDA (BIRLAGRAM)	M.P.	2327N 7524E	366	13/31	1463 X 30	PVT.
87	NAINI/SAINI PITHORAGARH	UTTARAKHAND	293539N 801425E	1463	14/32	1330 X 20	S.G.
88	NARNAUL	HARYANA	2805N 07612E	295	09/27	914 X 23	S.G.
89	NEEMUCH	M.P.	2425N 07452E	497	14/32	1700 X 30	CRPF
90	NEW LANDS	WEST BENGAL	2639N 08948E	122	11/29	1076 X 90	PVT.
91	NEYVELI	TAMIL NADU	1137N 07932E	53	05/23	914 X 30	PVT.
92	NAGARJUNA SAGAR	ANDHRA PRADESH	1632N 07919E	259	NA	1654 X 30	S.G.
93	NARIA SEE SAHARSA	BIHAR	25 53 32N 86 35 00E	40	L/A	457 X 91	S.G.
94	NAWAPARA	ORISSA	2052N 08230E	322	05/23	1002 X 18	S.G.
95	ONDAL AIRPORT	WEST BENGAL	23 37 19N 83 14 35E	82	14/32 04/22	1829 X 45 1463 X 45	S.G.
96	PACHMARHI	M.P.	2227N 07824E	1085	04/22	1200 X 61	S.G.
97	PANNERI	ASSAM	2643N 09154E	91	18/36	1060 X 90	PVT.
98	PATIALA	PUNJAB	3019N 07622E	250	15/33	1097 X 45	S.G.
99	PILANI	RAJASTHAN	282100N 753500E	335	05/23	914 X 45	PVT.
100	PINJORE	HARYANA	304926N 765258E	500	16/34	914 X 45	S.G.
101	PIRTHIGANJ	U.P.	2552N 08201E	94	12/30	1829 X 45	S.G.
102	PITHORAGARH	UTTARAKHAND	2940N 08013E	1463	14/32	1300 X 23	S.G.
103	PADAMPUR	ORISSA	2102N 08303E	198	18/36	914 X 54	S.G.
104	RAIGARH (JINDAL AIRSTRIP)	CHATTISGARH	215613N 832044E	242	10/28	2000X30	PVT.
105	RAIPUR (BAIKUNTH)	CHATTISGARH	21 29 54N 81 47 37E	307	06/24	1353 X 24	PVT.

106	RAJHARA (DHALLI)	CHATTISGARH	20 31 40N 81 04 57E	361	05/23	914 X 45	PVT.
107	REWA	M.P.	2430N 08113E	305	06/24	1200 X 30	S.G.
108	ROURKELA	ORISSA	2216N 08449E	210	09/27	1615 X 30	PVT.
109	RATLAM	M.P.	2322N 7501E	517	08/26	1200 X 23	S.G.
110	SAGAR	M.P	23 45N 78 51E	574	18/36	995X23	S.G
111	SEDAM	KARNATAKA	171000N 771800E	427	05/23	488 X 30	PVT.
112	SEONI	M.P	21 56N 79 30E	633	10/28	1800X30	S.G
113	SHAHDOL	M.P.	2314N 08130E	480	14/32	1224 X 15	S.G.
114	SHIVPURI (BURHAR)	M.P.	2524N 07740E	396	09/27	913 X 23	BSF
115	SHRAVASTI	U.P.	27 30N 82 02E	NA	12/30	1829 X 23	S.G.
116	SIDHI	M.P.	2424N 08149E	366	06/24	1006 X 15	S.G.
117	SIROHI	RAJASTHAN	24 53 32N 72 51 0.9E	297.5	13/31	1830 X 18	S.G.
118	SITAMAU	M.P.	24 01 10N 75 20 17E	479	L/A	823 X 45	S.G.
119	SULTANPUR (AMHAI)	U.P.	2615N 08202E	91	11/29	1829 X 45	S.G.
120	SAHARSA	BIHAR	255334N 863510E	45	09/27	914 X 45	S.G.
121	SAWAI MADHOPUR	RAJASTHAN	260200N 762100E	266	18/36	914 X 45	S.G.
122	TEKANPUR	M.P.	2600N 07816E	213	08/26	1311 X 46	BSF
123	TURA	MEGHALAYA	253942N 902041E	534	16/34	1005 X 30	SG
124	TUSHRA	ORISSA	203043N 832653E	168	06/24	1214 X 45	S.G.
125	UJJAIN	M.P.	2306N 07553E	543	06/24	1219 X 22	S.G.
126	UMARIA	M.P	23 32N 80 48E	451	17/35	1500X25	S.G
127	UTKELA	ORISSA	2006N 08311E	229	04/22	914 X 45	S.G.
128	UTTARKASHI	UTTARAKHAND	7819N 08035	853	16/34	NA	S.G.
129	YINGHIONG	Arunachal Pradesh	28 38 20N 95 01 10E	500	NA	975 X 18	S.G.
130	ZIRO	Arunachal Pradesh	27 35 17N 93 49 42E	1524	18/36	1219 X 30	SG

SCHEDULE -V

DEFENCE AERODROME

S. No.	Airport	State	Coordinates	Aerodrome Elevation In Meters	Runway	Dimension In Meters	Owner/ Operator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	ADAMPUR	PUNJAB	312616N 754526E	247	13/31	2746X45	IAF
2	AGRA	UTTAR PRADESH	270932N 775730E	167.7	05/23	2744X45	IAF

S. No.	Airport	State	Coordinates	Aerodrome Elevation In Meters	Runway	Dimension In Meters	Owner/ Operator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
3	ALLAHABAD	UTTAR PRADESH	252626N 814409E	97.2	12/30	2477X45	IAF
4	AMBALA	HARYANA	302219N 764850E	275	12/30	2815.7X46	IAF
5	ARRAKONAM	TAMIL NADU	130358.73N 794059.98E	85	06/24	4095X46	INDIAN NAVY
6	AWANTIPUR	JAMMU & KASHMIR	335239N 745836E	1647	12/30	3200X45	IAF
7	BAGDOGRA (SILIGURI)	WEST BENGAL	264108N 0881948E	126	18/36	2744 x 45	IAF
8	BAKSHI-KA-TALAB	UTTAR PRADESH	265914N 805336E	124	09/27	2743X46	IAF
9	BAREILLY	UTTAR PRADESH	282519N 792705E	173	11/29	2743X46	IAF
10	BAREILLY	UTTAR PRADESH	282000N 792705E	168	12/30	900X45	ARMY
11	BARRACKPORE	WEST BENGAL	224656N 882146E	06	02/20	1866X45	IAF
12	BENGALURU (HAL)	KARNATAKA	125703N 0773957E	888	09/27	3306 x 45	HAL
13	BHATINDA	PUNJAB	301611N 744523E	203	13/31	2805X46	IAF
14	BHATINDA	PUNJAB	301358.1N 750255.8E	----	09/27 13/31	650X15 1200X50	ARMY
15	BHUJ (RUDRAMATA)	GUJARAT	231713N 0694015E	78	05/23	2515 x 45	IAF
16	BIDAR	KARNATAKA	175429N 772900E	664	08/26	2700X45	IAF
17	BIHTA	BIHAR	253524N 845306E	54	10/28	2210X46	IAF
18	BIKRAM PARK	JAMMU & KASHMIR	325400 750600E	621	03/21	1148X85	ARMY
19	CAMPBELL BAY	ANDAMAN& NICOBAR ISLANDS	070046.75N 0935524.50E	1	05/23	1050X30	INDIAN NAVY
20	CAR NICOBAR	ANDAMAN ISLAND	090915N 924913E	10.8	02/20	2713X46	IAF
21	CHABUA	ASSAM	272742N 950714E	110	05/23	2746X46	IAF
22	CHANDIGARH	UNION TERRITORY	3040N 07647E	314	11/29	2744 x 45	IAF
23	CHARBATIA	ORRISA	2033N 08554E	41	04/22 03/31	2286X45 1465X45	ARC
24	DAMAN	UNION TERRITORY	202559.18N 0725035.22E	12.8	03/21 10/28	1801x45 1001x25	I.C.G
25	DARBHANGA	BIHAR	261137N 855503E	47	10/28	2743X46	IAF
26	DINJAN	ASSAM	273243.1N 941419.7E	120	07/25	575X35	ARMY
27	DUNDIGAL	ANDHRA PRADESH	173740N 782411E	613	10/28	2513X46	IAF
28	GOA (DABOLIM)	GOA	152247.41N 0734940.05E	46	08/26	3430 x 45	NAVY
29	GORAKHPUR	UTTAR PRADESH	264429N 0832709E	78	11/29	2744 x 45	IAF
30	GWALIOR	MADHYA PRADESH	261730N 0781341E	188	06/24	2744 x 45	IAF
31	HAKIMPET	ANDHRA PRADESH	173308N 783133E	613	09/27	2110X46	IAF

S. No.	Airport	State	Coordinates	Aerodrome Elevation In Meters	Runway	Dimension In Meters	Owner/ Operator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
32	HALWARA	PUNJAB	304457N 753751E	239	13/31	2743X46	IAF
33	HALDWANI	UTTRAKHAND	291452N 793239E	478	01/19	150X50	ARMY
34	HASIMARA	WEST BENGAL	264150N 892217E	109	11/29	2744X46	IAF
35	HINDON	UTTAR PRADESH	284223N 772138E	214	09/27	2743X46	IAF
36	JAISALMER	RAJASTHAN	265323N 0705200E	236	04/22	2744 x 45	IAF
37	JALANDHAR	PUNJAB	311750N 753651E	234	14/32	600X45	ARMY
38	JAMMU	JAMMU & KASHMIR	324119N 745017E	291	18/36	2042 x 45	IAF/CE
39	JAMNAGAR	GUJARAT	222800N 700100E	15	06/24	2514X46	IAF
40	JHANSI	UP	252935.4N 783366.9E	---	15/33	1070X20	ARMY
41	JODHPUR	RAJASTHAN	261508N 730300E	217	05/23	2743 x 45	IAF
42	JORHAT	ASSAM	2644N 09411E	91	04/22	2652 x 45	IAF
43	KALAIKUNDA	WEST BENGAL	222012N 871307E	61	17/35	2742X46	IAF
44	KANPUR (CHAKERI)	UTTAR PRADESH	2624N 08025E	124	09/27	2744 x 45	IAF
45	KHALSI	JAMMU & KASHMIR	341900N 765400E	3005	29/11	245.2X27.8	ARMY
46	KOCHI	KERALA	095638.25N 0761623.89E	2	17/35 13/31	1830X46 1416X46	INDIAN NAVY
47	LEH	JAMMU & KASHMIR	3408N 07733E	3256	07/25	2922 x 45	IAF
48	LEH	JAMMU & KASHMIR	3407N 07733E	3256	06/24	400X26	ARMY
49	LEIMAKHONG	MANIPUR	245672N 935113E	841.55	01/19	350X50	ARMY
50	MAMUN CANTT	PUNJAB	321700N 754300E	397	18/36	3234X83	ARMY
51	MANASBAL	JAMMU & KASHMIR	341456N 743855E	1594	17/35	1100X50	ARMY
52	MISSAMARI	ASSAM	264901N 923551.5E	95	05/23	1521X45.72	ARMY
53	NAGROTA	JAMMU & KASHMIR	324700N 745400E	347	02/20	132X15	ARMY
54	NAGTALAO	RAJASTHAN	2625N 7307E	240	02/20	1400	ARMY
55	NAL(BIKANER)	RAJASTHAN	280418N 731225E	215	05/23	2746X45	IAF
56	NALIYA	GUJARAT	231321N 685329E	42	06/24	2743X46	IAF
57	NASIK	MAHARASHTRA	195744.32N 734831.74E	599	09/27	1373X46	ARMY
58	NDA	MAHARASHTRA	182822N 734646E	610	09/27	900X15	NDA
59	OZAR (NASIK)	MAHARASHTRA	2007N 07355E	598	09/27	3000 x 45	HAL
60	PARTAPUR	JAMMU & KASHMIR	3456N 7726E	3081	13/31	75X25	ARMY
61	PATHANKOT	PUNJAB	321402N 0753802E	312	01/19	2744 x 45	IAF

S. No.	Airport	State	Coordinates	Aerodrome Elevation In Meters	Runway	Dimension In Meters	Owner/ Operator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
62	PANAGARH	WEST BENGAL	232824N 87 25 46E	73	15/33	2544X46	IAF
63	PHALODI	RAJASTHAN	270618N 721257E	244	05/23	3050	IAF
64	PATIALA	PUNJAB	301855N 762154E	250	15/33	1170	ARMY
65	PORT BLAIR (VEER SAVARKAR AIRPORT)	ANDAMAN ISLAND	113854N 924406E	5	04/22	3414 x 45	INDIAN NAVY
66	PUNE (LOHEGAON)	MAHARASHTRA	183458N 0735513E	592	10/28	2535 x 45	IAF
67	PURNEA	BIHAR	254543N 872442E	37	09/27	2743X46	IAF
68	RAMNAD	TAMIL NADU	091910.30N 0785823.40E	4	01/19	3017X30	INDIAN NAVY
69	RANCHI	JHARKHAND	231851.3N 851915.8E	-	14/32	263X63	ARMY
70	RANGAPAHAR	NAGALAND	255118N 934220E	182	06/24	238X25	ARMY
71	RATNAGIRI	MAHARASHTRA	170048N 0731944E	92.8	05/23	1800X45	I.C.G
72	SARSAWA (SAHARANPUR)	UTTAR PRADESH	295942N 772532E	271	09/27	2744X46	IAF
73	SEVOKE ROAD	WEST BENGAL	264700N 882700E	144	16/34	883X45	ARMY
74	SHIBPUR	ANDAMAN& NICOBAR ISLANDS	131408.70N 0930259.00E	3	18/36	1000X30	INDIAN NAVY
75	SHARIFABAD	JAMMU & KASHMIR	340500N 744300E	1583	09/27	430	ARMY
76	SILCHAR (KHUMBIGRAM)	ASSAM	245448N 0925851E	103	06/24	1785 x 45	IAF
77	SIRSA	HARYANA	293335N 750027E	199	05/23	2743X46	IAF
78	SRINAGAR	JAMMU & KASHMIR	3359N 07447E	1656.5	13/31	3658 x 45	IAF
79	SULUR	TAMILNADU	110047N 770945E	381	05/23	2520X46	IAF
80	SURATGARH	RAJASTHAN	292317N 735415E	173	05/23	2743X46	IAF
81	TAMBARAM	TAMIL NADU	125419N 800719E	27	05/23 12/30	1514X46 1815X46	IAF
82	TEZPUR	ASSAM	2643N 09247E	70	05/23	2744 x 45	IAF
83	THANJAVUR	TAMIL NADU	104311N 790610E	76	07/25 14/32	1833X45 1465	IAF
84	THOISE	JAMMU & KASHMIR	343914N 772237E	3065	11/29	3050X46	IAF
85	UDHAMPUR	JAMMU & KASHMIR	325411N 750920E	634	18/36	2754X46	IAF
86	UTTARLAI	RAJASTHAN	254841N 712859E	154	02/20	2743X46	IAF
87	YELAHANKA	KARNATAKA	130806N 773636E	928.6	09/27	2440X45	IAF
88	VISHAKAPATNAM	ANDHRA PRADESH	174316N 0831329E	3	05/23 10/28	1829 x 45 3048 x 45	NAVY

SCHEDULE VI
COMMUNICATION, NAVIGATION AND SURVEILLANCE (CNS) FACILITIES LOCATED AWAY FROM THE AIRPORTS

Sl. No.	Station	Name of the facility	Coordinates in WGS 84		Facility Reduced Level (Meter)	Airport responsible to Safeguard the facility
			North	East		
1.	Aligarh	CVOR/DME(HP)	27°49' 45.5"	78 ^{0} 10' 42"	205.00	Delhi IGI
2.	Behrampur	MSSR	19^0 20' 3.4"	84^0 52' 0.2"	37.795	Bhubaneshwar
3.	Bellary	MSSR	15^0 09' 59.36"	76^0 53' 2.01"	489.00	Bangalore (AAI)
4.	Bellary	DVOR/DME(HP)	15^0 9'54.4"	76^0 52' 50"	461.00	Bangalore (AAI)
5.	Bikaner-Lunka 1 LUN	DVOR/DME(HP)	28^0 33' 09.84"	73^0 47' 15.61"	201.77	Jaipur
6.	Bikaner-Lunka 2 LKA	DVOR/DME(HP)	28^{0}11' 20.42"	74^{0}06' 41.267"	255.42	Jaipur
7.	Chillarki	CVOR/DME(HP)	28^0 20' 51.2"	76^0 39' 57.7"	228.6	Delhi IGI
8.	Daman 'DMN'	DVOR/DME	20 26' 32.52"	72 51' 15.95"	12.8	Daman (coastguard)
9.	Daman 'DM'	NDB	20 27' 11.23"	72 51' 09.24"	12.8	Daman (coastguard)
10.	Gulbarga	DVOR/DME(HP)	17^0 18'48.8"	76^0 48' 11"	454.00	Bangalore (AAI)
11.	Jalalabad	CVOR/DME(HP)	27^0 41' 39.6"	79^0 39' 44.7"	55.50	Delhi IGI
12.	Jharsuguda	NDB	21^0 53' 47.6"	84^0 02' 19.5"	237.00	Jharsuguda
13.	Jharsuguda	MSSR	21^{0}54'31.60"	84^0 03' 50.40''	262.00	Jharsuguda
14.	Kanchipuram	DVOR/DME(HP)	12^0 47' 5.8"	79^0 42' 47.2"	82.89	Chennai
15.	Katihar	DVOR/DME	25^{0}36'52.65"	87^{0}33'19.20"	31.00	Kolkata
16.	Katihar	MSSR	25^0 34' 23.01	87^0 33' 20.19"	59.00	Kolkata
17.	Khammampet	NDB	17^0 15' 45"	80^0 08' 15"	116.50	Hyderabad
18.	Pratapgarh	DVOR/DME(HP)	24^0 02' 13.65	74^0 44' 38.16"	500.00	Jaipur
19.	Rajamundri	NDB	17^{0}06' 31"	81^0 49' 18"	42.60	Rajahmundry
20.	Sakras	CVOR/DME(HP)	27^0 50' 54.4"	77^0 00' 29.6"	116.20	Delhi IGI
21.	Sampla	CVOR/DME(HP)	28^0 49' 11.1"	76^0 49' 9.6"	235.90	Delhi IGI
22.	Sikandrabad	CVOR/DME(HP)	28^0 23' 36.2"	77^0 42' 29.2"	203.25	Delhi IGI
23.	Songarh	NDB	21^0 10' 2.5"	73^0 33' 57.4"	121.90	Ahmedabad
24.	Tuticorin	NDB	08^0 43' 32.2"	78^0 01' 32.5"	25.90	Chennai
25.	Vikarabad	NDB	17^0 20' 3.8"	77^0 53' 55.5"	651.50	Hyderabad
26.	Cochin-II	DVOR "CIB"	10^0 07' 05.7''	76^0 40' 42.7"	41.30	Cochin
27.	Portblair	DVOR "PPB"	11^0 38' 58''	92^0 44' 50''	154.43	Port Blair
28	Vizag	DVOR " VVZ"	17^0 40' 08.6''	83^0 15' 11.8''	337.226	Vizag
29	Vizag (Arada Hill)	MSSR	17^0 40' 20.0''	83^0 15' 37.8''	322.00	Vizag
30.	Chennai (PURUR)	MSSR	13^0 01' 46.42"	80^0 09' 20.12"	41.00	Chennai
31.	Kolkata (BADU)	MSSR	22^0 41' 22.76"	88^0 29' 06.05"	27.00	Kolkata
32.	Porbander	MSSR	21^0 38' 28"	69^0 39' 45.00"	32.00	Porbandar

SCHEDULE VII

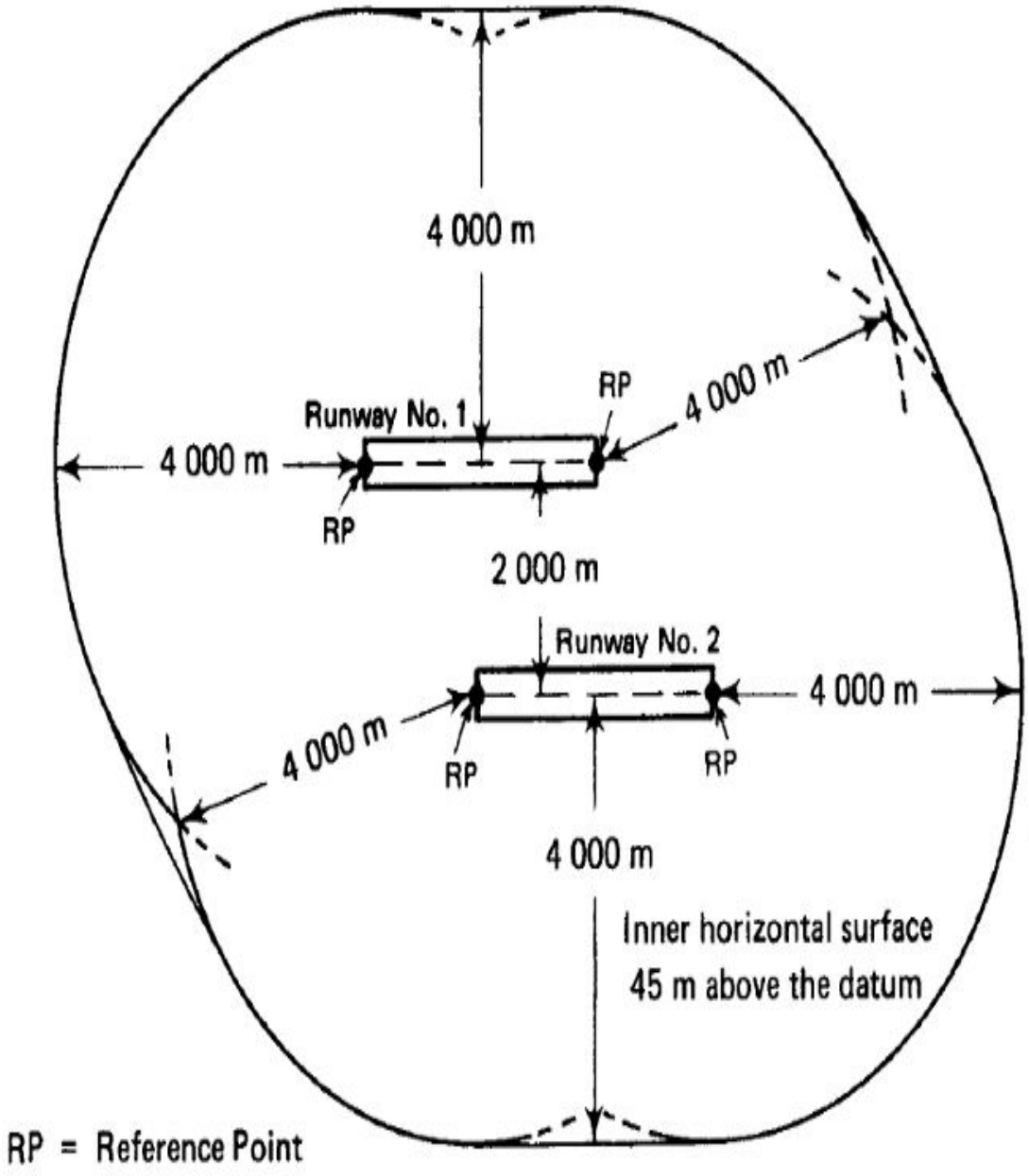
GREENFIELD AIRPORTS

FOR WHICH GOVERNMENT OF INDIA HAS GIVEN

"IN-PRINCIPLE "APPROVAL

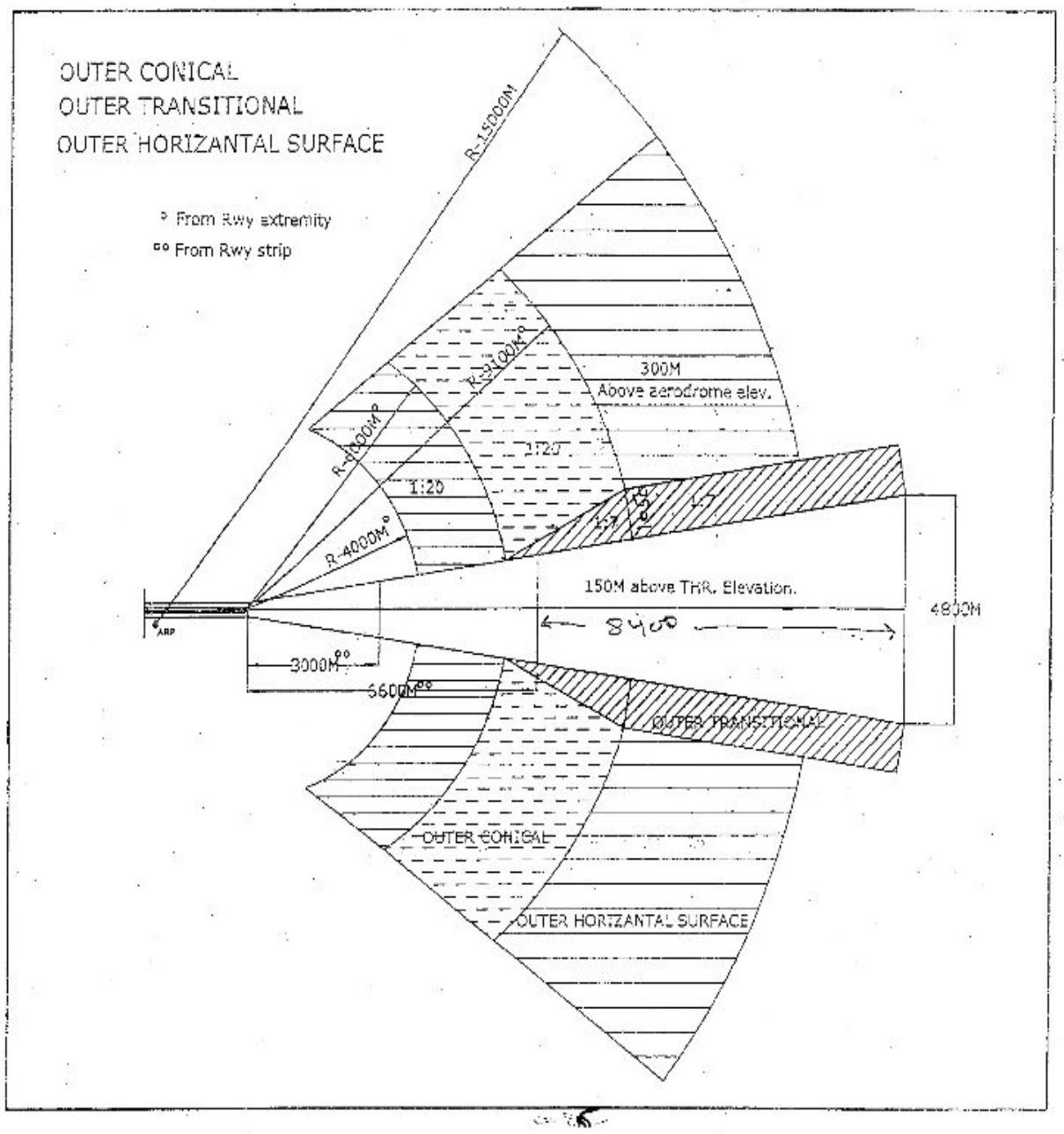
No.	Airport (1)	State (2)	Coordinates (3)	Aerodrome Elevation In Meters (4)	Runway (5)	Dimension In Meters (6)	Owner/ Operator (7)
1.	Dabra	Madhya Pradesh	254942.8N 078191.7E	240	09/27	3000x45	M/s Gwalior Agriculture Company Ltd.
2.	Navi Mumbai Internationa Airport	Maharashtra	18 59 39.78N 073 30 12.95E	8.00	08L/26R 08R/26L	3700x60 3700x60	CIDCO
3.	Pakyong	Sikkim	271358.269N 0883518.7927E	1321.27	02/20	1700x30	AAI
4.	Mopa	GOA	Master Plan of the airport is Yet to be finalized				State Govt.
5.	Kannur	Kerala	11° 54' 56.633"N 75° 32' 44.604"E	105	07/25	3400x45	KIAL
6.	Sindhudurg	Maharashtra	16° 00' 12.17"N 73° 31' 57.9"E	64	09/27	3045x60	MIDC
7.	Bijapur	Karnataka	Master Plan of the airport is Yet to be finalized				State Govt.
8.	Hassan	Karnataka	Master Plan of the airport is Yet to be finalized				State Govt.
9.	Gulbarga,	Karnataka	Master Plan of the airport is Yet to be finalized				State Govt.
10.	Simoga	Karnataka	Master Plan of the airport is Yet to be finalized				State Govt.
11.	Kushinagar International Airport	Uttar Pradesh	Master Plan of the airport is Yet to be finalized				State Govt.
12.	Karaikal Airport	Pudduchery	Master Plan of the airport is Yet to be finalized				State Govt
13.	Shirdi	Maharashtra	19° 41'27.332"N 74° 22' 18.35"E	581.75	09/27	2500x45	MADC

SCHEDULE VIII
APPENDIX -A



Inner Horizontal Surface for runway code 3 & 4

SCHEDULE VIII
APPENDIX -B



SCHEDULE VIII
APPENDIX -C

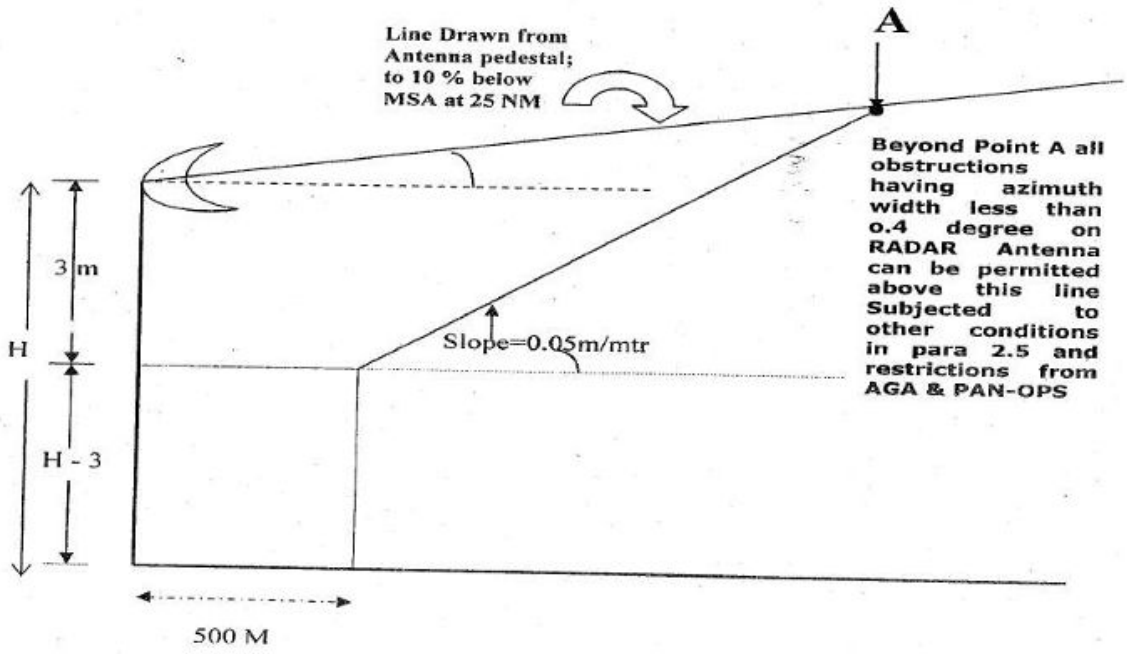


Fig 1 Criteria for height restriction with respect to ASR

SCHEDULE VIII
APPENDIX -D

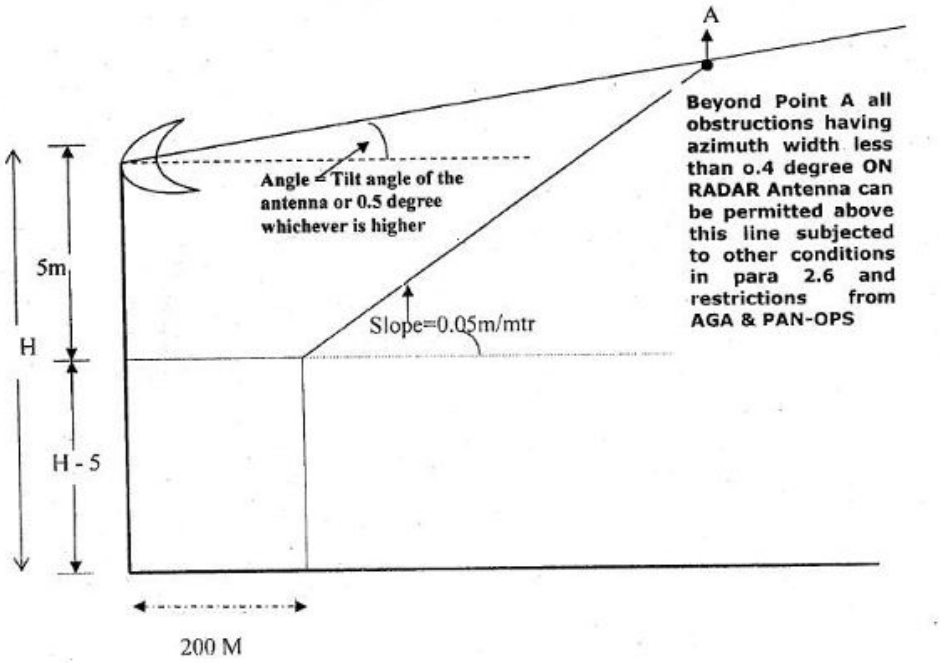
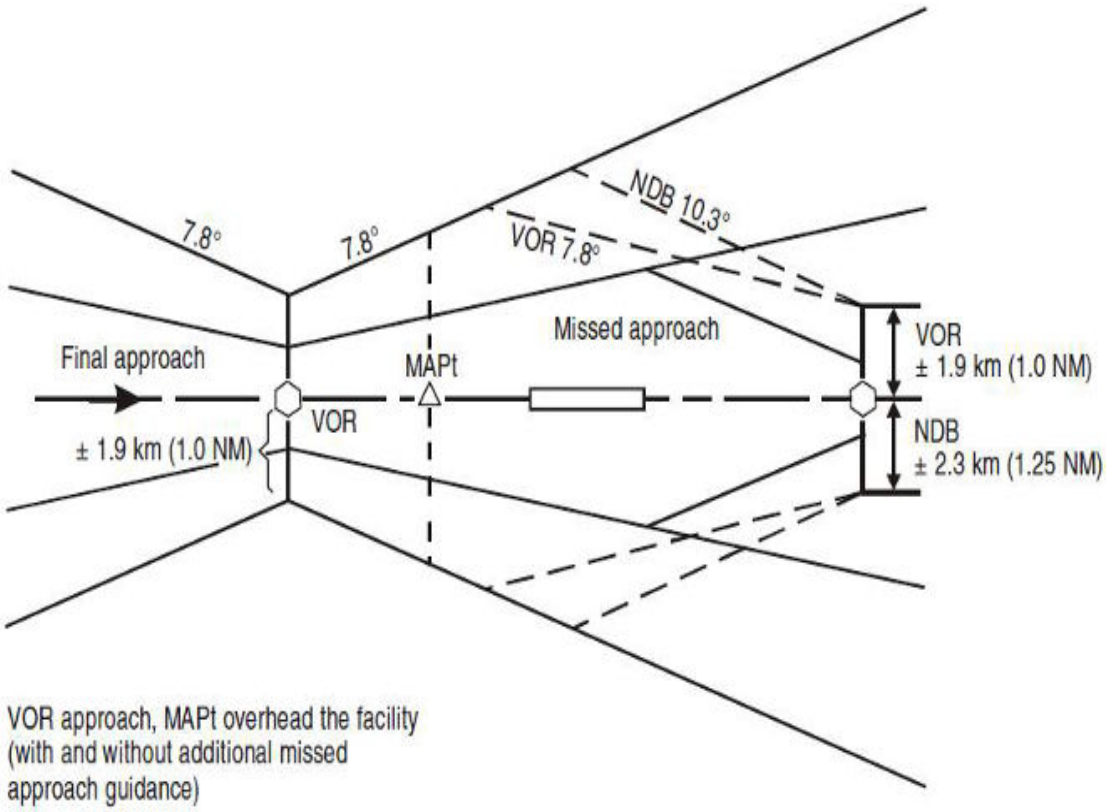


Fig 2 Criteria for height restriction with respect to ARSR

SCHEDULE VIII
APPENDIX -E



VOR approach, MAPt overhead the facility (with and without additional missed approach guidance)

SCHEDULE VIII
APPENDIX -F

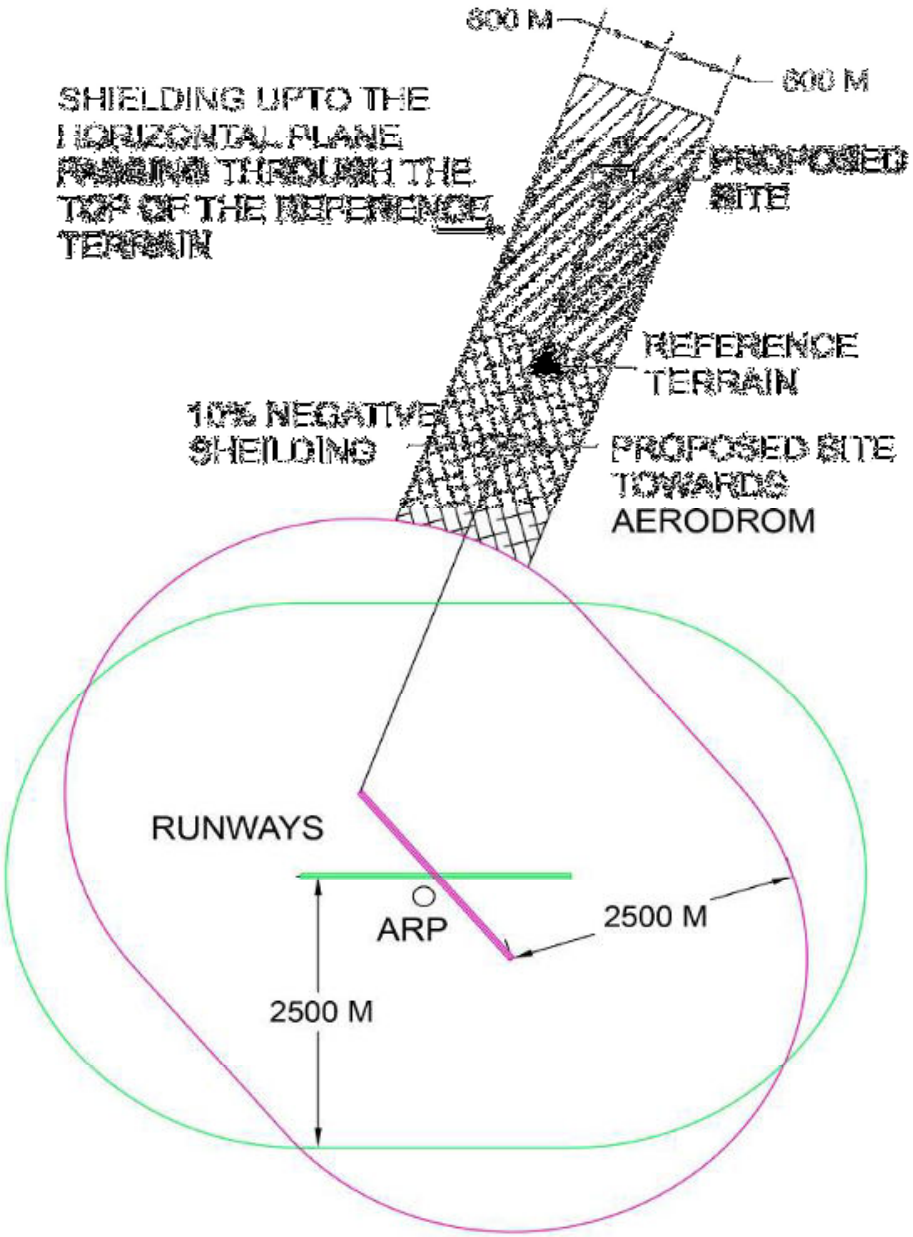


ILLUSTRATION OF SHIELDING CRITERIA FOR AIRPORT CODE NO.3 AND 4

SCHEDULE VIII
APPENDIX -G

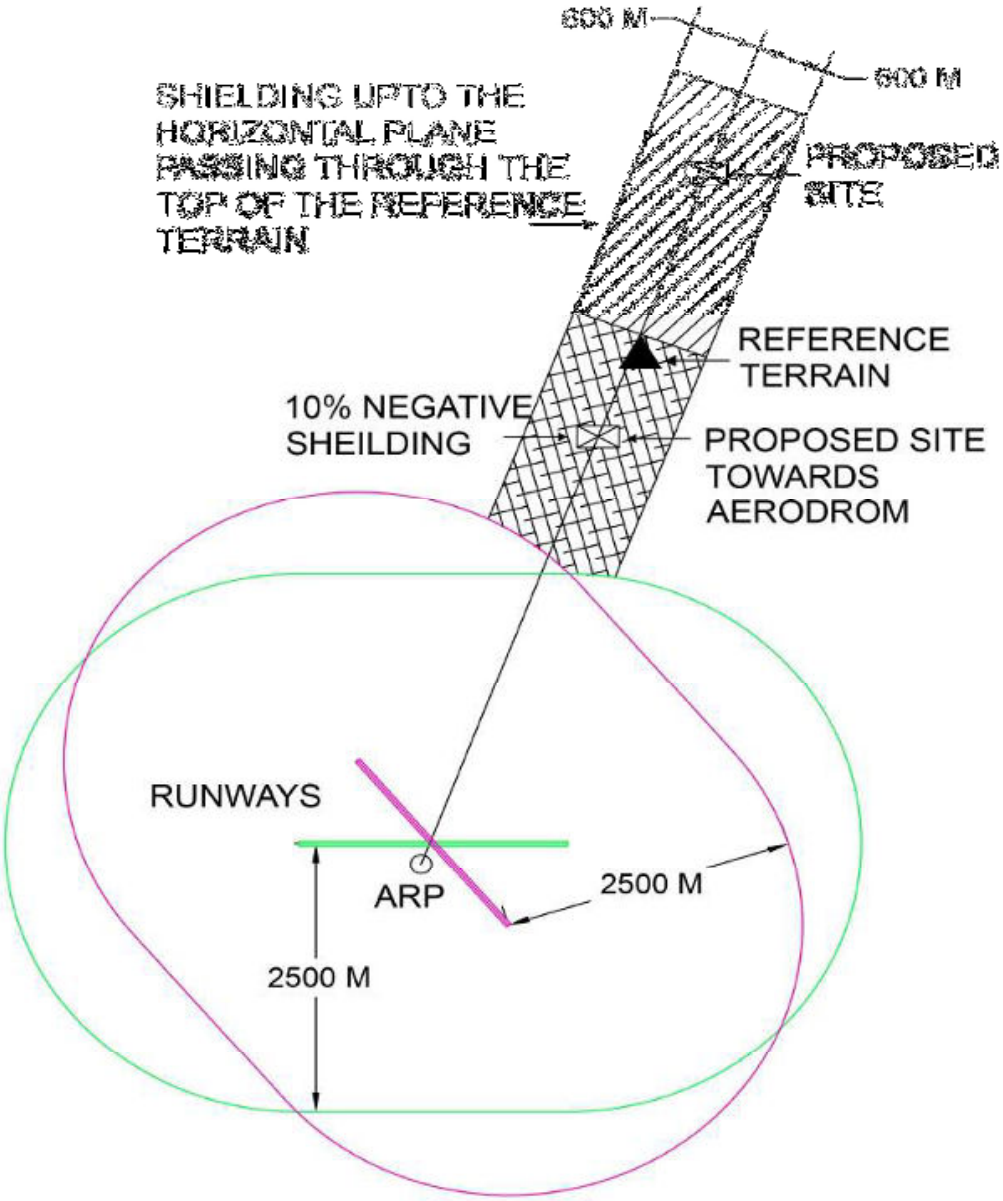
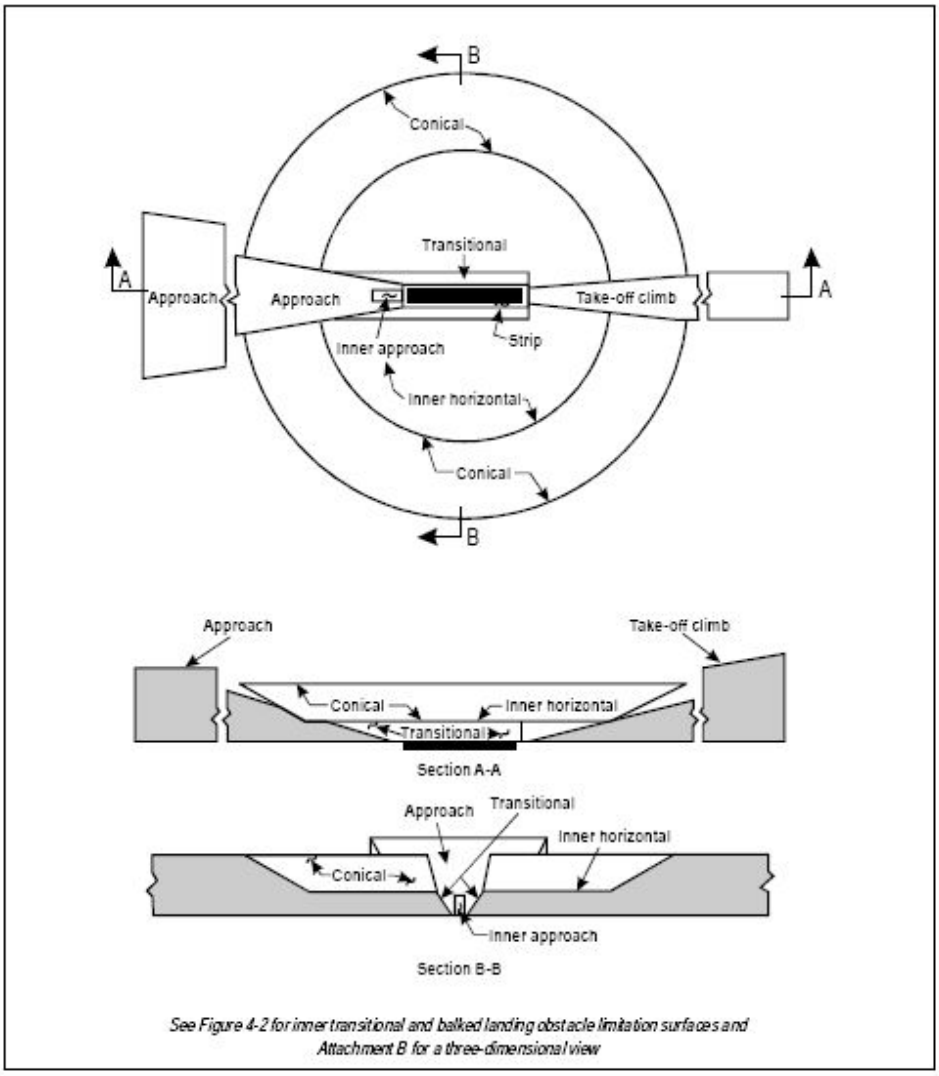


ILLUSTRATION OF SHIELDING CRITERIA FOR AIRPORT CODE NO.1 AND 2

SCHEDULE VIII
APPENDIX -H

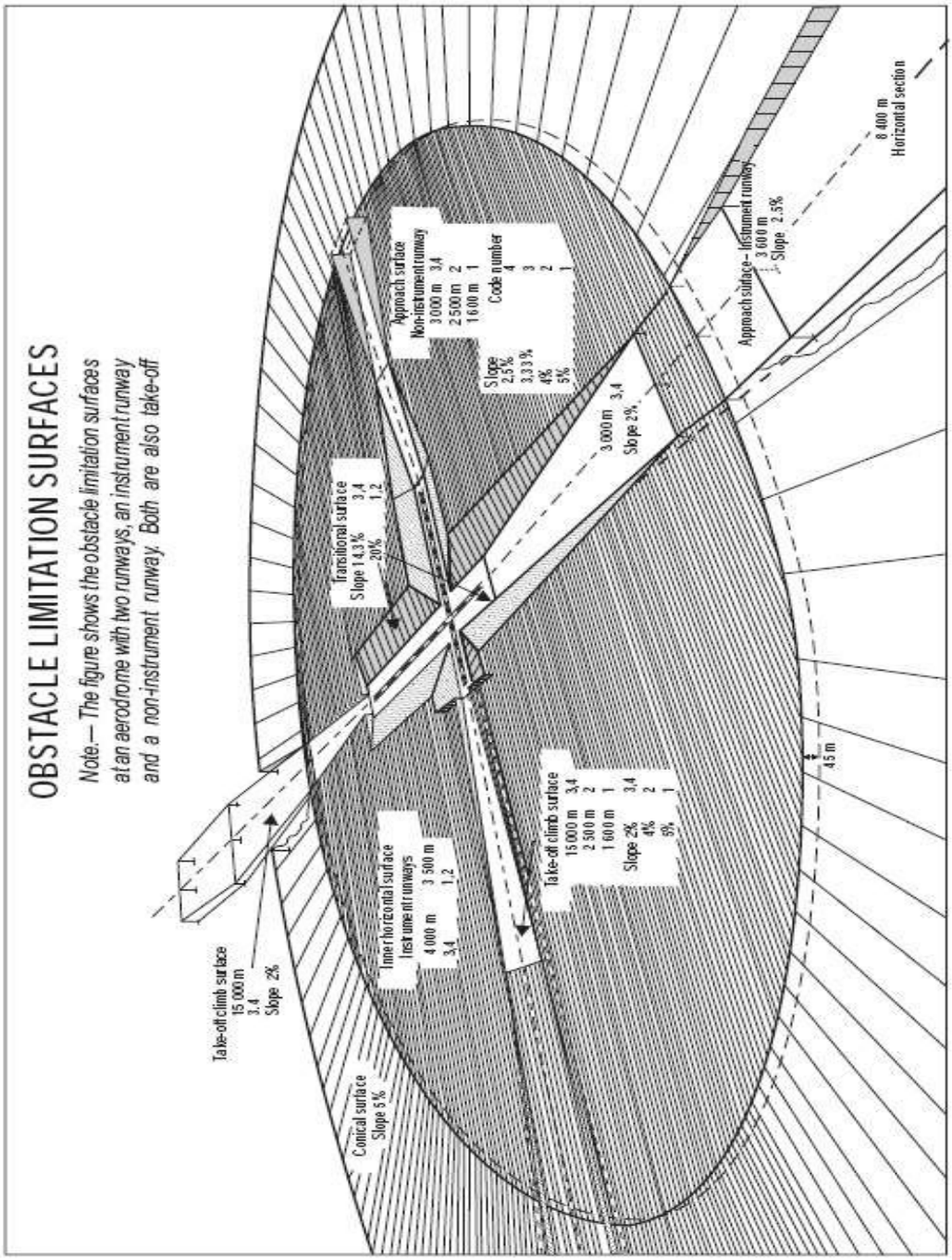
ICAO Annex 14 Obstacle Limitation Surfaces (OLS)



See Figure 4-2 for inner transitional and balked landing obstacle limitation surfaces and Attachment B for a three-dimensional view

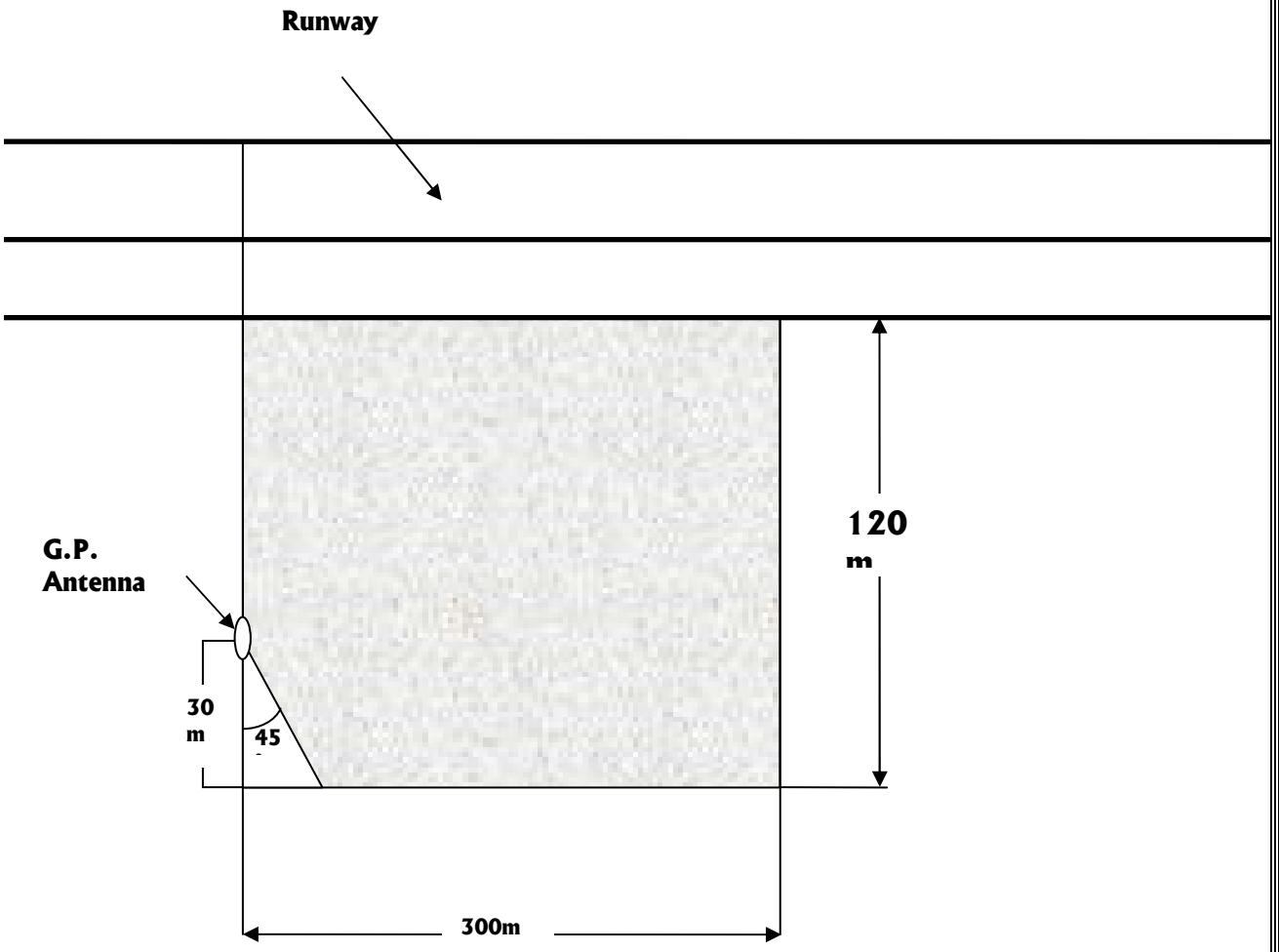
SCHEDULE VIII
APPENDIX -I

Inner approach, inner transitional and balked landing obstacle limitation surfaces



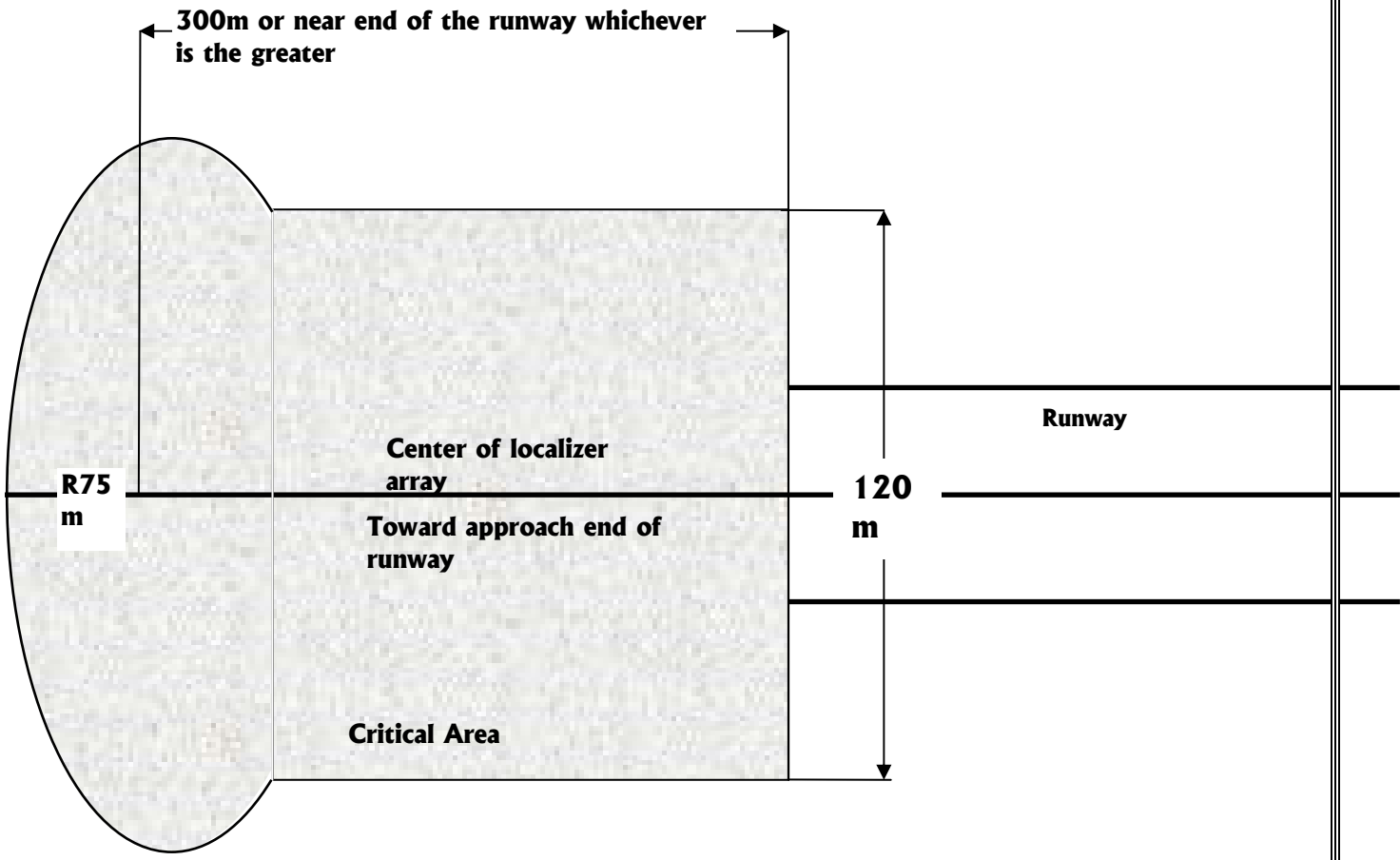
SCHEDULE VIII
APPENDIX -J

Critical Area of G.P.



SCHEDULE VIII
APPENDIX -K

Critical Area of LLZ



SCHEDULE VIII
APPENDIX -L

MAXIMUM PERMISSIBLE HEIGHTS (IN METERS) OF BUILDING/MAST/CHIMNEY, ETC. BASED ON ANNEX 14 CRITERIA (FOR CODE 3 OR 4 INSTRUMENT RUNWAY AIRPORTS ONLY)

Maximum permissible height may be further restricted due to Annex 10 criteria (owing to various CNS facilities) and also due to DOC 8168 criteria for the protection of PANS-OPS surfaces for different procedures. Site elevation of the site will be subtracted from the permissible top elevation to arrive at maximum permissible height of the building/Mast/Chimneys, etc. Following height table is indicative only and in no way assures the height permissible at a given site.

TABLE: MAXIMUM PERMISSIBLE HEIGHTS (IN METERS)

ICAO Annex 14 Surface (Height in meters)	*Distance from Runway Strip (in meters)*														
	500	*1000*	*1500*	*2000*	*2500*	*3000*	*3500*	*4000*	*4500*	*5000*	*6000*	*7000*	*8000*	*9000*	*10000*
*Approach Surface**	*10*	*20*	*30*	*40*	*45*	*45*	*45*	*48*	*73*	*98*	*120*	*140*	*150*	*150*	*150*
*Take-off climb Surface **	*10*	*20*	*30*	*40*	*45*	*45*	*45*	*48*	*73*	*98*	*120*	*140*	*150*	*150*	*150*
*Inner Horizontal Surface (IHS)***	*45*	*45*	*45*	*45*	*45*	*45*	*45*	*45*	-	-	-	-	-	-	-
*Conical Surface **	-	-	-	-	-	-	-	-	*70*	*95*	*145*	*195*	*245*	*295*	*300*

* Runway end elevation should be added to the permissible heights to arrive at the permissible top elevation, AMSL.
** Aerodrome elevation should be added to the permissible heights to arrive at the permissible top elevation, AMSL.

SCHEDULE VIII
APPENDIX -M

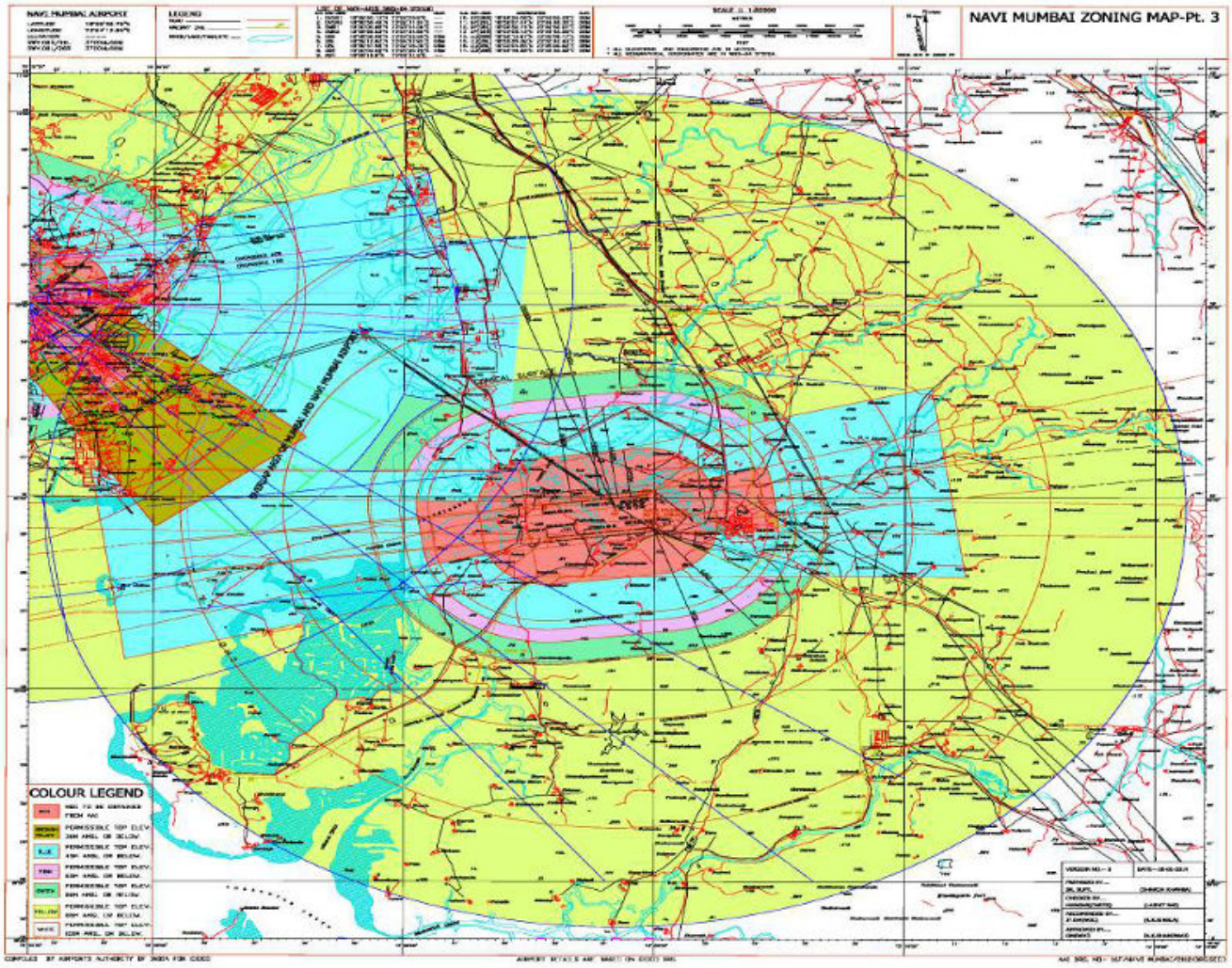
List of Designated Officers of Airports Authority of India (AAI)

Airports Authority of India has set up nine NOC processing offices one each at Delhi, Kolkata, Mumbai, Chennai, Guwahati Hyderabad, Bengaluru, Ahmedabad and Nagpur airports these offices are headed by Designated Officers. NOC offices work as per the provisions of this notification and as per the direction of ATMC 2 of 2013, as amended from time to time by AAI.

The list of Designated Officers are as follows:

1. Regional Executive Director, AAI, Northern Region, Delhi Airport, Delhi
2. Regional Executive Director, AAI, Eastern Region, Kolkata Airport, Kolkata
3. Regional Executive Director, AAI, Western Region, Mumbai Airport, Mumbai
4. Regional Executive Director, AAI, Southern Region, Chennai Airport, Chennai
5. Regional Executive Director, AAI, North Eastern Region, Guwahati Airport, Guwahati
6. GM- Coordination In charge, AAI, Hyderabad Airport
7. GM- Coordination In charge, AAI, Bengaluru Airport
8. Airport Director, AAI, Ahmedabad Airport
9. Airport Director, AAI, Nagpur Airport.

SCHEDULE IX



[F.No. AV-24032/259/2015-AAI]

ARUN KUMAR, Jt. Secy.

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Annexure 5

CTE & CTO obtained from SPCB

REGIONAL OFFICE

GUJARAT POLLUTION CONTROL BOARD

1st floor, Sandip Complex, Narsang Tekri, PORBANDAR 360 577

No. GPCB/RO-POR/ID-36365/PBR-427/599 Date : 16 NOV 2011

To,
M/s. Hiraco Renewable Energy Pvt. Ltd.,
Plot No: 97, 98, 106, 144 to 146, 148,
201to 203, 208 & 209,
Kerala - Bapodar (Guj),
Tal : Ranavav,
Dist.: Porbandar

Sub : **Amendment in Consent to Establish(CTE).**
Ref :(1) Your CTE no.12241 issued on dated 13-10-2011

(2) Your letter no.HIRACO/GPCB/2011 dated 9-11-2011

Sir,
Without prejudice to the powers of this Board under the Water (Prevention and Control of Pollution) Act- 1974, the Air Act- 1981 and the Environment (Protection) Act 1986 and without reducing your responsibilities under the said acts in any way, this is to inform you that this Board is empowered to amend CTE conditions.Accordingly the CTE order stands Amended in respect of the following conditions.

1.The above referred CTE order are Amended as Order No. 12241 issued on dated 13-10-2011 and production capacity of **Electric Power Generation By Solar Energy** is 20MW instead of 15 KWH.
2.The rest of the conditions of the above referred orders shall remain unchanged.
3. You are directed to comply these conditions judiciously

For and on Behalf of
GUJARAT POLLUTION CONTROL BOARD

(B. [illegible])
Regional Officer

Copy to:
The Member Secretary
Gujarat Pollution Control Board
Gandhinagar.....For information please

REGIONAL OFFICE

GUJARAT POLLUTION CONTROL BOARD

1st floor, Sandip Complex, Narsang Tekri, PORBANDAR 360 577

"Consent to Establish "(NOC)

No. GPCB/RO-POR/ID -36365 /PBR 427/ 573/11 Date : 25 OCT

To,
M/s. Hiraco Renewable Energy Pvt. Ltd.,
Plot No: 97, 98, 106, 144 to 146, 148 ,
201to 203, 208 & 209,
Kerala - Bapodar (Guj) ,
Tal : Ranavav,
Dist.: Porbandar

Sub : **Consent to Establish (NOC)** under Section 25 of Water Act, 1974
And Section 21 of Air Act, 1981.

Ref : Your Application No. NIL dated 07/10/2011

Sir, **CTE No. 12241 , issued on dt: 13/10/11.**

Without prejudice to the powers of this Board under the Water (Prevention and Control of Pollution) Act- 1974, the Air Act- 1981 and the Environment (Protection) Act 1986 and without reducing your responsibilities under the said acts in any way, this is to inform you that this Board grants **Consent to Establish (NOC)** for setting up of an industrial plant /activities at Kerala - Bapodar, Tal : Ranavav, Dist Porbandar, for the manufacturing of the following items . The Validity period of the order will be Five years i.e. up to 09/10/2016

Sr. No.	Product	Capacity
1	ELECTRIC POWER GENERATION BY SOLAR ENERGY	15 KWH

CTE No. 12241 , The Validity period of the order will be Five years i.e. up to 09/10/2016.

CONDITIONS UNDER WATER ACT 1974:

1. That shall be no generation of the Industrial effluent from the manufacturing process and other ancillary industrial operations
2. The quantity of the domestic waste water (sewage) shall not exceed 800 lits/day
3. Sewage shall be disposed of through septic tank/soak pit system.

CONDITIONS UNDER AIR ACT 1981 :

4. There shall be no fine gas emission as well process emission from the manufacturing process and other ancillary emission.
5. Ambient air quality within the premises of the industry shall confirm to the following standards :-

PARAMETERS	PERMISSIBLE LIMITED	
	Annual	24 Hrs. Average
Particulate Matter - 10 (PM_{10})	60 Microgram / M^3	100 Microgram / M^3
Particulate Matter- 2.5 ($PM_{2.5}$)	40 Microgram / M^3	60 Microgram / M^3
SO_2	50 Microgram / M^3	80 Microgram / M^3
NO_x	40 Microgram / M^3	80 Microgram / M^3

6. All measures for the control of environmental pollution shall be provided before Commencing production.

CONDITIONS UNDER HAZARDOUS WASTE :

7. Applicant shall have to comply with provisions of Hazardous waste (Management, Handling & Trans Boundary movement) Rule 2008, if there be Hazardous waste generation

7.1 The applicant shall obtain membership of common TSDF site for disposal of Haz Waste at Categorized in Hazardous waste (Management Handling & Trans boundary disposal of incinerable waste.

7.2 The applicant shall provide temporary storage facilities for each type of Hazardous Wastes per Hazardous Waste (Management, Handling & Trans boundary movement Rule - 2008)

GENERAL CONDITION:

8. 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

9 The applicant shall have to submit the returns in prescribed from regarding water consumption and shall have to make payment of water cess to the Board under the Water Cess Act- 1977.

10. 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.

11 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 the Board for this purpose in the prescribed forms under the provisions of the Water Act-1974, the Air Act- 1981 and the Environment (Protection) Act 1986.

12. The applicant also comply with the General condition as per Annexure – attached herewith (No. 1 to 36) (whichever applicant)

13 The concentration of Noise in ambient air within the premises of industrial unit shall not exceed following levels:

Between 6 A.M. And 10 P.M.: 75 dB (A)
Between 10 P.M. and 6 A.M : 70 dB (A)

14. Applicant is required to comply with the manufacturing, Storage and Import of Hazardous Chemicals Rules- 1989 framed under the Environment (Protection) Act- 1986.

15. 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

16. The applicant shall not carried out any activities or projects listed in Schedule of the new EIA Notification dated 14/09/2006 requesting prior Environment Clearance.

For and on Behalf of
GUJARAT POLLUTION CONTROL BOARD

(B. L. Maru)
Regional Officer

No. GPCB/RO-POR/ID-36365 /PBR-427/ 513 /11 Date: 25 OCT 2011

Issued to:

To,
M/s. Hiraco Renewable Energy Pvt. Ltd.,
Plot No: 97, 98, 106, 144 to 146, 148,
201to 203, 208 & 209,
Kerala - Bapodar (Guj),
Tal : Ranavav,
Dist.: Porbandar

Gujarat Pollution Control Board

FORM - 1

[See rule 5(1) and rule 6(1)]

CCA-Fresh - 58291

Application for obtaining Authorization for Collection/ Reception/ Treatment/ Transports/ Storage/ Disposal of Hazardous Waste*

Date : 21/06/2012

PCB-ID : 36589

From : Biraco Renewable Energy Pvt Ltd.
PLOT/PHASE No. 97, 98,106,146,144,145, 148, 201,202,203,208,209,
Bapodar ,
Karela-Bapodar - 360577
DIST : Porbandar, TAL : Ranavav, SIDC : Not In Gide

To,
The Member Secretary,
Gujarat Pollution Control Board
Paryavaran Bhavan, Sector-10/A,
Gandhinagar - 382010

Sir,

I/We hereby apply for authorization/renewal of authorization under sub-rule (3) of rule 5 of the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 for collection / reception / treatment / transport / storage / disposal of hazardous wastes

For Office Use Only

1. Code No.

2. Whether the unit is situated in a critically polluted area as identified by Ministry of Environment and Forests : Yes / No

To be filled in by Applicant

Part-A : General

1. (a) Name and address of the unit and location of activity

Biraco Renewable Energy Pvt Ltd
PLOT/PHASE No. 97, 98, 106, 146, 144, 145, 148, 201, 202, 203, 208, 209,
Bapodar ,
Karela-Bapodar - 360577
DIST : Porbandar, TAL : Ranavav, SIDC : Not In Gide

(b) Authorisation required for

Re-Use by Sell

(c) In case of renewal of authorisation previous authorisation number and date

2. (a) Whether the unit is generating hazardous waste as defined in these Rules and amendments thereof :

Sr.	Source of Hazardous Waste	Qty. / Year
1	Used Oil and Waste Oil	As per specifications prescribed from time to time

5. (a) Total Capital invested on the project (in Rupees) : 23000 Lakhs

(b) Year of Commencement of production : 2011

*Strike whichever is not applicable

Hazardous | 1 - Through XGN | N | C

Gujarat Pollution Control Board

FORM - 1

(See rule 5(3)...)

(c) Whether the industry works general / 2 shifts / round the clock :

6. (a) List and quantum of Products and by - products :

Sr	Product Name	NOC Qty	CCA Qty	Applied Qty	Inspection Remarks
1	Solar Power thru PV Process	15.000	15.000 - KLW	15.000 ...	

(b) List and quantum of Raw materials used :

Sr	Raw Material Name	Capacity - Unit / Month
1	Solar Radiation	15.000 - KLW

7. Furnish a flow diagram of manufacturing process showing input and output in terms of products and waste generated including for captive power generation and de-mineralised water. As per the PDF attached

Part-B : Hazardous Waste

8. Hazardous Waste

Sr	Source of Hazardous Waste	Catg	Qty/Year	HW Disposal Management
1	Used Oil and Waste Oil - As per specifications prescribed from time to time	-20	25.000-MT [illegible]	

9. Hazardous Wastes generated as per the these Rules from storage of hazardous chemicals as defined under the Manuf. Storage and Import of Hazardous Chemicals Rules, 1989

Part-C : Treatment , Storage and Disposal Facility ;

10.Detailed proposal of the facility (to be attached) to include

(i) Location of site (provide map) As per the PDFs attached

(ii) Name of waste processing technology As per the PDFs attached

(iii) Details of processing technology As per the PDFs attached

(iv) Type and quantity of waste to be processed per day As per the PDFs attached

(v) Site clearance (from local authority, if any) As per the PDFs attached

(vi) Utilization programme for waste processed (Product Utilization) As per the PDFs attached

(vii) Method of disposal (details in brief be given) As per the PDFs attached

(viii) Quantity of waste to be disposed per day As per the PDFs attached

(ix) Nature and composition of waste As per the PDFs attached

(x) Methodology and operational details of land filling/incineration. As per the PDFs attached

(xi) Measures to be taken for prevention and control of environmental pollution including treatment of leachates As per the PDFs attached

(xii) Investment on Project and expected returns. As per the PDFs attached

(xiii) Measures to be taken for safety of workers working in the plant. As per the PDFs attached

I We, enclose herewith Cash Receipt No /Bank Draft No 008837(PORBANDAR)

*strike whichever is not applicable

Gujarat Pollution Control Board

Paryavaran Bhavan, [illegible]

FORM - 1

[See rule 5(3) and [illegible]]

& date : 04/06/2012 for Rs :35000 (In words : Thirty Five Thousand Rupees Only)
Pay Remark : 19/06/2012
In favour of the Gujarat Pollution Control Board Paryavaran Bhavan, Sector-10/A,Gandhinagar - 382010 as fees payable under section 25 of the Act.

Details of Previous CTE & CTO : CEF-12241,09/10/2016 & Valid Upto - ---

Validity for 5 Years. Fees Paid for 0/5/5 Years. Catg : Green Scale : Large

Air Amount	Rs. 0	[illegible]
Water Amount	Rs. 5000	(Ww [illegible] Kl/d [illegible])
Haz Amount	Rs. 30000	(Haz Section : Large & Medium Scale, Haz Waste [illegible])

Inward Purpose :

Application for Consent to Operate for energy generation through solar

Other Information :

Place :

Date :

Signature :

Designation :

Rate of Authorisation Fee

Sr. No.	Category	Fee in Rupees (for one year)
1	Common Facility for Final Disposal(TSDF)	[illegible]
2	Common Facility for Incineration	5000
3	Large & Medium Scale	5000
4	Small Scale Industry (Any catg)	[illegible]

*delete whichever is not applicable

REGIONAL OFFICE

GUJARAT POLLUTION CONTROL BOARD

1st floor, Sandip Complex, Narsang Tekri, PORBANDAR 360 577

No: GPCB/RO-POR/ID-36365/PBR-427/999/12 Date:

To,

M/s. Hirako Renewable Energy Pvt. Ltd.,
Plot No:97,98,106 144 to 146,148,
201 to 203,208 & 209,
Kerala-Bapodar (Guj)
Tal: Ranavav
Dist.:Porbandar

Sub: Amendment in Consolidated Consent and Authorization (CCA)

Ref: (1) Your CCA order no WH-12942 issued on dated 22-06-[illegible]

(2) Your letter dated 23-08-12

Sir,

Without prejudice to the powers of this Board under the Water(Prevention and Control of Pollution) Act-1974, the Air Act 1981 and the Environment (Protection) Act 1986 and without reducing your responsibilities under the said acts in any way, this is to inform you that this Board is empowered to amend CCA conditions. Accordingly, the CCA order stands Amended in respect of the following conditions

1. The above referred CCA order are Amended as Order No.WH 12942 issued [illegible] dated 22-06-201[illegible] and production capacity of Electric Power Generation By Solar Energy 20MWH instead of 20KWH.
2. [illegible]
3. You are directed to comply these conditions judiciously

For and on Behalf of
Gujarat Pollution Control Board

(B I Maru)
Regional Officer

Copy to:
The Member Secretary
Gujarat Pollution Control Board
Gandhinagar.......... For information please

REGIONAL OFFICE

GUJARAT POLLUTION CONTROL BOARD

1st floor, Sandip Complex, Narsang Tekri, PORBANDAR 360 5

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 3(c) & 5(5) of the Hazardous Waste (Management and Handling) Rules'1989 & as amended up to year 2 05 framed under Environment (Protection) Act-1986.

And whereas Board has received consolidated consent application letter No. dated 21-06-2012 for the Consolidated Consent and Authorization (CC & A) of this Board under 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;
Hiraco Renewable Energy Pvt Ltd
Plot no.97,98,106,146.144.145,148.201.202,203,208.209
Bapodar
Keral-Bapodar
Ta:Ranavav,Dist: Porbandar

1. **Consent Order No.: WH-12942 date of Issue: 22/06/2012**
2. The consents shall be valid up to **21/06/2017** for use of outlet for the discharge of sewage and emission due to operation of industrial plant for manufacture of following items/products:

Sr. No.	Product	Quantity
1.	Electric Power Generation by Solar Energy	20KWH

3. CONDITIONS UNDER THE WATER ACT:

3.1 The quantity of trade effluent from the factory shall not be nil.

3.2 The quantity of Sewage from the factory shall not exceed 2000 in/day.

3.3 TRADE EFFLUENT:

3.3.1 The effluent conforming to the above standards shall be utilized on land for green and plantation within the premises of the industry.

3.3.2 Domestic effluent shall be disposed off through septic tank/soak pit system and treated separately to conform to the following standards and shall thereafter be

BOD (5 days at 20^0 C)	Less than 20 mg/l
Suspended solids	Less than 30 mg/l
Residual Chlorine	Minimum 0.5 mg/l

4 CONDITIONS UNDER THE AIR ACT:

4.1 There shall be no flue emission as well as process emission from the manufacturing process or other ancillary operation.

4.2 The concentration of the following parameters in the ambient air within the premises of the industry shall not exceed the limits specified hereunder.

PARAMETER	PERMISSIBLE LIMIT
Suspended Particulate matter	200 Microgram Per cubic meter
Oxides of Sulphur	80 Microgram Per cubic meter
Oxides of Nitrogen	80 Microgram Per cubic meter
RSPM	100 Microgram Per cubic meter

4.3 The industry shall take adequate measures for control of noise levels from its various sources within the premises so as to maintain ambient air quality standards in respect of noise to less than 75dB(a) during day time and70 dB (A) during night time. Daytime is reckoned in between 6a.m. and10 p.m. and night time is reckoned between 10 p.m. and 6 a.m

5 **Authorization For The Management & Handling Of Hazardous Wastes Form-2 (See rule 3 (c) & 5 (5) Form for grant of authorization for occupier or operator handling hazardous waste.**

5.1 **Hiraco Renewable Energy Pvt Ltd** is hereby granted an authorization to operate facility for following hazardous wastes on the premises

Sr. No.	Waste	Quantity/ year	Cateory	Facility
1.	Used oil & waste oil	4000litres	5.1	Collection, Storage & sell to registered recyclers only
2.				

5.2 The authorization is granted to operate a facility for collection, storage within facility premises and sell to registered recyclers only

5.3 The authorization shall be in force for a period of **five years** from the date of application

5.4 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 Environmental Protection Act-1986.

6. TERMS AND CONDITIONS OF AUTHORISATION

a) The applicant shall comply with all the provisions of the Environment (Protection) Act 1986 and the rules made there under.

b) The authorisation shall be produced for inspection at the request of an officer authorized by the Gujarat Pollution Control Board.

c) The persons authorized shall not rent, lend, sell, and transfer of otherwise transport the hazardous wastes without obtaining prior permission of the Gujarat Pollution Control Board.

d) Any unauthorized change in personnel, equipment or working conditions as mentioned in the authorisation order by the persons authorized shall constitute a breach of the authorisation.

e) It is the duty of the authorised person to take prior permission of the Gujarat Pollution Control Board to close down the facility.

f) An application for the renewal of an authorisation shall be made as laid down in rule 6(6) (ii).

g) Ind. Shall have to manage waste oil, discarded containers etc as per Amended Rules 2003.

h) Ind. Shall submit annual report within 15 days and sub sequently by 31st January every year.

6. GENERAL CONDITIONS: -

6.1 Any change in personnel, equipment or working conditions as mentioned in the consents form/order should immediately be intimated to this Board

6.2 Applicant shall also comply with the general conditions given in annexure I.

6.3 The waste generator shall be totally responsible for (I.E. Collection, storage, transportation and ultimate disposal) of the wastes generated.

6.4 Records of waste generation, its management and annual return shall be submitted to Gujarat Pollution Control Board in Form – 4 by 31 st January of every year.

6.5 In case of any accident, details of the same shall be submitted in Form – 5 to Gujarat Pollution Control Board

6.6 As per " Public liability Insurance Act – 91" company shall get Insurance policy, if applicable

6.7 Empty drums and containers of toxic and hazards material shall be treated as per guideline published for "management & handling of discarded containers" Records of the same shall be maintained and forwarded to Gujarat Pollution Control Board regularly.

6.8 In no case any kind of hazardous waste shall be imported without prior approval of appropriate authority

6.9 In case of transport of hazardous waste to a facility for (I.E. Treatment, Storage and disposal) existing in a state other than the state where hazardous waste are generated, the occupier shall obtain "No Objection certificate" from the state pollution Control Board, the Committee of the concerned state or Union territory Administration where the facility exists.

6.10 Unit shall take all concrete measures to show tangible results in waste generation reduction, voidance, reuse and recycle. Action taken in this regards shall be submitted within three months and also along with Form – 4.

6.11 Industry shall have to display the relevant information with regard to hazardous waste as indicated in the Hon Supreme Court's order in W.P. No.657 of 1995 dated 14th October 2003.

6.12 Industry shall have to display on-line data outside the main factory gate with regard quantity and nature of hazardous chemicals being handled in the plant, including wastewater and air emissions and solid hazardous waste generated within the factory premises.

For and on behalf of
Gujarat Pollution Control Board

(B.L. Maru)
Regional Officer

NO: GPCB/RO/TECH/JD-36365/PBR-427/ 958/12 19 JUL 2012

ISSUED TO:
Hiraco Renewable Energy Pvt Ltd
Plot no.97,98,106,146,144,145,148,201,202,203,208,209
Bapodar
Kerai-Bapodar
Ta:Ranavav,Dist: Porbandar

Copy to:

1. The Unit Head- Porbandar,
   G.P.C.B., Gandhinagar .... For Information please
2. R.O. File,
   Porbandar,.. For record

FORM-D

[See Rule 20 and rule 21]

CCA-Fresh - 58291

Application for consent to establish or take any step to establish any Industry, operation process or any treatment and disposal system for discharge, under section 25 or continuation or discharge under section 26 of the Water (Prevention and Control of Pollution) Act 1974.

Date : 21/06/2012
PCB-ID : 36365

From : Hiraco Renewable Energy Pvt Ltd.
PLOT/PHASE No. 97, 98,106,146,144,145, 148, 201,202,203,208,209,
Bapodar ,
Karela-Bapodar - 360577
DIST : Porbandar, TAL. : Ranavav, SIDC : Not In Gidc

I/We hereby apply for consent/renewal of consent under section 25 of the Water (Prevention and Control of Pollution) Act.1974 (6 of 1974) to establish or take any step to establish any Industry or operation or process or a treatment and disposal system or any extension or addition to bring into use any new altered outlet for discharge of sewage/trade effluent* to continue to discharge sewage/trade effluent* from land/premises owned by

To,
The Member Secretary,
Gujarat Pollution Control Board,
Paryavaran Bhavan, Sector-10/A,
Gandhinagar - 382010

1	Full name of the applicant	: Vishnu Sharma
2	Nationality of the applicant	: INDIAN
3	Constitution Type	: Pvt. Ltd.
4	Names, Address and Telephone Nos of Applicant	: Vishnu Sharma (9377661201)
5	Address of the industry.	: Hiraco Renewable Energy Pvt Ltd., PLOT/PHASE No. 97, 98,106,146,144,145, 148, 201,202,203,208,209, Bapodar , Karela-Bapodar - 360577 DIST : Porbandar, TAL. : Ranavav, GIDC : Not In Gidc
6	Details of Commissioning etc	: 12/31/2011
7	Total number of employee expected to be employed.	: 10
8	Details of license, if any obtained under the provisions of Industrial Developement Regulation Act, 1951	: Not Applicable

: Vishnu Sharma

* Strike out which is not to apply

FORM-D

[See Rule 20 and rule 21]

9. Name of the person authorised to sign this form (the original authorization except in the case of individual proprietor concern is to be enclosed)

10.(a) List of Raw materials with monthly consumption rate (Monthly Data)

Sr	Raw Material Name	Capacity - Unit / Month
1	Solar Radiation	15.000 - KLW

(b) List of Products with monthly production rate (Monthly Data)

Sr	Product Name	NOC Qty	CCA Qty	Applied Qty	Inspection Remark
1	Solar Power thru PV Process	15.000	15.000 - KLW	15.00	[illegible]

(c) Licence or Annual Capacity of the industry , operation or process etc

11. State daily quantity of water in kilolitres utilized and its source (domestic / industrial process boiler Cooling others

Sr	Water Code (Qty in klpd - Kilo Ltr per Day)	WC : 8.000	WWG : 2.000	Water Source
	Domestic Purpose	10.000	.000	Borewell

12 (a) State the daily maximum quantity of effluents , quantity and mode of disposal (sewer or drain or river or land or in pond or estary tidal waters - sea water - Off share) Also attach analysis report of the effluent
Type of effluent,quantity in kiloliters, Mode of disposal.

(i) Domestic : Water Consumption : 5.000 Kls/Day Waste Water Generation : 2.000 Kls/Day

(ii) Industrial : Water Consumption : 3.000 Kls/Day , Waste Water Generation : 0.000 Kls/Day

Mode of Disposal : Industrial : Septic Tank , Domestic : Septic Tank

Ultimate Receiving Body : Not applicable

Waste Wtr Discharge Pt : Soak pit

Source of water Supply & permission obtained/Applied for : Borewell

(b) Quality of effluent Currently Discharged or expected to be discharged

(c) what monitoring arrangement is currently provided or Proposed.

13.State whether you have any treatment plant for industrial , domestic or combined effluents.

Whether Industry is a member of CETP ? NOT

Boilers=0 , DG Sets=0 , Borewells = 1 , Tubewells: 0 , Capacity of All = 5

Sr	ETP Code	Category Name	Capacity	Units
	OGT	P-Oil Grease Trap	0.10	
			0.10	

14. If yes, attach the description of the process of treatment in brief. Attach information on the quality of treated effluent v/s the standards. State Details of solid wastes generated in the process or during waste treatment.

Sr	Source of Hazardous Waste	Catg	Qty/Year	HW Disposal Management
1	Used Oil and Waste Oil - As per specifications prescribed from time to time	20	25.000 ML - RR	

15. I/We further declare that the information furnished above is correct to the best of my / our knowledge

16. I/We hereby submit that in case of change either of the point of discharge or the quantity of discharge or its quality a fresh application for CONSENT shall be made and until such CONSENT is granted no change shall be brought into as

17. I/We hereby agree to submit to the Pollution Control Board an application for renewal of consent one month in advance of the date of expiry of the consented period for outlet / discharge if, to be continued thereafter

18. I/We undertake to furnish any other information within one month of its being called for by the Gujarat Pollution Control Board

19. I/We, enclose herewith Cash Receipt No./Bank Draft No 008837(PORBANDAR)
& date : 04/06/2012 for Rs :35000 (In words : Thirty Five Thousand Rupees Only)

*Strike out which is not relevant

Gujarat Pollution Control Board

Paryavaran Bhavan, Sector-10 A, Gandhinagar

FORM-D

[See Rule 20 and rule 21]

Pay Remark 19/06/2012

In favour of the Gujarat Pollution Control Board Paryavaran Bhavan, Sector-10/A,Gandhinagar - 382010 as fees payable under section 25 of the Act.

Details of Previous CTE & CTO : CEF-12241,09/10/2016 & Valid Upto - ---

Validity for 5 Years. Fees Paid for 0/5/5 Years. Catg : Green, Scale : Large

Air Amount = **Rs. 0** (Air (Sector) : ---, #Plants : 1, #Inc : 0)
Water Amount = **Rs. 5000** (W.C(klpd) : 1.750)
Haz Amount = **Rs. 30000** (Haz (Sector) : Large & Medium Scale, Haz Waste Catg : 1)

Inward Purpose :

Application for Consent to Operate for energy generation through solar

Other Information :

Signature of the Applicant
(Vishnu Sharma)

Order of slab	Kiloliters of average water Consumption per day	Fee in Rupees
1	Above 0 to 10	000
2	Above 10 to 20	500
3	Above 20 to 30	2000
4	Above 30 to 50	2500
5	Above 50 to 100	3000
6	Above 100 to 500	5000
7	Above 500 to 1000	10000
8	Above 1000 to 5000	20000
9	Above 5000 to 999999	30000

*Strike out which is not relevant

Forwarding & Undertaking Letter from Industry

Important. This Document or its copy does "NOT" serve as a Supporting Document ... Note: ... Application for a NOC / Consent. This Letter does "NOT" ensure that ...

From: Hiraco Renewable Energy Pvt Ltd., Category: GREEN / LARGE
PLOT NO:97, 98,106,146,144,145, 148, 201,202,203,208,209,
bapodar, ...
Karela-Bapodar - 360577
DIST: Porbandar, TAL: Ranavav, SIDC: Not In Gide

To,
The Member Secretary,
Gujarat Pollution Control Board
... Sector 10A
Gandhinagar - 382010

1. We here by Submitting application for CCA ,Inward No : 58291 ,Date : 04 06 2012 for CC&A ...

Applying For: W... Validity : 5 Years

Water Consumption : ... 150 klpd

Scale : 5000 Large & Medium Scale   No of Plants : ...   Incinerator : ...

Investment	Air	Water	Hazardous
230 Crs	0	1000	5000 1000
0 Rs	0 Years	5 Years	5 Years

Payable Fees : Air : 0, Water : 5000, Haz : 30000

Paid Amount : 35000, DD No : 008837, Dt : , at AXI , PORBANDAR

Query Reply

...

2. We have Uploaded the following PDFs

	Date	# Files	Size(kb)	#Page
CCA (Previous Consent, Reply of Cons Order, NOC Order)	19 06 12	1	[illegible]	
... Details of Mfg. Processes & Diagrams	19 06 12	1	[illegible]	
... Any specific information Called for [in SCRUTINY]	19 06 12		[illegible]	
UNI - Undertaking of Non Applicability of Air/Water/Haz	19 06 12		[illegible]	
... Plan LayOut - Site Plan	05 10 11		[illegible]	
SSI - SSI/IEM/CCA Certi / Investment Proofs	05 10 11	1	[illegible]	
DIS - Distance Certificate from Talati	01 10 11	1	[illegible]	
DIR - List of Directors / Partners	28 09 11	1	[illegible]	
... Land Possession Documents	28 09 11		[illegible]	

... submit the full and complete documents and information ... any delay ... in the process ... shall be the responsible for ...

Signature ...
(Vishnu Sh...)

Consultant: SEAI   1 (Through XGN)

भारतीय गैर न्यायिक

एक सौ रुपयें

Rs. 100

ONE HUNDRED RUPEES

रु. 100

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

ગુજરાત गुजरात GUJARAT

સ્ટેમ્પની કિંમત

ખરીદનારનું નામ શ્રી

રહેવાસી

ઓ. સ્ટેમ્પ વેન્ડરની સહી

સરનામું

તારીખ

ખરીદનારની સહી

પોરબંદર

UNDERTAKING

I, Shri Ashok Bajpai aged 58 residing at Kerala-Bapodar Village, Ta. Ranavav, Dist. Porbandar [illegible] having a "Solar Energy Unit" namely M/s. Hiraco Renewable energy Pvt. Ltd. [illegible] Bapodar Village, Ta. Ranavav, Dist. Porbandar.

I as a authorized signatory of above mentioned firm do hereby undertake [illegible]

I undertake that my unit is covered only under Water (prevention and [illegible]) and under Hazardous waste (Management & Handling) rules 1989 [illegible] not covered under Air (Prevention and Control of pollution) Act, 1981.

So, while applying for the CCA for five years, we have not submitted [illegible] 1981.

That is stated as above is true to the best of my knowledge and same I believe [illegible] true.

We assure you that we will follow all rules and regulations of the board.

8 JUN 2012

NOTARIAL

BEFORE ME

NOTARY

भारतीय गैर न्यायिक

एक सौ रुपये

Rs. 100

ONE HUNDRED RUPEES

₹.100

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

गुजरात GUJARAT

UNDERTAKING

I, Shri Ashok Bajpai aged 58 residing at Kerala-Bapodar Village, ... Ranavav, ... Porbandar having a "Solar Energy Unit" namely M/s. Hiraco Renewable Energy Pvt. Ltd. S. No. ... Bapodar Village, ... Ranavav, Dist. Porbandar.

I'm a authorized signatory of above mentioned firm, do hereby undertake that ...

I undertake that my unit is covered only under Water (prevention and Control ... Pollution) Act ... and under Hazardous waste (Management & Handling) rules 1989 as amended ... 2003 and 2008 but not covered under Air (Prevention and Control of pollution) Act, 1981.

So, while applying for the CCA for five years, we have not submitted the application for the ... 1981.

That is stated as above is true to the best of my knowledge and same I ... here ...

We assure you that we will follow all rules and regulations of the board.

8 JUN 2012

NOTARIAL

BEFORE ME

NOTARY

Annexure 6

Self-certification for compliance to avail exemption from routine inspection by GPCB

Hiraco Renewable Energy Pvt. Ltd.

[illegible] Bapodar-Kerala, Taluka - Ranavav
Dist.: Porbandar, Gujarat-360550

To [illegible]

The Member Secretary
Gujarat Pollution Control Board
GANDHINAGAR, (GJ)

Sub. *Self Certification for Compliance to avail exemption from routine inspection by GPCB.*

Ref: Consolidated [illegible] issued by the Board [illegible] WH-12945 dated 22.06.2012 [illegible] 21.06.2017

Sir

We are hereby [illegible] our Self [illegible] to avail the scheme of exemption [illegible] GPCB [illegible]

1. We have [illegible] CCA from GPCB vide above referred letter.
2. We undertake [illegible] the provisions [illegible]
3. The [illegible] as per the consented limits of the CCA
4. There is NO change in type, quality and quantity of raw materials & products as [illegible] our above mentioned consent (CCA) Order and manufacturing process except [illegible] GPCB leading to pollution reduction if required.
5. We are complying with the conditions laid down in CCA issued to us and [illegible] and waste water discharges [illegible] calendar year from our unit are [illegible] CCA
6. We are [illegible] GPCB [illegible] the period [illegible]
7. We undertake to comply with any further condition which may be [illegible] pollution [illegible]
8. We [illegible] NO case against us for violation of provision of any environmental acts [illegible]
9. We [illegible] scheme of exemption [illegible] when required inspite of granting us exemption [illegible] in future shall be binding on [illegible]

The [illegible] is true [illegible] best of my knowledge and submission [illegible] in the above [illegible] will lead to automatic cancellation of the benefit [illegible] unit.

Thanking You

[illegible]

Annexure 7

Filled in Rapid Environmental & Social Assessment Check list

Rapid Environmental Assessment (REA) Checklist

Country:	LOAN 3186 (IND): 20 MW Solar PV Power Project at Village Bopadar, Taluk Ranavav, District Porbandar, Gujarat State
Subproject Title:	20 MW Solar PV Power Project at Village Bopadar, Taluk Ranavav, District Porbandar, Gujarat State
DATE::	15th September, 2016

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			The Project site spread over an area of 118 acres of land located in Village Bopadar, Taluk Ranavav, District Porbandar, Gujarat State. The project has since been commissioned in 18th April, 2012
Physical cultural heritage site		√	The project site has no cultural heritage site, special habitats for biodiversity, special habitat areas, wetlands, mangroves or estuaries or coastal areas within a radius of 10 km.
Located in or near to legally protected area		√	Not Applicable.
Located in or near to special habitats for biodiversity (modified or natural habitats)		√	Not Applicable
Wetland		√	Not Applicable
Mangrove		√	Not Applicable
Estuarine		√	Not Applicable
Offshore (marine)		√	Not Applicable
B. Potential Environmental Impacts Will the Project cause…			
large scale land disturbance and land use impacts specially due to diversion of productive lands?		√	The project development has caused no impacts as the land is single cropped rain dependent agricultural lands. The mean normal annual rainfall of the Project region is less than 600 mm. Also, project development has not altered the existing landform and has used the existing terrain to install the solar panels.
involuntary resettlement of people? (physical displacement and/or economic displacement)		√	None. The project has not caused any involuntary resettlement /displacement of people and lands have been procured based willing seller and willing buyer principle. However, this aspect has been further detailed under social safeguards due diligence report.

Screening Questions	Yes	No	Remarks
disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	This aspect will be separately assessed during social safeguards due diligence by social safeguards specialist. The project, which has been commissioned in April 18, 2012 is providing employment opportunities to local people and have engaged them in the operation and maintenance of the project.
noise, vibration and dust from construction activities?		√	There are no human settlements within 1 Km radius of project site. The construction of project does not warrant large scale earth work excavation and/or filling activities, which may lead to dust, noise and other related impacts. At the time of due diligence, the project was in operation phase, having been commissioned in April 2012.
an increase in local traffic during construction?	√		The impacts limited to construction phase for the transportation of construction materials, plant and machinery required for erection of the plant. At the time of due diligence, the project was in operation phase, having been commissioned in April 2012
environmental disturbances such as soil erosion, land contamination, water quality deterioration, air pollution, noise and vibrations during construction phase?		√	The environmental disturbances will be almost insignificant as the construction and erection of solar power project does not involve any major civil works and all construction related impacts mitigated/controlled through site specific management measures. Moreover, there are no human settlements within 1 Km radius of project site.
aesthetic degradation and property value loss due to establishment of plant and ancillary facilities?		√	There is no existing human settlement within 1-2 Km radius of Project location. Therefore, aesthetic degradation and property loss due to project are not anticipated
changes in flow regimes of the water intake from surface water or underground wells due to abstraction for cooling purposes?		√	The project does not involve any changes to surface water flow regimes. The water requirements of the project, for periodic cleaning of panels is met through existing tube wells from nearby wells and outsourced to local people as service providers
pollution of water bodies and aquatic ecosystem from wastewater treatment plant, from cooling towers, and wash-water during operation?		√	The project does not generate any polluted or liquid waste effluents.
a threat to bird or bat life from colliding with the project facilities and/or being burned by concentrated solar rays?		√	Not relevant as the solar panels installed at the plant does not cause any such impacts. Consultations with the operational personnel of the project has not observed any fatalities to bird or bats in the last 2-3 years of operation (since April 2012).

Screening Questions	Yes	No	Remarks
industrial liquid (dielectric fluids, cleaning agents, and solvents) and solid wastes (lubricating oils, compressor oils, and hydraulic fluids) generated during construction and operations likely to pollute land and water resources?		√	Not relevant
Soil/water contamination due to use of hazardous materials or disposal of broken or damaged solar cells (photovoltaic technologies contain small amounts of cadmium, selenium and arsenic) during installation, operation and decommissioning?		√	Not relevant
noise disturbance during operation due to the proximity of settlements or other features?		√	No settlements are located within a radius of 1 Kms from the Project site. Also, the project does not have major plant & machinery, causing significant noise and vibrations.
visual impacts due to reflection from solar collector arrays resulting in glint or glare?		√	Not relevant as there are no human settlements in and around the proposed site within a radius of1 km.
large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	Not relevant
social conflicts between local laborers and those from outside the area?		√	Not relevant. Project has provided employment opportunities to local people to the extent possible in all aspects of operation and maintenance phase.
risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during construction, installation, operation, and decommission?		√	None
risks to community health and safety due to the transport, storage, and use and/or disposal of materials and wastes such as explosives, fuel and other chemicals during construction, and operation?		√	None
community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		√	None

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: LOAN 3186(IND): 20 MW Solar PV Power Project at Village Bopadar, Taluk Ranavav, District Porbandar, Gujarat State

Sector:

Subsector:

Division/Department: Energy Division, South Asia Department

Screening Questions		Score	Remarks[1]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	Not applicable to this Project. The site is not located in a flood prone or land slide area. Although, the project region, reportedly will experience a few dust storms, every year. However, no losses to civil structures or property loss or natural calamity has occurred as a result of dust storms.
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	All Civil Structures within the Project site are designed for wind load/speed and Earthquake resistant design.
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	The variations in the climatic conditions like extent of cloud cover, or sun shine, dust storms will have bearing on capacity utilization factor (CUF) of the Project. However, the Project design considers all such data and variations (based on historical database) as well as actual measurements at project site and therefore any such changes/variations are deemed to be already considered in the project.
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	0	Not likely all the known historical variations /extreme conditions will be considered in scheduling sand costing of the project
Performance of	Would weather/climate conditions, and		The variations in the climatic

[1] If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

project outputs	related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	conditions like extent of cloud cover, or sun shine, dust storms will have bearing on capacity utilization factor (CUF) of the Project. However, the Project design considers all such data and variations (based on historical database) as well as actual measurements at project site and therefore any such changes/variations are deemed to be already considered in the project. Not likely for the reasons mentioned above

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): √ **LOW**

Prepared by: **HARI PRAKASH**,
Environmental Specialist
ADB TA Consultant

ENVIRONMENTAL / SOCIAL CATEGORIZATION FORM

A. Instructions

The project team completes and submits this form to the Environment and Social Safeguard Unit (ESSU) for endorsement and for approval by the Chief Compliance Officer (CCO).
The classification of a project is a continuing process. If there is a change in the project components or/and site that may result in category change, the concerned unit must submit a new form and requests for recategorization, and endorsement by ESSU. The old form is attached for reference.
The project team indicates if the project requires broad community support (BCS) of tribal peoples communities. BCS is required when project activities involve (a) commercial development of the cultural resources and knowledge of indigenous peoples, (b) physical displacement from traditional or customary lands; and (c) commercial development of natural resources within customary lands under use that would impact the livelihoods or the cultural, ceremonial, or spiritual use that define the identity and community of indigenous peoples.

B. Project Data

Borrower: IREDA, MNRE, Govt. of India	Financing Amount:
Technology: Crystalline	Address/Contact:

C. Subject

■ Environment	☐ Involuntary Resettlement	☐ Indigenous (Tribal) People

C. Categorization

■ New ☐ Re-categorization — Previous Category

☐ Category A	■ Category B	☐ Category C

D. Basis for Categorization/ Recategorization (pls. attach documents):

[√] Checklist and Type of Check List: Filled in REA Checklist
[√] Project and/or Site Description: Brief **write up on the observations made during the visit to Project site along with applicable Country Regulatory required materials are given in Annexure-1.**
[ ] Other (e.g., due diligence): _____

E. Comments

Technical Team	ESSU Comments

F. Approval

Proposed by:		**Endorsed by**:	
Technical Team Leader: HARI PRAKASH Date:  **Endorsed by**:		Head, ESSU: KHEKIHO YEPTHO Date: 	
		Approved by (Optional):	**ADB Concurrence**
Director of Technical Date:		Compliance Officer (if different) Date:	

SOCIAL SAFEGUARDS SCREENING CHECKLIST

Subproject: 20 MW Solar Photovoltaic Power Project at Bapodar and Kerala Village in Porbandar in the State Of Gujarat (India) developed by Hiraco Renewable Energy Private Limited (HREPL).

I. Involuntary Resettlement Impact Checklist

Probable Involuntary Resettlement Effects	**Yes**	**No**	**Not Known**	**Remarks**
Involuntary Acquisition of Land				
1. Will there be land acquisition?	√			This is not an involuntary acquisition of land. Private land and are directly purchased from landowners on willing buyer – willing seller basis.
2. Is the site for land acquisition known?	√			Yes it is in Bapodar and Kerala Village in Porbandar District in the state of Gujarat
3. Is the ownership status and current usage of land to be acquired known?	√			Privately owned land
4. Will easement be utilized within an existing Right of Way (ROW)?		√		
5. Will there be loss of shelter and residential land due to land acquisition?		√		
6. Will there be loss of agricultural and other productive assets due to land acquisition?		√		The land are low productive land
7. Will there be losses of crops, trees, and fixed assets due to land acquisition?		√		
8. Will there be loss of businesses or enterprises due to land acquisition?		√		
9. Will there be loss of income sources and means of livelihoods due to land acquisition?		√		
Involuntary restrictions on land use or on access to legally designated parks and protected areas				
10. Will people lose access to natural resources, communal facilities and services?		√		
11. If land use is changed, will it have an adverse impact on social and economic activities?		√		
12. Will access to land and resources owned communally or by the state be restricted?		√		
Information on Displaced Persons:				
Any estimate of the likely number of persons that will be displaced by the Subproject? [√] No [ ] Yes If yes, approximately how many? _____				

Are any of them poor, female-heads of households, or vulnerable to poverty risks?	**[√] No [ ] Yes**
Are any displaced persons from indigenous or ethnic minority groups?	**[√] No [ ] Yes**

2. Indigenous Peoples Impact Screening Checklist

KEY CONCERNS (Please provide elaborations on the Remarks column)	**YES**	**NO**	**NOT KNOWN**	**Remarks**
Indigenous Peoples Identification				
1. Are there socio-cultural groups present in or use the subproject area who may be considered as "tribes" (hill tribes, schedules tribes, tribal peoples), "minorities" (ethnic or national minorities), or "indigenous communities" in the subproject area?		√		
2. Are there national or local laws or policies as well as anthropological researches/studies that consider these groups present in or using the subproject area as belonging to "ethnic minorities", scheduled tribes, tribal peoples, national minorities, or cultural communities?				Not Applicable
3. Do such groups self-identify as being part of a distinct social and cultural group?				Not Applicable
4. Do such groups maintain collective attachments to distinct habitats or ancestral territories and/or to the natural resources in these habitats and territories?				Not Applicable
5. Do such groups maintain cultural, economic, social, and political institutions distinct from the dominant society and culture?				Not Applicable
6. Do such groups speak a distinct language or dialect?				Not Applicable
7. Has such groups been historically, socially and economically marginalized, disempowered, excluded, and/or discriminated against?				Not Applicable
8. Are such groups represented as "Indigenous Peoples" or as "ethnic minorities" or "scheduled tribes" or "tribal populations" in any formal decision-making bodies at the national or local levels?				Not Applicable
B. Identification of Potential Impacts				
9. Will the subproject directly or indirectly benefit or target Indigenous Peoples?				Not Applicable
10. Will the subproject directly or indirectly affect Indigenous Peoples' traditional socio-cultural and belief practices? (e.g. child-rearing, health, education, arts, and governance)		√		
11. Will the subproject affect the livelihood systems of Indigenous Peoples? (e.g., food production system, natural resource management, crafts and trade, employment status)		√		

KEY CONCERNS (Please provide elaborations on the Remarks column)	YES	NO	NOT KNOWN	Remarks
12. Will the subproject be in an area (land or territory) occupied, owned, or used by Indigenous Peoples, and/or claimed as ancestral domain?		√		
C. Identification of Special Requirements *Will the subproject activities include:*				
13. Commercial development of the cultural resources and knowledge of Indigenous Peoples?		√		
14. Physical displacement from traditional or customary lands?		√		
15. Commercial development of natural resources (such as minerals, hydrocarbons, forests, water, hunting or fishing grounds) within customary lands under use that would impact the livelihoods or the cultural, ceremonial, spiritual uses that define the identity and community of Indigenous Peoples?		√		
16. Establishing legal recognition of rights to lands and territories that are traditionally owned or customarily used, occupied or claimed by indigenous peoples ?		√		
17. Acquisition of lands that are traditionally owned or customarily used, occupied or claimed by indigenous peoples ?		√		

D. Anticipated subproject impacts on Indigenous Peoples

Subproject component/ activity/ output	Anticipated positive effect	Anticipated negative effect
1. Establishment of Wind Power Plant	Indirect only as it is power generation only and not related to distribution system.	None
2. Land requirement	None	No IP community land involved and affected.

INVOLUNTARY RESETTLEMENT (IR) CATEGORIZATION FORM

A. Instructions

The project team completes and submits this form to the Environment and Social Safeguard Unit (ESSU) for endorsement and for approval by the Chief Compliance Officer (CCO).

The classification of a project is a continuing process. If there is a change in the project components or/and site that may result in category change, the concerned unit must submit a new form and requests for re-categorization, and endorsement by ESSU. The old form is attached for reference.

The project team indicates if the project requires broad community support (BCS) of tribal peoples communities. BCS is required when project activities involve (a) commercial development of the cultural resources and knowledge of indigenous peoples, (b) physical displacement from traditional or customary lands; and (c) commercial development of natural resources within customary lands under use that would impact the livelihoods or the cultural, ceremonial, or spiritual use that define the identity and community of indigenous peoples.

B. Project Data

Hiraco Renewable Energy Private Limited (HREPL)	Financing Amount:
Technology: Photovoltaic Solar Power Project with Multi Crystalline Silicon PV solar cells	Address/Contact: **Hindustan Cleanenergy Limited** 239, Okhla Industrial Estates, Phase III, New Delhi – 110020, India Tel: 011-47624100 Extn. 105 I (D)011-47624105 Fax: 011-47624229 Website: www.hindustanpowerprojects.com

C. Subject

☐ Environment	☒ Involuntary Resettlement	☐ Indigenous People

C. Categorization

☐ New ☐ Re-categorization — Previous Category

☐ Category A	☐ Category B	☒ Category C

D. Basis for Categorization/ Re-categorization (pls. attach documents):

[√] Checklist and Type of Check List: Social Safeguard Screening

[ ] Project and/or Site Description: _____

[ ] Other (e.g., due diligence): _____

E. Comments

Technical Team	ESSU Comments
	No involuntary land acquisition for the plant. The developer purchased Private land directly from landowners by paying negotiated market value on willing seller- willing buyer basis. No involuntary resettlement arises in the project.

F. Approval

Proposed by:	**Endorsed by**:	
Technical Team Leader: M K Mohanty Date: **Endorsed by**:	Head, ESSU: Khekiho Yeptho Date:	
	Approved by (Optional):	**ADB Concurrence**
Director of Technical Date:	Compliance Officer (if different) Date:	

SOCIAL CATEGORIZATION FORM

A. Instructions

The project team completes and submits this form to the Environment and Social Safeguard Unit (ESSU) for endorsement and for approval by the Chief Compliance Officer (CCO).
The classification of a project is a continuing process. If there is a change in the project components or/and site that may result in category change, the concerned unit must submit a new form and requests for re-categorization, and endorsement by ESSU. The old form is attached for reference.
The project team indicates if the project requires broad community support (BCS) of tribal peoples communities. BCS is required when project activities involve (a) commercial development of the cultural resources and knowledge of indigenous peoples, (b) physical displacement from traditional or customary lands; and (c) commercial development of natural resources within customary lands under use that would impact the livelihoods or the cultural, ceremonial, or spiritual use that define the identity and community of indigenous peoples.

B. Project Data

Borrower: Hiraco Renewable Energy Private Limited (HREPL)	Financing Amount:
Technology: Photovoltaic Solar Power Project with Multi Crystalline Silicon PV solar cells	Address/Contact: **Hindustan Cleanenergy Limited** 239, Okhla Industrial Estates, Phase III, New Delhi – 110020, India Tel: 011-47624100 Extn. 105 I (D)011-47624105 Fax: 011-47624229 Website: www.hindustanpowerprojects.com

C. Subject

☐ Environment	☐ Involuntary Resettlement	☒ Indigenous (Tribal) People

C. Categorization

☒ New ☐ Re-categorization — Previous Category

☐ Category A	☐ Category B	☒ Category C

D. Basis for Categorization/ Re-categorization (pls. attach documents):

[√] Checklist and Type of Check List: Indigenous Peoples Screening Checklist
[ ] Project and/or Site Description: _____
[ ] Other (e.g., due diligence): _____

E. Comments

Technical Team	ESSU Comments No indigenous people are present in the subproject area and none of the land purchased for the subproject belongs to the ST community. Hence, there is no issue of indigenous people has been identified under the subproject.

F. Approval

Proposed by:		**Endorsed by**:	
Technical Team Leader: M K Mohanty Date:  **Endorsed by**:		Head, ESSU: Khekiho Yeptho Date: 	
		Approved by (Optional):	**ADB Concurrence**
Director of Technical Date:		Compliance Officer (if different) Date:	

ENVIRONMENTAL SAFEGUARDS AUDIT REPORT

ENVIRONMENTAL AUDIT SAFEGUARDS REPORT

ON

Subproject: 20 MW Solar PV Power Project at Village Bopadar, Taluk Ranavav, District Porbandar, Gujarat State

Subproject Developer: M/s Hiraco Renewable Energy Private Limited

JANUARY 2016

Prepared by

ESSU, IREDA

3rd Floor, August Kranthi Bhavan, Bhikaji Cama Place
New Delhi 110 066

Sub Project: 20 MW Solar PV Power Project at Village Bopadar, Taluk Ranavav, District Porbandar, Gujarat State

EXECUTIVE SUMMARY

IREDA is a Public Limited Government Company established in 1987, under the administrative control of MNRE (Ministry of New and Renewable Energy), GoI to promote, develop and extend financial assistance for renewable energy and energy efficiency/ conservation projects. In line with its corporate objectives, IREDA is financing the 20 MW capacity solar power project (subproject) based on crystalline technology being developed in Gujarat State by M/s Hiraco Renewable Energy Private Limited.

Hiraco Renewable Energy Private Limited (HREPL) was incorporated on 4 November 2010 for construction and commissioning of 20 MW capacity solar power project in Village Bopadar, Taluk Ranavav, District Porbandar in the state of Gujarat, using crystalline technology. The construction of the subproject was commenced in September 2011 and commercial operations date(COD) was achieved on 18th April 2012. At present, the project is fully operational and functioning to its installed capacity and power is being evacuated to the grid as in accordance with its power purchase agreement with the Gujarat Urja Vikas Nigam Limited.

An environmental safeguards audit was conducted by ESSU (Environmental and Social Safeguards Cell) at IREDA to check and ensure subproject's compliance to the IREDA's ESMS agreed upon with ADB as well as ADB's Safeguards Policy Statement (SPS), 2009. The environmental safeguard audit of the subproject was undertaken during January 2016 with the following objectives:

- Identify the environmental safeguards concerns and environmental impacts due to subproject construction and operation
- Determine whether sub project actions comply with IREDA's ESMS agreed upon with ADB as well as ADB's Safeguards Policy Statement (SPS), 2009 and requirements;
- Prepare a CAP (corrective action plan), if any required, containing necessary remedial actions and ensure subproject's compliance to CAP during subsequent periodic safeguards audits

The audit comprised of visit to the sub project location, inspections/field assessments in and around the subproject, informal consultations with landowners and local community members; meetings with the developer's sub project in-charge at site as well as senior management at their corporate office, review of project documentation being maintained at subproject among others.

The environmental safeguard audit findings are hereunder;

- The subproject has been constructed over 118 acres of rain dependent single cropped agricultural land, which was devoid of any large trees and vegetative cover. The construction of subproject did not require felling of any trees. The subproject site is well connected to the National Highway through all-weather bituminous road and no new access roads were to be constructed specifically for subproject.

- The subproject is exempted from the prior environmental clearances from the Ministry of Environment, Forests and Climate Change, Government of India and outside the purview of EIA Notification.
- As the subproject is exempted from Environmental Clearances, developer has not commissioned any EIA studies as it is not warranted as a regulatory requirement. However, the subproject, has received the consent to establish (CTE) and Consent to Operate (CTO) from the State Pollution Control Board. The developer, as their corporate policy is committed to comply with IFC's Environmental, Health and Safety Guidelines and as required by IREDA for the subproject.
- The subproject has no National Park or Wildlife Sanctuary or ecologically sensitive areas or protected archeological or historical monuments within a radius of 10 km. The subproject construction did not impact any religious structures or worship places or places of importance/value to the local populace. The subproject site is not reported to be falling along the migrant route any threatened/protected wildlife. No perennial or seasonal rivers/streams flow within a region of 10 km radius surrounding the sub project site.
- As assessed during audit, construction of subproject has not involved any significant earth work excavation/filling or major construction activities, except to even out and level the ground for installing solar PV panels on prefabricated metallic frames.
- The developer has opted for manual mopping of panels through wet micro fibers for periodic cleaning of solar PV panels as a water conservation measure instead of hydrant and sprinkler network, which require comparatively more water.
- The developer has informed that since its commissioning in Jan 2013, there has been no health, safety issues or incidents at the project site. Periodic orientation to workforce is being provided on EHS issues. All the staff at subproject site are orally briefed about safety aspects and to avoid high voltage areas within the subproject premises.
- As the project has regulatory exemptions from both centre and state levels, developer has informed that no environmental monitoring (air and noise levels) has been carried out during construction as well as during present operation phase.
- The subproject does not discharge any toxic waste or liquid waste. The handling of the used batteries come under the purview of The Batteries (Management and Handling) Rules, 2001 and 2010 and thus either used batteries are taken away by the suppliers of new batteries or sold to recyclers authorized by the State Pollution Control Board.

CORRECTIVE ACTION PLAN

The environmental safeguards audit has indicated that at present the subproject is generally in compliance with the ESMS and no 'non-compliances' has been observed/recorded and thus no CAP (corrective action plan) has been warranted. However, the project developer has consented to earmark a budgetary provision for environmental management. The ESSU at IREDA shall ensure developer make budgetary provision and monitor implementation of the environmental management plan through developer's periodic progress reports. Further,

IREDA will undertake bi-annual due diligence visits through its ESSU to ensure satisfactory environmental safeguards compliance as per ESMS.

ENVIRONMENTAL SAFEGUARDS AUDIT REPORT

Sub Project: 20 MW Solar PV Power Project at Village Bopadar, Taluk Ranavav, District Porbandar, Gujarat State

1. PROJECT DESCRIPTION

In accordance with the Gujarat State Solar Energy Policy, 2009, M/s Hiraco Renewable Energy Private Limited (M/s HREPL) received allocation of 20 MW solar photovoltaic project against its application and the tariffs have been fixed as per the policy guidelines. M/s HREPL has been allocated under the second phase of Solar Power Policy – 2009 of the State of Gujarat.

M/s Hiraco Renewable Energy Private Limited is a SPV incorporated on 4th November 2010 by promoter company M/s Hindustan Clean Energy Limited to set up 20MW solar power project in Village Bopadar, Taluk Ranavav, District Porbandar in the state of Gujarat as per the allocation. Apart from this, the promoters have set up and commissioned 12 similar other solar power projects in Gujarat and elsewhere, with capacity ranging between 15-50MW.

IREDA is a Public Limited Government Company established in 1987, under the administrative control of MNRE (Ministry of New and Renewable Energy), GoI to promote, develop and extend financial assistance for renewable energy and energy efficiency/ conservation projects. In line with its corporate objectives, IREDA is financing the subproject based on crystalline technology being developed by M/s Hiraco Renewable Energy Private Limited.

The construction of the subproject was commenced in September 2011 and commercial operations date(COD) was achieved on 18th April 2012. At present, the project is fully operational and functioning to its installed capacity as per allocation. Normally, it takes about 6-8 months for construction and commissioning solar project of this capacity, as has been observed in other similar projects as well.

The solar power generated by the subproject is being evacuated through a 66 KV transmission line connected to GETCO Ranakandorna sub-station situated at a distance of 10 km from the subproject site. As the project is planned under the Solar Power Policy (2009) of the state of Gujarat, and as per the terms of Power Purchase Agreement, it is the responsibility of GETCO to arrange, provide and maintain the power evacuation and transmission from the 66 kV switchyard within the subproject

2. OBJECTIVE OF ENVIRONMENTAL SAFEGUARDS AUDIT

An environmental safeguards audit was conducted by ESSU (Environmental and Social Safeguards Cell) at IREDA to check and ensure subproject's compliance to the IREDA's ESMS agreed upon with ADB as well as ADB's Safeguards Policy Statement (SPS), 2009.

The environmental safeguard audit of the subproject was undertaken during January 2016 with the following objectives:

- Identify the environmental safeguards concerns and environmental impacts due to subproject construction and operation
- Determine whether sub project actions comply with IREDA's ESMS agreed upon with ADB as well as ADB's Safeguards Policy Statement (SPS), 2009 and requirements;
- Prepare a CAP (corrective action plan), if any required, containing necessary remedial actions and ensure subproject's compliance to CAP during subsequent periodic safeguards audits

3. AUDIT AND SITE INVESTIGATION PROCEDURE

The audit comprised of visit to the sub project location, inspections/field assessments in and around the subproject, informal consultations with landowners and local community members; meetings with the developer's sub project in-charge at site as well as senior management at their corporate office, review of project documentation being maintained at subproject among others.

4. APPLICABLE NATIONAL, LOCAL & OTHER ENVIRONMENTAL LAWS, REGULATIONS & STANDARDS

- As per the present regulatory framework, solar power projects do not require any prior environmental clearances either at the Centre or at the State level. The Schedule of EIA notification, 2006 does not include solar power projects and thus are out of the purview of this notification.
- Further, as per the re-categorization of industries notified by MOEF&CC in March 2016, solar power projects are now placed under white category, which are exempted from even seeking consent to establish(CTE) and consent to operate(CTO) from the State Pollution Control Board.
- Recently, since the project has been commissioned prior to re-categorization of industries notified by MoEF&CC, the subproject will require CTE and CTO from the State Pollution Control Board under the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981.
- As the land parcels required for subproject has been directly purchased from private land owners and does not involve any forest land, there is no requirement to obtain NOC from Forests and Environment, Department of Gujarat or required to seek any clearances under the Forest (Conservation) Act, 1980.
- Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 is applicable to ensure safety and welfare measures for workers employed at building and other construction sites. The subproject is covered under 'other construction' category.
- Since the subproject is more than 20 Km away from the airport and also does not involve construction of any structures, which involves height (limiting height is 150

meters within a distance of 20km from airport), the subproject will not require any height clearances from competent authorities.

5. AUDIT FINDINGS

5.1 Project Location & its Status

The subproject developer has constructed a 20 MW solar power project in Village Bopadar, Taluk Ranavav, District Porbandar in the state of Gujarat and same has been commissioned on 18th April, 2012. At present the subproject is under operation and power is being evacuated to the grid as in accordance with its power purchase agreement with the Gujarat Urja Vikas Nigam Limited.

The subproject site is connected to the National Highway through all-weather bituminous road. The nearest airport is at Porbandar, which is 35kms away from the subproject location. Since the subproject is more than 20 Km away from the airport and also does not involve construction of any structures, which involves height (limiting height is 150 meters within a distance of 20km from airport), the subproject will not require any height clearances from competent authorities.

The subproject, has received the consent to establish (CTE) and Consent to Operate (CTO) from the State Pollution Control Board with a validity of 5 years i.e. October 09, 2016.

5.2 Land Requirement

The subproject has been constructed over 118 acres of land, which was/is devoid of any large trees and vegetative cover. The 118 acres of land parcels largely constitute rain dependent single cropped agricultural lands. The lands have been directly purchased from the local people through a willing seller and willing buyer principle along with the consent of local panchayat.

5.3 National Park, Wildlife Sanctuary or Ecologically Sensitive Areas

The subproject has no National Park or Wildlife Sanctuary or ecologically sensitive areas within a radius of 10 km

5.4 Flora & Fauna

The subproject site is not reported to be falling along the migrant route any threatened/protected wildlife. Occurrence of rare, threatened and/or endangered (both flora and fauna) species has not been reported in and around the subproject area/region.

5.5 Archeological or Historical Monuments or Sensitive Areas

No archeological or historical monuments, protected by Archeological Survey of India or from the State Government have been reported in and around the sub project site as well as within a radius of 10 km. The subproject construction did not impact any religious structures or worship places or places of importance/value to the local populace.

5.6 Perennial or Seasonal Rivers

No perennial or seasonal rivers/streams flow within a region of 10 km radius surrounding the sub project site.

5.7 Project Impacts

The construction of subproject facility has not involved any significant earth work excavation/filling or major construction activities, except for marginal grading activities to even out and level the ground for installing solar PV panels on prefabricated metallic frames.

The limited site specific impacts like dust, noise, disposal of construction waste, on site sanitation facilities for construction force, have been reported to be handled through site specific mitigation measures and good engineering practices of the EPC contractor.

In order to conserve water, developer has opted for manual mopping of panels through wet micro fibers for periodic cleaning of solar PV panels instead of hydrant and sprinkler network, which require comparatively more water.

However, the cleaning groups deployed for mopping of solar panels are orally briefed about safety aspects and to avoid high voltage areas within the subproject premises.

However, Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 is applicable to ensure safety and welfare measures for workers employed at building and other construction sites. The subproject is covered under 'other construction' category.

Whenever some incident happens, required actions are taken at site and the matter is reported to their corporate office as part their regular reporting mechanism for the subproject.

The project is also subjected to Indian Electricity Regulations and has to confirm with respect to both safety and technical requirements, as part of testing and commissioning of subproject.

6. AUDIT CONCLUSIONS AND CORRECTIVE ACTION PLAN

The environmental safeguards audit has indicated that at present the subproject is generally in compliance with the ESMS and no 'non-compliances' has been observed/recorded. During the audit, the project developer has consented to earmark a budgetary provision for environmental management. As a CAP (Corrective action plan), the ESSU at IREDA shall ensure developer allocate required budgetary provisions and monitor implementation of the environmental management plan through developer's periodic progress reports. Further, IREDA will undertake bi-annual due diligence visits through its ESSU to ensure satisfactory environmental safeguards compliance as per ESMS.

Annexure 8

ADB Prohibited List of Activities

ATTACHMENT 1: ADB PROHIBITED INVESTMENT ACTIVITIES LIST (PIAL)

The following do not qualify for Asian Development Bank financing:

(i) production or activities involving harmful or exploitative forms of forced labor[10] or child labor;[11]

(ii) production of or trade in any product or activity deemed illegal under host country laws or regulations or international conventions and agreements or subject to international phaseouts or bans, such as (a) pharmaceuticals,[12] pesticides, and herbicides,[13] (b) ozone-depleting substances,[14] (c) polychlorinated biphenyls[15] and other hazardous chemicals,[16] (d) wildlife or wildlife products regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora,[17] and (e) transboundary trade in waste or waste products;[18]

(iii) production of or trade in weapons and munitions, including paramilitary materials;

(iv) production of or trade in alcoholic beverages, excluding beer and wine;[19]

(v) production of or trade in tobacco;[10]

(vi) gambling, casinos, and equivalent enterprises;[10]

(vii) production of or trade in radioactive materials,[20] including nuclear reactors and components thereof;

(viii) production of, trade in, or use of unbonded asbestos fibers;[21]

(ix) commercial logging operations or the purchase of logging equipment for use in primary tropical moist forests or old-growth forests; and

(x) marine and coastal fishing practices, such as large-scale pelagic drift net fishing and fine mesh net fishing, harmful to vulnerable and protected species in large numbers and damaging to marine biodiversity and habitats.

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[10] Forced labor means all work or services not voluntarily performed, that is, extracted from individuals under threat of force or penalty.

[11] Child labor means the employment of children whose age is below the host country's statutory minimum age of employment or employment of children in contravention of International Labor Organization Convention No. 138 "Minimum Age Convention" (www.ilo.org).

[12] A list of pharmaceutical products subject to phaseouts or bans is available at http://www.who.int.

[13] A list of pesticides and herbicides subject to phaseouts or bans is available at http://www.pic.int.

[14] A list of the chemical compounds that react with and deplete stratospheric ozone resulting in the widely publicized ozone holes is listed in the Montreal Protocol, together with target reduction and phaseout dates. Information is available at http://www.unep.org/ozone/montreal.shtml.

[15] A group of highly toxic chemicals, polychlorinated biphenyls are likely to be found in oil-filled electrical transformers, capacitors, and switchgear dating from 1950 to 1985.

[16] A list of hazardous chemicals is available at http://www.pic.int.

[17] A list is available at http://www.cites.org.

[18] As defined by the Basel Convention; see http://www.basel.int.

[19] This does not apply to subproject sponsors who are not substantially involved in these activities. Not substantially involved means that the activity concerned is ancillary to a subproject sponsor's primary operations.

[20] This does not apply to the purchase of medical equipment, quality control (measurement) equipment, and any equipment for which ADB considers the radioactive source to be trivial and adequately shielded.

[21] This does not apply to the purchase and use of bonded asbestos cement sheeting where the asbestos content is less than 20%.

Annexure 9

Mopping of Solar Panels

Photograph showing cleaning of PV panels

Annexure 10

The Battery (Management and handling) Rules, 2001 and 2010

MINISTRY OF ENVIRONMENT AND FORESTS

NOTIFICATION

New Delhi, the 16th May, 2001

Amended by notification S.O.1002(E), dated 4th May, 2010)

S.O. 432(E).- Whereas a notification of the Government of India in the Ministry of Environment and Forests was published in the Gazette of India, Extraordinary, Part II-section 3, sub-section (ii) vide No. S.O. 491(E), dated 24th May, 2000 and corrigendum published in the Gazette of India Extraordinary Part-II section 3, sub-section (ii) vide No. S.O. 593(E), dated 23rd June, 2000 under powers conferred by sections 6, 8 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), inviting objections from persons likely to be affected, within a period of sixty days from the date of publication of the said notification with regard to the Government's intention to notify the Battery (Management and Handling) Rules, 2000.

And, whereas all objections received have been duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sections 6, 8 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby notifies the Batteries (Management and Handling) Rules, 2001.

1. SHORT TITLE AND COMMENCEMENT. –

(1) These rules may be called the **Batteries (Management and Handling) Rules, 2001.**

(2) They shall come into force on the date of their publication in the Official Gazette.

2. APPLICATION. –

These rules shall apply to every manufacturer, importer, re-conditioner, assembler, dealer, recycler, auctioneer, consumer, and bulk consumer involved in manufacture, processing, sale, purchase and use of batteries or components thereof.

3. DEFINITIONS.- In these rules, unless the context otherwise requires, -

(a) **'Act'** means the Environment (Protection) Act, 1986 (29 of 1986);

(b) **'assembler'** - means a person who manufactures lead acid batteries by assembling various components;

(c) **'auction'** - means bulk sale of used lead acid batteries or component (s) thereof by invitation of tenders or auction, contract or negotiation by individual(s), companies or Government Departments;

(d) **'auctioneer'-** means a person(s) who auctions used lead acid batteries or components, thereof;

(e) **'battery'-** means lead acid battery which is a source of electrical energy and contains lead metal;

[1][(f) **'bulk consumer'** - means a consumer such as the Departments of Central Government like Railways, Defence, Telecom, Posts and Telegraph, the Departments of State Government, the Undertakings, Boards and other agencies or companies who purchase hundred or more than hundred batteries per annum.]

(g) **'components'** means lead bearing components of a lead acid battery;

(h) **'consumer'**- means a person using lead acid batteries excluding bulk consumers;

(i) **'dealer'-** means a person who sells and receives lead acid batteries or components thereof to and from the consumers or other dealers or retailers on behalf of the manufacturers, importers, assemblers and reconditioners or otherwise;

(j) **'designated collection centre'**- means a collection centre established, individually or jointly by one or more manufacturers or importers, assemblers and re-conditioners in pursuance of their responsibilities under rule- 4 of these rules.

(k) **'importer'** -means a person who imports new lead acid batteries or components containing lead thereof for the purpose of sale;

[1] Substituted by the S.O.1002(E), dated 4.5.2010.

(l) **'manufacturer'-** in relation to any factory manufacturing lead acid batteries or components thereof means a person or Chief Executive Officer (CEO) of the company who has control over the affairs of the factory or the premises for sale and collection of lead acid batteries or components thereof,

(m) **'original equipment manufacturer'** - means manufacturer of equipment or product using lead acid batteries as a component;

(n) **'reconditioner'** -means a person involved in repairing of lead acid batteries for selling the same in the market;

(o) **'recycler'**-means an occupier who processes used lead acid batteries or components thereof for recovering lead;

(p) **'registered recycler'-** means a recycler registered with the Ministry of Environment and Forests or an agency designated by it for reprocessing used lead acid batteries or components thereof;

(q) **'State Board'**- means the concerned State Pollution Control Board or the Pollution Control Committee as the case may be;

(r) **'used batteries'** - means used, damaged and old lead acid batteries or components thereof; and

(s) the words not defined in these rules will have the same meaning as defined in the Environment (Protection) Act, 1986 and the rules framed thereunder.

4. RESPONSIBILITIES OF MANUFACTURER, IMPORTER, ASSEMBLER AND RE-CONDITIONER.-

It shall be the responsibility of a manufacturer, importer, assembler and re-conditioner to

(i) ensure that the used batteries are collected back as per the Schedule against new batteries sold excluding those sold to original equipment manufacturer and bulk consumer(s);

(ii) ensure that used batteries collected back are of similar type and specifications as that of the new batteries sold;

(iii) file a half-yearly return of their sales and buy-back to the State Board in Form- I latest by 30th June and 31st December of every year.

(iv) set up collection centres either individually or jointly at various places for collection of used batteries from consumers or dealers;

(v) ensure that used batteries collected are sent only to the registered recyclers,

(vi) ensure that necessary arrangements are made with dealers for safe transportation from collection centres to the premises of registered recyclers ;

(vii) ensure that no damage to the environment occurs during transportation;

(viii) create public awareness through advertisements, publications, posters or by other means with regard to the following:

(a) hazards of lead;
(b) responsibility of consumers to return their used batteries only to the dealers or deliver at designated collection centres; and
(c) addresses of dealers and designated collection centres.

(ix) use the international recycling sign on the Batteries;

(x) buy recycled lead only from registered recyclers; and

(xi) bring to the notice of the State Board or the Ministry of Environment and Forests any violation by the dealers.

[2][(xii) ensure that the new batteries shall be sold only to the registered dealers.]

Note: The assemblers and reconditioners are excluded from the purview of responsibilities as specified in sub-clauses (iv), (vii), (ix) and (xii).

[2] Inserted by the S.O.1002(E), dated 4.5.2010.

5. REGISTRATION OF IMPORTERS. –

[3][(i) the importers shall get registered as per Form I with the Central Pollution Control Board for a period of five years and a provision of cancellation for failure in collection of the required number of used batteries as per the said rules, non-submission of timely half yearly returns to the State Pollution Control Boards with a copy to the Central Pollution Control Board, renewal of the registration shall be as per the compliance status:
Provided that the registration granted to the importer shall not be cancelled unless he has been given a reasonable opportunity of hearing;

(ii) an appeal shall lie against any order of suspension or cancellation or refusal of registration passed by the Member-Secretary of the Central Pollution Control Board or any other officer designated by the Central Pollution Control Board;

(iii) the appeal shall be in writing and shall be accompanied with a copy of the order appealed against and shall be made within period of thirty days from the date of passing of the order.]

6. CUSTOMS CLEARANCE OF IMPORTS OF NEW LEAD ACID BATTERIES. –

Customs clearance of imports shall be contingent upon

(i) valid registration with the Reserve Bank of India (with Importer's Code Number);

(ii) one time registration with the Ministry of Environment and Forests or an agency designated by it in Form-II;

(iii) undertaking in Form-III; and

(iv) a copy of the latest half-yearly return in Form-IV.

7. RESPONSIBILITIES OF DEALER.–

It shall be the responsibility of a dealer to –

(i) ensure that the used batteries are collected back as per the Schedule against new batteries sold;

(ii) give appropriate discount for every used battery returned by the consumer;

(iii) ensure that used batteries collected back are of similar type and specifications as that of the new batteries sold;

(iv) file half-yearly returns of the sale of new batteries and buy-back of old batteries to the manufacturer in Form V by 31st May and 30th November of every year;

(v) ensure safe transportation of collected batteries to the designated collection centres or to the registered recyclers; and

(vi) ensure that no damage is caused to the environment during storage and transportation of used batteries.

[4][(vii) (a) registration with State Pollution Control Board for five years and a provision of cancellation for failure in collection of the required number of used batteries as per the said rules, non-submission of timely half yearly returns to the State Pollution Control Boards, renewal of the registration shall be as per the compliance status, to submit details as per Form IV, registration would be considered as deemed registered if not objected to within thirty days;

(b) an appeal shall lie against any order of suspension or cancellation or refusal of registration passed by the Member-Secretary of the State Pollution Control Board or any other officer designated by the State Pollution Control Board;

(c) the appeal shall be in writing and shall be accompanied with a copy of the order appealed against and shall be made within period of thirty days from the date of passing of the order.]

[3] Substituted by the S.O.1002(E), dated 4.5.2010.
[4] Inserted by the S.O.1002(E), dated 4.5.2010.

8. RESPONSIBILITIES OF RECYCLER. –

Each recycler shall -

(i) apply for registration to the Ministry of Environment and Forests or an agency designated by it if not applied already, by submitting information in Form VI;

(ii) ensure strict compliance of the terms and conditions of registration, however, those already registered with the Ministry of Environment and Forests or an agency designated by it for reprocessing used batteries would be bound by the terms and conditions of such registration;

(iii) submit annual returns as per Form VII to the State Board;

[5][(iv) make available all records relating to receipt of used batteries, sources, quantities and metal yield to be submitted to the State Pollution Control Board for inspection.]

(v) Mark 'Recycled' on lead recovered by reprocessing; and

(vi) Create public awareness through advertisements, publications, posters or others with regard to the following-
(a) hazards of lead; and
(b) obligation of consumers to return used batteries only to the registered dealers or deliver at the designated collection centres.

9. PROCEDURE FOR REGISTRATION/RENEWAL OF REGISTRATION OF RECYCLERS. –

(1) Every recycler of used lead acid batteries shall make an application in Form VI along with the following documents to the Joint Secretary, Ministry of Environment and Forests or any officer designated by the Ministry or an agency designated by it for grant of registration or renewal;

(a) a copy of the valid consents under Water (Prevention and Control of Pollution) Act, 1974, as amended and Air (Prevention and Control of Pollution) Act, 1981, as amended;

(b) a copy of the valid authorization under Hazardous Wastes (Management and Handling) Rules, 1989 as amended;

(c) a copy of valid certificate of registration with District Industries Centre; and

(d) a copy of the proof of installed capacity issued by either State Pollution Control Board/District Industries Centre.

(2) The Joint Secretary, Ministry of Environment and Forests or any officer designated by the Ministry or an agency designated by it shall ensure that the recyclers possess appropriate facilities, technical capabilities, and equipment to recycle used batteries and dispose of hazardous waste generated;

(3) The Joint Secretary , Ministry of Environment and Forests or any officer designated by the Ministry or an agency designated by it shall take decision on application for registration within [6][90] days of receipt of application form with complete details;

(4) The registration granted under this rule shall be in force for a period of two years from the date of issue or from the date of renewal unless suspended or cancelled earlier;

(5) An application for the renewal of registration shall be made in Form VI atleast six months before its expiry. The Joint Secretary, Ministry of Environment and Forests or any officer designated by the Ministry or an agency designated by it shall renew the registration of the recycler granted under sub rule(4) of this rule, after examining each case on merit;

(6) The Joint Secretary, Ministry of Environment and Forests or any officer designated by the Ministry or an agency designated by it may, after giving reasonable opportunity to the applicant of being heard, refuse to grant registration;

(7) The Joint Secretary, Ministry of Environment and Forests or any officer designated by the Ministry or an agency designated by it may cancel or suspend a registration issued under these rules, if in his/her opinion, the registered recycler has failed to comply with any of the conditions of registration, or with any provisions of the Act or rules made thereunder after giving him an opportunity to explain and after recording the reasons therefor;

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[5] Substituted by the S.O.1002(E), dated 4.5.2010.

[6] Substituted by the S.O.1002(E), dated 4.5.2010.

(8) It shall be the responsibility of the State Boards to monitor the compliance of conditions prescribed while according registration, and

(9) An appeal shall lie against any order of suspension or cancellation or refusal of registration passed by the Joint Secretary to the Ministry of Environment and Forests or any officer designated by the Ministry or agency designated by it. The appeal shall be in writing and shall be accompanied with a copy of the order appealed against and shall be presented within 30 days of passing of the order.

10. RESPONSIBILITIES OF CONSUMER OR BULK CONSUMER.-

(1) It shall be the responsibility of the consumer to ensure that used batteries are not disposed of in any manner other than depositing with the dealer, manufacturer, importer, assembler, registered recycler, re-conditioner or at the designated collection centres.

(2) It shall be the responsibility of the bulk consumer to –

(i) ensure that used batteries are not disposed of in any manner other than by depositing with the dealer/manufacturer/registered recycler/importer/ re-conditioner or at the designated collection centers,- and
(ii) file half-yearly return in Form VIII to the State Board .

(3) Bulk consumers or their user units may auction used batteries to registered recyclers only.

11. RESPONSIBILITIES OF AUCTIONEER.-

The auctioneer shall -

(i) ensure that used batteries are auctioned to the registered recyclers only-,

(ii) file half-yearly returns of their auctions to the State Boards in Form-IX; and

(iii) maintain a record of such auctions and make these records available to the State Board for inspection.

12. PRESCRIBED AUTHORITY.–

The prescribed authority for ensuring compliance of the provisions of these rules shall be the State Board. And, it shall file an annual compliance status report to the Central Pollution Control Board by 30th April of every year.

13. DUTIES OF CENTRAL POLLUTION CONTROL BOARD.-

The Central Pollution Control Board shall compile and publish the data received every year from the State Boards. It shall review the compliance of the rules periodically to improve the collection and recycling of used lead batteries and apprise the Ministry of Environment and Forests, Government of India.

14. COMPUTERISATION OF RECORDS AND RETURNS.–

Ministry of Environment and Forests or an agency designated by it shall develop a system for computerized tracking of-

(i) distribution and sale of batteries;

(ii) collection, auction, transport and re-processing of used batteries;

(iii) sale of re-processed lead by registered recyclers; and

(iv) sale of lead from all domestic producers or importers.

SCHEDULE

[See rule 4(i) and 7(i)]

Sl. No.	Year	Number of used batteries to be collected back
(i)	During first year of implementation of rules	50% of new batteries sold
(ii)	During second year of implementation of rules	75% of new batteries sold
(iii)	After second year of implementation of rules	90% of new batteries sold

FORM – I

[See rule 4(iii)]

FORM FOR FILING RETUNS OF SALE OF NEW BATTERIES AND COLLECTION OF USED BATTERIES

[To be submitted by [7][manufacturer/importer/bulk consumer] by 30th June (for the period October-March) and 31st December (for the period April-September) every year]

[8][1.	Name and Address of the manufacturer /importer/bulk consumer]	
2.	Name of the authorised person and complete address with telephone and fax numbers	
3.	Total number of new batteries sold [9][importers or consumers] during the period October-March/April-September in respect of the following categories Category (i) Automative (a) Four Wheeler (b) Two Wheeler (ii) Industrial (a) UPS (b) Motive power (c) Stand-by (iii) Others (inverters, etc.) Number of batteries sold to (i) dealers (ii) bulk consumers (iii) OEM (iv) Any other party for replacement should be indicated separately	(i) No. of Batteries (ii) Approximate weight (in Metric Tones)
4.	Name and full address of the designated collection centres	
5.	Total number of used batteries of different categories as at Sl. No.3 collected and sent to the registered recyclers*	

* enclose the list of recyclers to who batteries have been sent for recycling.

Place _____

Date _____ Signature of the authorised person

FORM – II

[See rule 5 & 6(ii)]

FORM FOR REGISTRATION OF IMPORTER OF NEW LEAD ACID BATTERIES / PRIMARY LEAD

[To be submitted in triplicate to the Ministry of Environment and Forests]

1.	Name and Address of the importer	
2.	Import / Export Licence No.	
3.	Name of person / owner / occupier as the case may be	

Date _____ Signature of the Importer

Place_____

[7] Substituted by the S.O.1002(E), dated 4.5.2010.

[8] Substituted by the S.O.1002(E), dated 4.5.2010.

[9] Inserted by the S.O.1002(E), dated 4.5.2010.

FORM – III

[see rule 6(iii)]

(to be submitted by importer of new lead acid batteries)

UNDERTAKING

To

The Member Secretary
State Pollution Control Board

1. I_____ of M/s _____ hereby submit that I am in the process of importing _____ (MT) of new lead acid batteries.

2. I undertake that I shall collect back the used batteries as per the schedule prescribed by the Government from time to time in lieu of the new batteries imported and sold, and shall send these only to the registered recyclers. I further undertake that I shall submit half-yearly returns as per item (iii) of rule 6 to the State Board and abide by their directions, if any

Date :
Place : Signature of the Importer

Copy to : The concerned Customs Authority

[10][FORM – IV

[See Rules 4 and 7 (vii)]

FORM FOR REGISTRATION OF DEALERS

[To be submitted by dealers to the State Pollution Control Boards/Pollution Control Committees]

1.	Name and address of the dealers with telephone and fax numbers	
2.	TIN / VAT number*	

* IF APPLICABLE (AS PER CURRENT STATE SALE TAX RULES, MANDATORY TIN/VAT NUMBER IS REQUIRED ONLY IF THE ANNUAL TURNOVER OF THE DEALER IS MORE THAN THE PRESCRIBED VALUE)

Signature of the authorised person

Place_____
Date_____

Note:- The principal rules were published in the Gazette of India, Extraordinary *vide* notification number S.O.432(E), dated the 16th May, 2001.

[10] Substituted by the S.O.1002(E), dated 4.5.2010.

FORM – V

[See rule 7(iv)]

FORM FOR FILING RETUNS OF SALE OF NEW BATTERIES AND COLLECTION OF OLD BATTERIES

[To be submitted by dealers to the manufacturers by 31st May (for sale during October-March) and 30th November (for sale during April-September) every year]

1.	Name and address of the dealer	
2.	Name of the authorised person and complete address with telephone and fax numbers	
3.	Number of new batteries sold during the period October-March/April-September in respect of the following categories; Category (i) Automative (a) Four Wheeler (b) Two Wheeler (ii) Industrial (a) UPS (b) Motive power (c) Stand-by (iii) Others Number of batteries sold (i) As replacement of used Batteries (ii) to bulk consumers (iii) to OEM (iv) to any other party	(i) No. of Batteries (ii) Approximate weight (in Metric Tones)
4.	Total number of used batteries of different categories as at Sl. No.3 collected and sent to registered recyclers */designated collection centres / manufacturers	

* enclose the list of recyclers to who batteries have been sent for recycling.

Place_____
Date_____ Signature of the authorised person

FORM – VI

[see rule 8(i), 9(1) & 9(5)]

FORM FOR APPLICATION FOR REGISTRATION OF FACILITIES POSSESSING ENVIRNMENTALLY SOUND MANAGEMENT PRACTIVE FOR RECYCLING OF USED LEAD ACID BATTERIES

(To be submitted in triplicate)

1.	Name and Address of the unit			
2.	Contact person with designation, Tel./Fax			
3.	Date of Commissioning			
4.	No. of Workers (including contract labourers)			
5.	Consent Validity	a) Under Air Act, 1981; Valid up to – b) Under Water Act, 1974; Valid up to -		
6.	Validity of Authorisation under rule 5 of the Hazardous Wastes (Management and Handling) Rules, 1989	Valid up to -		
7.	Installed capacity of production in (MTA)			
8.	Products manufactured Name : (a) (b) (c)	Year –1	Year-2	Year-3
9.	Raw material consumed (Tones/year) Name : (a) (b) (c)	Year –1	Year-2	Year-3
10.	Manufacturing Process	Please attach manufacturing process flow diagram for each product(s)		
11.	Water consumption	Industrial - m^3/day Domestic - m^3/day		
12.	Water Cess paid up to			
13.	Waste water generation a) as per consent m^3/day b) actual m^3 /day (average of last three months)	Industrial - Domestic -		
14.	Waste water treatment (please provide flow diagram of the treatment scheme)	Industrial - Domestic -		
15.	Waste water discharge	Quantity m^3/day Location- Analysis of treated waste water – PH_2, BOD,COD, SS, O&G, Any other (indicate the corresponding standards applicable)		
16.	Air Pollution Control a. Please provide flow diagram for emission control system(s) installed for each process unit, utilities etc. b. Details for facilities provided for control of fugitive emission due to material handling, process, utilities etc. c. Fuel consumption d. Stack emission monitoring results vis-à-vis the standards applicable e. Ambient air quality	S.No. Name of Fuel Quantity / day S.No Stack attached to Emission g/Nm^3 S.No Location Results ug/m^3		
17.	Hazardous Waste Management a) Waste generation b) Details of collection, treatment c) Disposal (including point of final discharge) (i) Please provide details of the disposal facility (ii) Whether facilities provided are in compliance of the conditions issued by the SPCB in Authorization (iii) Please attach analysis report of characterization of hazardous waste generated (including leachate test if applicable)	S.No Name of Process Quantity / y Waste category		

9

18.	Details of waste proposed to be taken in auction or import, as the case may be, for use as raw material	1. Name - 2. Quantity required /- 3. Position in List A/List as per Basel Convention (BC) – 4. Nature as per Annexure III of BC
19.	Occupational safety and health aspects	Please provide details of facilities provided.
20.	Remarks (i) Whether industry has provided adequate pollution control system / equipment to meet the standards of emission / effluent. (ii) Whether industry is in compliance with conditions laid down in the Hazardous Waste Authorization (iii) Whether Hazardous Waste collection and Treatment, Storage and Disposal Facility (TSDF) are operating satisfactorily. (iv) Whether conditions exist or likely to exists of the material being handled / processed of posing immediate or delayed adverse impacts on the environment. (v) Whether conditions exist or is likely to exist of the material being handled / processed by any means capable of yielding another material e.g., leachate which may possess eco-toxicity.	Yes/No If Yes, please furnish details Yes / No Yes / No Yes / No Yes / No
21.	(i) Cost of the unit (ii) Cost of pollution control equipment including environmental safeguard measures a) Capital : b) Recurring :	
22	Any Other Information : i) ii) iii)	

I hereby declare that the above statements/informations are true and correct to the best of my knowledge and belief.

Date :
Place: Signature Name Designation

FORM – VII

[see rule 8(iii)]

FORM FOR FILING RETURNS BY RECYCLERS OF USED BATTERIES

[To be submitted by recyclers by 30th June and 31st December of every year]

1.	Name and address of the recycler	
2.	Name of the Authorised person and full address with telephone and fax number	
3.	Installed annual capacity to recycle used battery scrap (in MTA)	
4.	Total quantity of used battery scrap purchased from/sent for processing during the period from October – March / April-September	(i) Quantity of used batteries sent by/purchased from the manufacturers (ii) Quantity of used batteries purchased from the dealers (iii) Quantity of used batteries purchased from auctioneers (iv) Quantity of used batteries obtained from any other source -
5.	Quantity of lead recovered from the used battery scrap (in MTA)	
6.	Quantity of recycled lead sent back to	(i) the manufacturer of batteries (ii) other agencies * -

* enclose list of other agencies.

Place _____ Signature of the authorised person
Date _____

FORM – VIII

[see rule 10 (2)(ii)]

FORM FOR FILING RETURNS FOR BULK CONSUMER OF BATTERIES

[To be submitted by the bulk consumer to the State Board by 30th June (for the period October-March) and 31st December (for the period April-September) every year]

1.	Name and address of the bulk consumer	
2.	Name of the Authorised person and full address with telephone and fax number	
3.	Number of new batteries of different categories purchased from the manufacturer/importer/dealer or any other agency during October-March and April-September Category (i) Automative (a) Four wheelers (b) Two wheelers (ii) Industrial (a) UPS (b) Motive power (c) Stand-by (iii) Others	(i) No. of Batteries (ii) Approximate weight (in Metric Tonnes)
4.	Number or used batteries of categories mentioned in Sl. No. 3 and Tonnage of scrap sent to manufacturer/dealer /importer/registered recycler/or any other agency to whom the used batteries scrap was sent*.	

* Enclose list of manufacture/dealer/importer/registered recyclers/or any other agency to whom the used batteries scrap was sent.

Place _____ Signature of the authorised person
Date _____

FORM – IX

[see rule 11 (ii)]

FORM FOR FILING RETURNS BY AUCTIONEER OF USED BATTERIES

[To be submitted by the auctioneer to State Board by 30th June and 31st December of every year]

1.	Name and address of the auctioneer	
2.	Name of the Authorised person and full address with telephone and fax number	
3.	Number of used batteries and total Tonnage (of MT) available during the period from October-March and April-September	
4.	Sources of the used battery scrap	
5.	Number of used batteries and total Tonnage (of MT) auctioned during the period from October-March and April-September	
6.	Number of used batteries and total Tonnage of (MT) sent to the registered recyclers *	

* enclose a list.

Place _____
Date _____ Signature of the authorized Person

Annexure 11

Sample Sale Deed

INDIA NON JUDICIAL

Government of Gujarat

Certificate of Stamp Duty

सत्यमेव जयते

2239/2

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Certificate No.	:	IN-GJ17640141509387J
Certificate Issued Date	:	12-May-2011 01:38 PM
Account Reference	:	NONACC (FI)/ gjevlpl10/ ~~RANAVAV/ GJ-PB~~
Unique Doc. Reference	:	SUBIN-GJGJEVLPL1019153105576606J
Purchased by	:	HIRACO RENEWABLE ENERGY PVT LTD
Description of Document	:	Article 20(a) Conveyance - Immovable Property
Property Description	:	GAM BAPODAR NA SR.NO. 148/1 NI 19727 SQ.MTS.
Consideration Price (Rs.)	:	28,00,250 (Twenty Eight Lakh Two Hundred And Fifty only)
First Party	:	BAPODARA BHANUBHAI AALABHAI
Second Party	:	HIRACO RENEWABLE ENERGY PVT LTD
Stamp Duty Paid By	:	HIRACO RENEWABLE ENERGY PVT LTD
Stamp Duty Amount(Rs.)	:	1,37,400 (One Lakh Thirty Seven Thousand Four Hundred only)

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SALE DEED

THIS SALE DEED (the "SALE DEED") IS MADE AND EXECUTED at PORBANDAR ON THIS 12th DAY OF ~~APRIL~~ MAY, 2011 BETWEEN:

Shri BAPODARA BHANUBHAI AALABHAI

(Form No. 60)

Aged about 39 Years, Occupation: Agriculture, Religion: Hindu, Residing at Village Bapodar, Ta. Ranavav, Dist: Porbandar. (hereinafter referred to as **"Seller"**, which expression shall, unless repugnant or inconsistent to the meaning hereof, be deemed to include his heirs, successors-in-interest, nominees and permitted assigns);

Gujarati Majoority

joshi Sir.

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TO AND IN FAVOUR OF

HIRACO RENEWABLE ENERGY PRIVATE LIMITED,
(PAN: A A C C H 5 2 8 1 M)
a company incorporated under the Companies Act, 1956, having its registered office at 401, Swamini Complex, Opp. Drive-In-Cinema, Drive-In Road, Bodakdev, Ahmedabad-380054,Gujarat, represented by its authorized signatory Mr. R. P. Tiwari, duly authorized vide board resolution dated 07.04.2011 (hereinafter referred as the **"Purchaser"**) of the Second Part;

AND

Shri JAYESHBHAI VINODRAY JOSHI,
(PAN: A C C P J 3 2 0 1 G)
Aged about 48 Years, Occupation: Business, Religion: Hindu, Residing at 401, Crown Appartment, Sharu Section Road, JAMNAGAR.. (hereinafter referred to as **"Confirming Party"**, which expression shall, unless repugnant or inconsistent to the meaning hereof, be deemed to include his heirs, successors-in-interest, nominees and permitted assigns);

The expressions 'SELLERS', 'Confirming Party' and 'Purchaser' shall unless repugnant to the subject or context thereof mean and include, their respective successors, successors in interest, nominees and permitted assigns.

WHEREAS, the SELLERS are the absolute owners and are in possession of the property being agricultural lands admeasuring an extent of **19727 Sq. Metres** i.e. 4.874 Acres i.e. 12.19 Vigha, being **Survey No. 148/1** (Khed Khata No. 575) situated in Village **BAPODAR**, Taluka Ranavav, District Porbandar, along with all rights, title and interest, easements, privileges and appurtenances thereto more fully described in the Schedule hereunder and hereinafter referred to as **"Scheduled Property"**. having acquired By Family Partition North Side to Bapodara Bhanubhai Aalabhai and Bapodara Rupiben Aalabhai as per Revenue Entry No. 2602 in Village Form No. 6 and 7/12.

AND WHEREAS, The SELLERS due to urgent legal necessities in the interest & consent of rest of the family members have decided to dispose of the Scheduled Property for valuable consideration.

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AND WHEREAS, the SELLER has agreed to sell Scheduled Property to the Confirming Party and Confirming Party has agreed to sell the Scheduled Land to the Purchaser. The SELLER has Agreed to Sell the Schedule Property to the Confirming Party for the total consideration of Rs. 24,98,950/- (Rupees Twenty Four Lac Ninety Eight Thousand Nine Hundred Fifty Only) and Confirming Party has Agreed to Sell the said Schedule Property to the Purchaser for a total consideration of Rs. 28,00,250/- (Rupees Twenty Eight Lac Two Hundred Fifty Only). And on the representation of the Confirming Party & the SELLER, the Purchaser has agreed to purchase the said Scheduled Property from the SELLER along with Confirming Party.

AND WHERAS, the Purchaser has paid to the SELLER & Confirming Party and the SELLER & Confirming Party has received the total consideration as under:

Rs. 2,00,000/- Rupees Two Lac Only paid to Seller by the Confirming Party by CASH at Village Bapodar, as advance in respect of the said land, the receipt whereof is being acknowledged by the Seller.

Rs. 22,98,950/- Rupees Twenty Two Lac Ninety Eight Thousand Nine Hundred Fifty Only paid to Seller by Purchaser vide Pay Slip No. 001056 drawn on Axis Bank Ltd., payable at Porbandar Dated 15-04-2011 in the named of Seller as balance consideration of the said land, the receipt whereof is being acknowledged by the Seller.

Rs. 3,01,300/- Rupees Three Lac One Thousand Three Hundred Only paid to Confirming Party by the Purchaser.
The Purchaser had paid Ch.No. 001977, drawn on Axis Bank Ltd. Lajpatnagar, New Delhi Branch, and adjusted Rs.5,01,300/- Rupees Five Lac One Thousand Three Hundred Only against the same cheque given to Confirming Party by the Purchaser, So the amount had been received by the Confirming Party. Out of the above amount of Rs.5,01,300/- Rupees Five Lac One Thousand Three Hundred Only the Confirming Party had paid Rs. 2,00,000/- Rupees Two Lac Only as consideration paid

Joshi.

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earlier to Seller and Rs. 3,01,300/- Rupees Three Lac One Thousand Three Hundred Only as Profit of the Confirming Party for the said land, the receipt whereof is being acknowledged by the Seller and Confirming Party.

Rs. 28,00,250/- Total Sale Consideration amount is Rupees Twenty Eight Lac Two Hundred Fifty Only.

Thus, we the SELLER & the Confirming Party have received the entire sale consideration from the purchaser and both hereby acknowledge the receipt. Now nothing remains outstanding towards the sale consideration from the purchaser of Scheduled Property.

NOW THIS SALE DEED WITNESSETH AS UNDER:

That having received the said consideration amount in the manner detailed herein above the Seller doth hereby sell, convey and assign absolutely to the Purchaser the said land and all that it has including all rights of easement and appurtenances attached thereto **TO HOLD** and **POSSESS** the same unto and use and enjoy the same as absolute owner thereof.

1. The SELLERS represent and warrant as follows:

a) The SELLERS have absolute right, title and interest so as to convey the same in favour of the Purchaser in the manner set forth in this Sale Deed and their title to the Schedule Property is valid, good, marketable and subsisting and free from all encumbrances and claims including all claims by way of Sale, minor's Claims, exchange, mortgage, gift, inheritance, trust possession, easement, lien or otherwise and that none else have any right, title, interest or share therein.

b) The SELLERS declare that apart from them, there is no other person interested in the Scheduled property or portions thereof and the SELLERS shall indemnify and keep the Purchaser indemnified from or against any losses the Purchaser may suffer consequent to the breach of the terms hereof of this Sale.

c) The SELLERS also declare that the Scheduled Property is free from all encumbrances, Court attachments, litigations and other charges including but

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not limited to mortgage or lien and that it is not restrained by any court of law or authorities from alienating the same in any manner whatsoever.

d) The SELLERS declare that they or their representatives, agents, servants and/or any one claiming through or under them have not subjected the Scheduled property to any commitment in favour of any other person or institution other than the Purchaser herein and undertake to indemnify and keep indemnified the Purchaser from any loss or damage arising there from. The SELLERS further declare that the Scheduled Property is not subjected to any acquisition or requisition from the Government or from any other Statutory Authorities under the provisions of any Act and is free from all such proceedings.

e) The SELLERS do not have any pending liabilities with regard to income tax, wealth tax, gift tax, property tax or/and any other tax, which could affect the title of the Scheduled property.

f) There are no easements, quasi–easements, restrictive covenants or other rights or servitudes over the Scheduled Property.

g) The SELLERS do not hold land in excess of the Ceiling Limit.

h) There are no tenancy claims with regard to the Scheduled Property and that no order has been passed to that effect by any Tribunal.

i) The Scheduled Property is not Inam Land/ New Tenancy Land.

j) The SELLERS ensure and covenant that the Purchaser will in no way be restrained in any manner whatsoever from getting the Scheduled Property converted into non agricultural use as per the statutory provisions.

2. The SELLERS hereby undertake to execute or cause to be executed all further documents, deeds or indentures that may reasonably be required, at the request and cost of the Purchaser in order to more perfectly assure the title of the Schedule properties in its favour.

3. The SELLERS hereby undertake to indemnify the Purchaser against all losses or damages that it may incur or suffer due to any defect in the title of the SELLERS over the whole or any portion of the Schedule Properties or due to any claims that may be put up by the SELLERS or their successors - in- interest or

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any other person or due to any unnoticed encumbrance or litigation over the whole or any portion of the Schedule Properties.

4. The SELLERS have paid up-to-date land tax, property taxes and all other taxes, cesses and charges in respect of the Schedule Properties to the appropriate department and the Purchaser is entitled to pay the same hereinafter from this day onwards and in case any taxes or charges are still unpaid in respect of the Schedule Properties that are payable prior to the execution of this Sale Deed, the same shall be paid by the SELLERS and they shall indemnify the Purchaser on this account.

5. The SELLERS have this day put the Purchaser in juridical and physical vacant possession of the Schedule Properties and declare that hereafter they have no manner of right, title, interest or claim against the Purchaser herein and on the Schedule Properties sold and conveyed to the Purchaser under this Sale Deed.

6. The SELLERS do hereby covenant and assure that the Purchaser is entitled to have mutation of its name in all public records and local bodies. The SELLERS have no objection for the Purchaser to get the Patta and other Revenue records of the Schedule Properties transferred to its name in the office of the concerned Revenue authority by virtue of this Sale deed.

7. As per the understanding with the Government of Gujarat, the Purchaser is purchasing the Said Land for setting up Solar Power Project i.e. Bonafied Industrial Use. However as per Section 55 of The Saurashtra Gharkhed, Tenancy Settlement And Agricultural Land Ordinance – 1949, the required permission shall be taken within the stipulated time.

8. Stamp duty and Registration charges shall be borne by the Purchaser.

SCHEDULE OF LAND

An agricultural land bearing **Survey No. 148/1 area about 19727 Sq. Metres** (i.e. 4.874 Acres) (Khed Khata No. 575), situate in the Village **BAPODAR**, Taluka Ranavav, District Porbandar, having boundaries are as under:

EAST : Land of Survey No. 148/1 Paiki 1

WEST : Land of Survey No. 149

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NORTH : Land of Survey No. 148/2

SOUTH : Land of Survey No. 150

IN WITNESS WHEREOF THE PARTIES HERETO HAVE SIGNED AND EXECUTED THIS SALE DEED ON THE DAY, MONTH AND YEAR FIRST ABOVE WRITTEN

SELLERS

PURCHASER

Authorized Signatory

CONFIRMING PARTY

WITNESSES:

1.

2.

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SCHEDULE OF THE PHOTOGRAPH OF LAND

Photograph of land bearing **Survey No. 148/1** in the Village **BAPODAR**, Taluka Ranavav, District Porbandar.

SELLER:

Shri BAPODARA BHANUBHAI AALABHAI

PURCHASER :

HIRACO RENEWABLE ENERGY PRIVATE LIMITED,
through its authorized signatory Mr. R. P. Tiwari

CONFIRMING PARTY:

Shri JAYESHBHAI VINODRAY JOSHI

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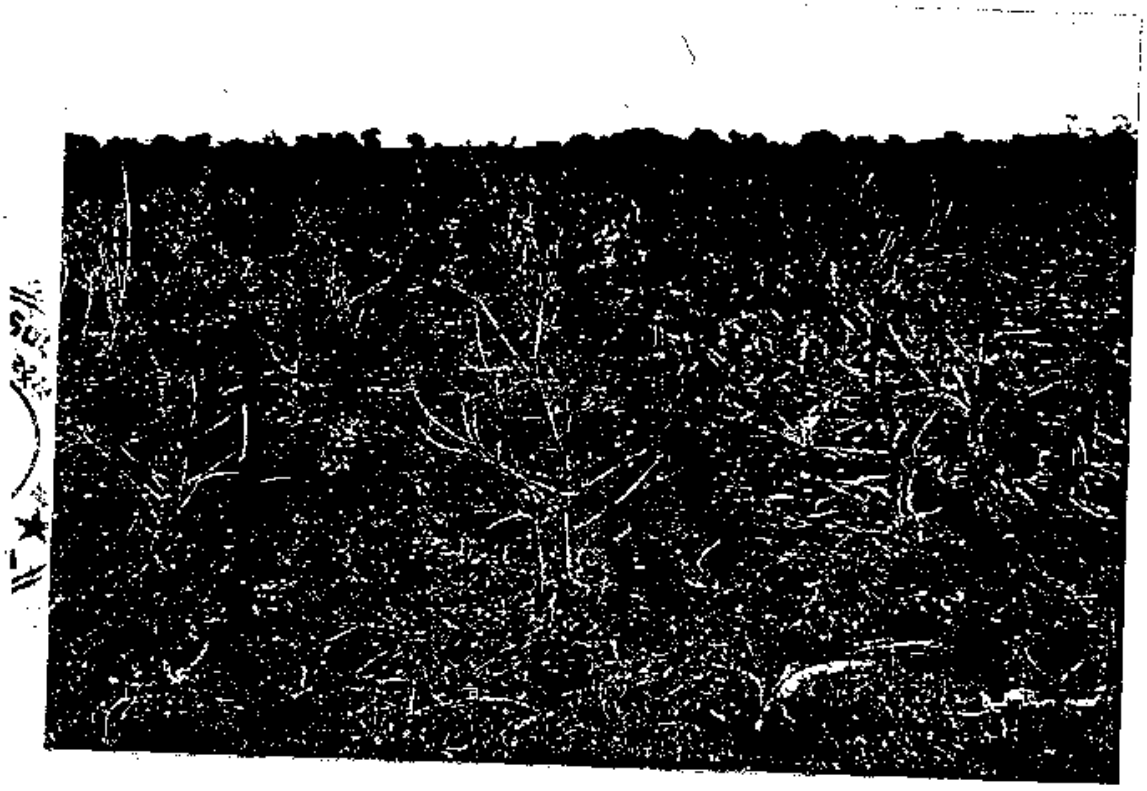
2011		

SCHEDULE OF THE PHOTOGRAPH OF LAND

Photograph of land bearing **Survey No. 148/1** in the Village **BAPODAR,** Taluka Ranavav, District Porbandar:



SELLER:

Shri BAPODARA BHANUBHAI AALABHAI _____

PURCHASER :

HIRACO RENEWABLE ENERGY PRIVATE LIMITED,
through its authorized signatory Mr. R. P. Tiwari _____

CONFIRMING PARTY:

Shri JAYESHBHAI VINODRAY JOSHI _____

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2011		

SCHEDULE AS PER SECTION 32(C) OF THE REGISTRATION ACT

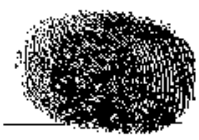
Name and Signature of the Seller **PHOTO** **Left hand thumb**

(Shri BAPODARA BHANUBHAI AALABHAI)

Name and Signature of the Purchaser **PHOTO** **Left hand thumb**

(HIRACO RENEWABLE ENERGY PRIVATE LIMITED,
through its authorized signatory Mr. R. P. Tiwari)

Name and Signature of the Confirming Party **PHOTO** **Left hand thumb**



(Shri JAYESHBHAI VINODRAY JOSHI)

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અનુક્રમ નંબર ૧૨૩૧ સને ૨૦૧૧

ના મે માસની ૧૨ મી તારીખે

૧૬ થી ૧૭ વાગ્યાની વચ્ચે રણાવાવ

સબ રજીસ્ટ્રારની કચેરીમાં રજુ કર્યા.

પહોંચ નંબર: ૨૦૧૧૨૨૪૦૦૧૨૩૪

ફીપહોંચી છે તે

	રૂ. પૈસા
રજીસ્ટ્રેશન ફી	૨૮૦૪૦
નકલ કરવા ની ફી સાઈડ / ફોલીયાં (16):	૧૬૦
અન્ય ફી	૦
કુલ એકંદરે રૂ.	૨૮૨૦૦

આર.પી.તીવારી તે હીરકો રીન્યુએબલ એનર્જી પ્રા.લી.ના અધિકૃત સીગ્નેટરી

(H.G.KUKADIYA)
સબ રજીસ્ટ્રાર
રણાવાવ

(H.G.KUKADIYA)
સબ રજીસ્ટ્રાર
રણાવાવ

ક્રમ નંબર	પક્ષકારનું નામ અને સરનામુ	ઉમર	ફોટોગ્રાફ	ડા.હા.અં.ની છાપ	સહી
આપનાર					
.000	બાપોદરા ભનુભાઈ આલાભાઈ રહે, બાપોદર	૩૯			
લેનાર					
.000	આર.પી.તીવારી તે હીરકો રીન્યુએબલ એનર્જી પ્રા.લી.ના અધિકૃત સીગ્નેટરી અમદાવાદ	૫૦			
Confirm					
.000	જયેશભાઈ વિનોદરાય જોષી રહે, જામનગર	૪૮			

દસ્તાવેજ લખી આપનાર આ દસ્તાવેજ લખી આપ્યાનું કબુલ કરે છે.

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2011		

૧ દેવા મુરુ બાપોદરા
રહે. બાપોદર

૨ બાપોદરા સામતભાઇ ભનુભાઇ
રહે. બાપોદર

તેઓ કહે છે કે સદરહું લખી આપનારને તેઓ જાતે ઓળખે છે, અને તેમની ઓળખાણ આપે છે.

૧. [illegible]

દેવાભાઇ

તારીખે ૧૨ માહે મે - ૨૦૧૧

H.G.KUKADIYA
સબ રજીસ્ટ્રાર
રાણાવાવ

બજાર કિંમત નક્કી કરવા અંગેનું
ફોર્મ નં. ૧ રજુ થયેલ છે.

તારીખ : ૧૨/૦૫/૨૦૧૧

H.G.KUKADIYA
સબ રજીસ્ટ્રાર
રાણાવાવ

RANAVAV
1231
2011

ઇકમટેક્ષ રૂલ્સ ૧૯૬૨ ની જોગવાઇ મુજબ (૧) પાન નં/ઇ.જ.ર. નંબર દર્શાવેલ છે. જેનં ખરાઇ કરવામાં આવેલ છે.

આપનાર નંબર
લેનાર નંબર
સંમતી આપનાર નંબર

તારીખ : ૧૨/૦૫/૨૦૧૧

(H.G.KUKADIYA)
સબ રજીસ્ટ્રાર
રાણાવાવ

ઇકમટેક્ષ રૂલ્સ ૧૯૬૨ ની જોગવાઇ મુજબ..... ફોર્મ નંબર ૬૦ ઠરાવેલ નમુનામાં રજુ કરવામાં આવેલ છે.

આપનાર નંબર
લેનાર નંબર
સંમતી આપનાર નંબર

તારીખ : ૧૨/૦૫/૨૦૧૧

(H.G.KUKADIYA)
સબ રજીસ્ટ્રાર
રાણાવાવ

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1231	15	15
2011		

૧ નંબરની બુકના 1231 નંબરે નોંધ્યા છે.

તારીખ : ૦૮/૦૮/૨૦૧૧

P J Vyas

સબ રજીસ્ટ્રાર
રાણાવાવ

એ.એસ.આર.-૨૦૧૧ ફાઇનલ
જંત્રી અન્વયે સદરહુ મિલ્કતમાં
આવેલા જંત્રી ભાવ અન્વયે
વાપરવા પાત્ર ડ્યુટી-રૂા. [illegible] /-
વાપરેલ ડ્યુટી રૂા. [illegible] /-જણાતા
ખુટતી ડ્યુટી રૂા. [illegible] /-આજરોજ
તા.-૮/૮/૧૧ થી વસુલાત લઇ
નોંધવા હુકમ કર્યો.
[illegible] ૨૦૧૧૨૪૦૦૩૩૮
તા-૮૮૧૧

સબ-રજીસ્ટ્રાર
રાણાવાવ

The Seal of the Sub-Registrar Ranavav
રાણાવાવના સબ-રજીસ્ટ્રારની મહોર

Annexure 12

Social Audit Report

Social Safeguards Audit Report

20 MWp Hiraco Solar Power Project

August 2012

Hiraco Renewable Energy Private Limited

The company hereby acknowledges that as per the mandate letter signed between company and Ernst & Young (E&Y) on 6th January 2012, E&Y has assisted the company in preparation of the Social Safeguard Audit Report based on data and information provided by the company to E&Y.

Contents

1. Introduction

1.1 Project Description

Hiraco Renewable Energy Private Limited (HREPL) was incorporated on 4 November 2010 to setup a solar PV power project with capacity of 20 MWp at villages Bapodar & Kerala, District Porbandar in the state of Gujarat (India). The project is implemented under the Solar Power Policy 2009 of Gujarat. Crystalline Silicon PV solar cells shall be used in the project to generate electricity. HREPL (the 'Company') has already signed a Power Purchase Agreement (PPA) for 25 years with Gujarat Urja Vikas Nigam Limited (GUVNL) with permission from Government of Gujarat, for sale of the power generated from the project.

Table 1: Project details

Sl. No	Particulars	Descriptions
1	Project site	Hiraco
2	Village Name (s)	Bapodar & Kerala
3	District Name	Porbandar
4	Name of the state	Gujarat
5	Latitude	21' 37' 39.4" (North)
6	Longitude	69' 49' 57.1" (East)
7	Road Accessibility	Road connectivity via Porbandar
8	Nearest Airport	Porbandar
9	Nearest City	Porbandar
10	Land available (Hectares)	62.6331
11	Water requirement (LPD)	10,500
12	Annual Global Irradiance (kWh/m^2)	2059
13	Type of PV Module	Cr-Si
14	Proposed Capacity (MW)	20 MWp
15	Capacity of each module proposed (Wp)	230 to 245
16	Total number of PV modules	85560
17	Inverter model	Sunny central 800KW 3 Phase PCU
18	Annual electricity supplied to grid (MWh)	35249
19	Annual Plant Load factor (%)	20.22
20	Project Cost (Million INR)	2365

A social safeguards review was conducted for the Project on 26 February 2012 to check the project's compliance to the ADB 2009 Safeguards Policy Statement (SPS) – Safeguards Requirements (SR) on 2 Involuntary Resettlement and (SR) 3 on Indigenous Peoples. The review comprised of site visit to the plant area, including the labour camps, canteen facility, the access road leading to the site; informal discussions with few of the landowners and local community members; meetings with the management at Corporate Office in Delhi; and review of available project documentation. The site photos are attached as Appendix 1.

1.2 Need for the Project

Fast economic growth of the state of Gujarat has resulted in increase in electricity consumption by the industrial and commercial sectors. With the current available capacity, Gujarat is not in a position to meet its requirement either in energy requirement terms or peak capacity requirement terms. Energy requirements of the Gujarat state has increased from 53693 MU in FY 2001-02 to 70412 MU in FY 2009-10 with an energy shortfall of 3149 MU in FY 2009-10.

The Electricity Act 2003 stipulates minimum percentage of energy to be derived out of renewable energy sources which shall be binding on all states. Also the Gujarat Electricity Regulatory Commission has made it mandatory for distribution licenses in the state to purchase a fixed percentage of their total power procurement through renewable energy sources, both solar and non solar.

1.3 Project Location

The project is located at Latitude 21' 37' 39.4" (North) and Longitude 69' 49' 57.1" (East). The site is located in villages Bapodar & Kerala, District Porbandar of the state of Gujarat, India. The location of the project is at an elevation of about 15-20 metres from the mean sea level. . The project location has well established connectivity and accessibility through road, rail, air and port. Overall the project area is flat with gentle slope. Figure 1 and 2 depicts the map of the region indicating the project location.

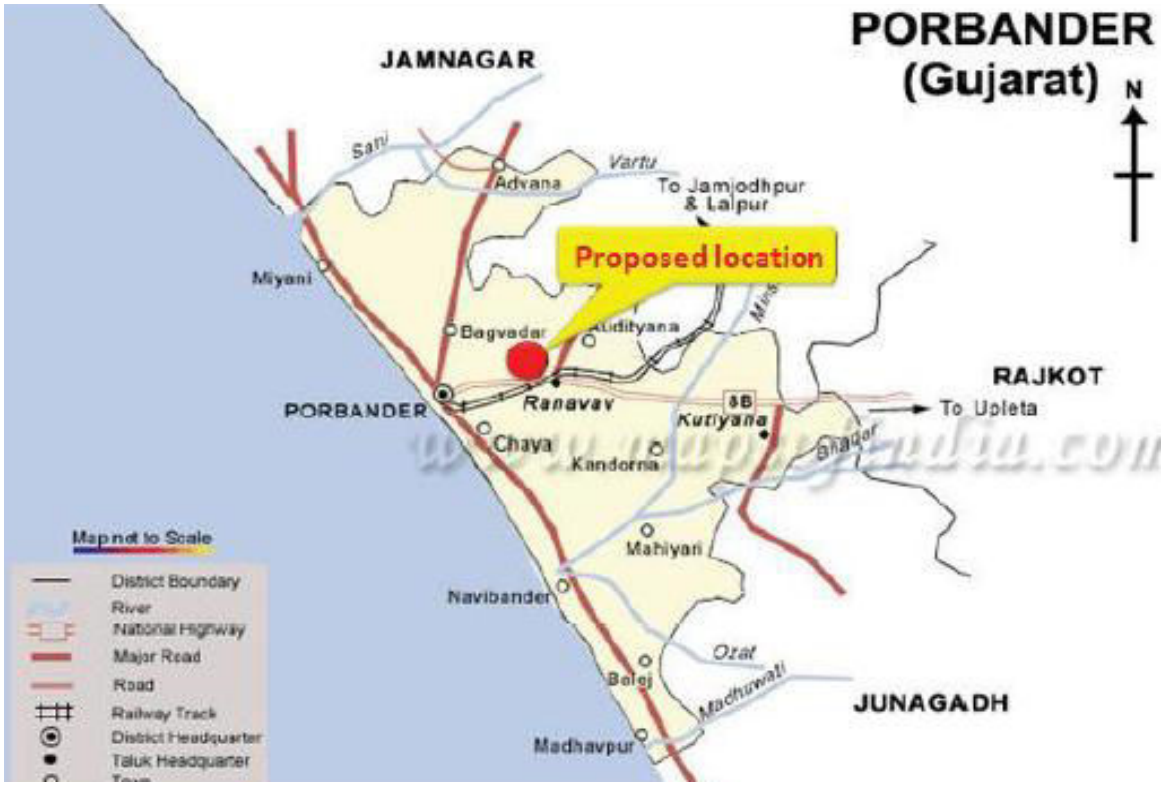

Figure 1: District map of Porbandar (Gujarat) marking the project location (Source: Detailed Project Report)

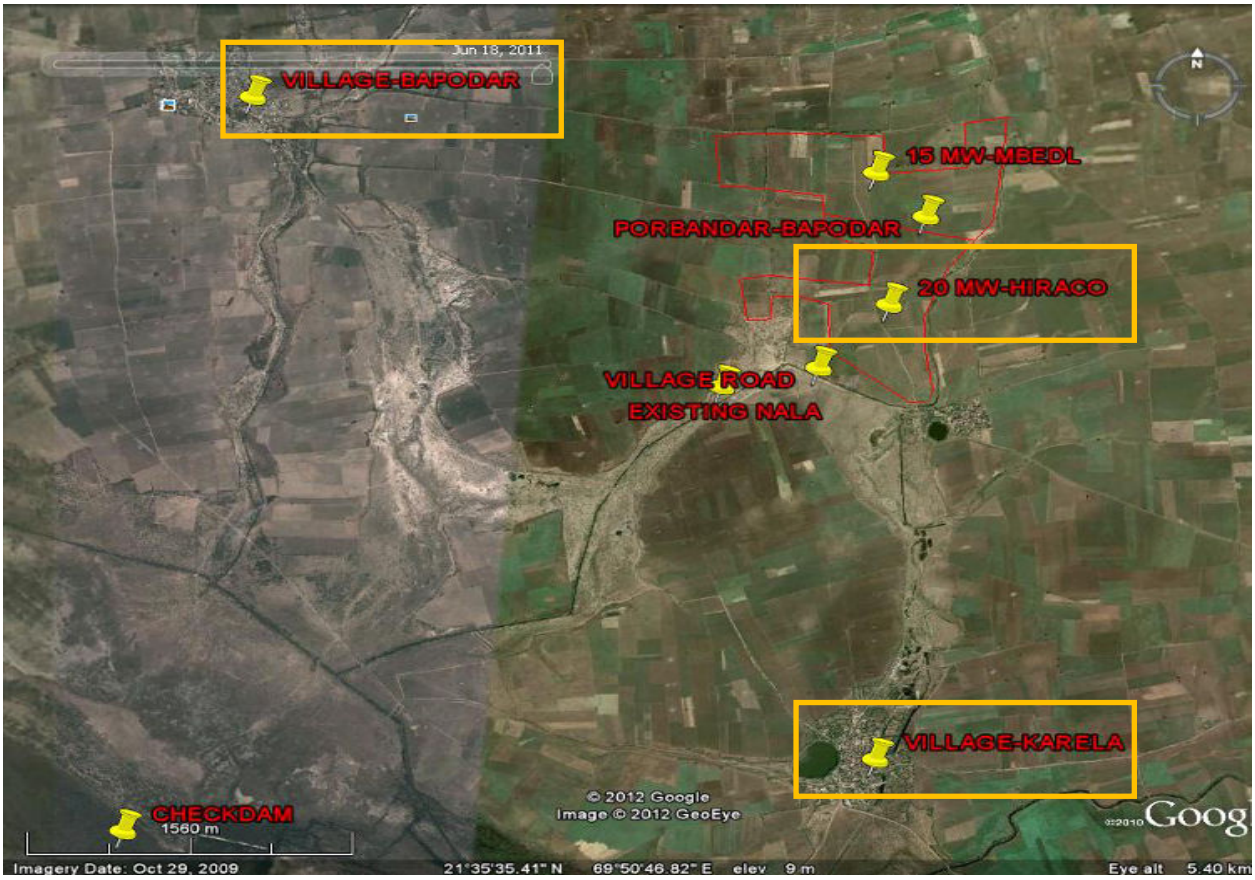

Figure 2: Satellite view of Village Bapodar & Kerala (Porbandar), Gujarat (Source: Detailed Project Report)

1.4 Project Status

The current project status, outlining the sequence of major activities and the time required for engineering, construction, installation and commissioning of the 20MWp solar PV power plant is provided below. The project commissioned on 18 April 2012.

Table 2: Implementation schedule of the project

Activity	Oct'11	Nov'11	Dec'11	Jan'12	Feb'12	Mar'12	Apr'12
Hiraco							
Foundations							
Modules Shipment at Indian Port- Hanwha							
Discharge and Custom Clearance							
Module Availability at site							
Structure Availability							
Structures Erection							
Module Erection							
Inverters Shipment							
Inverters at Site (SMA - 800 watt)							
Inverter Room / LT Room - Building ready							
Inverters Erection							
TL availability							
Testing and commissioning							
Erection by Areva							
Date of Commissioning							**18 April 2012**

1.5 Objectives and Scope of the Report

This report is prepared to assess the compliance of the 20 MWp Solar Power Project at Hiraco with the 2009 ADB Safeguards Policy Statement, Social Analysis in Private Sector Projects, 2009, ADB's Gender and Development Policy, 1998, Social Protection Requirements as per ADB's Social Protection Strategy 2001 and IFC Performance Standards.

The social compliance audit that was conducted on 26 February 2012 at the project site at Hiraco, District Porbander, Gujarat had the following objectives:

- Identify past or present concerns related to impacts on involuntary resettlement (physical or economic displacement) and ethnic minorities/Indigenous Peoples;

- Determine whether project actions were in accordance with ADB's SR2 and SR3 principles and requirements; and
- Prepare a corrective action plan (CAP) containing necessary remedial actions (if any)

This report provides the observations and recommendations on the above.

1.6 Methodology

The following activities were undertaken for the purpose of conducting this audit:

- Data collection from secondary sources such as Forest Atlas and published GOIs data from 2001 population census statistics data, as well as from authorities such as Gujarat Department of Social Justice and Empowerment, and other Departments.

- Preparation of checklist for collecting project related information against ADB guidelines

- Review of national and local laws / regulations and procedures relating to land acquisition, employment of labour etc.

- Review of land allocation documents, permits and other relevant available documents

- Site visit to the plant area, labour camps, canteen facility etc.

- Interviews on a sample basis with the following:
    - Employees at the site
    - Contract labour including their family members staying at the labour camps
    - Local community people around the site
    - Land owners

2. Audit Findings – Involuntary Resettlement

2.1 Land Requirements for the Project

The total land required for the Project's solar power generation facility is 62.63 Hectares (ha). The land has been acquired from two villages namely Bapodar and Kerala. Out of the total land area, the PV module array has been established on 41.28 ha, while 1.21 ha was required for the balance structures such as the control room building and switchyard. The remaining 20.142 ha is an open area.

Table 3: Land details

Village	Type of Landuse Prior acquisition	Area in (Hectares)
Bapodar	Agriculture	**31.07**
Kerala	Agriculture	**31.56**
Total		**62.63**

2.2 Land Acquisition Process & Compensation

The land acquired for the project site is totally private land and has been purchased on a voluntary basis (willing seller-willing buyer basis) from the land owners. A third party (land arranger) was appointed by the Company for helping in the purchase of land for the project. The land was purchased from twenty four (24) major land owners having their land in Bapodar and Kerala. The compensation rate offered and paid to the land owners on an average was INR 200 per square metre of land which was more than the existing Government circle rates of INR 69 to 80 per square metre of land depending upon the time of purchase. The payment of compensation and land registration process was completed during the period from May 2011- January 2012

Discussions with land owners on a sample basis during site visit indicated that the land sold for the project was not much productive for them because of the higher salt concentration in the ground water. As per the land owners, the sale of land came as an opportunity to earn income from an otherwise unproductive land. Also, as per the landowners, there were other productive plots that were available with them. Mostly cash crops such as cotton and groundnuts are cultivated in the region.

2.3 Land or Right of Way (ROW) Requirements for Associated Facilities

The solar power plant will be using the following associated facilities: access roads, transmission lines and sub-station. The project will utilize the existing public roads; no new roads will be built as part of this project. The power generated from the solar power plant is evacuated through a 66kV transmission line (approximately 13.5 km in length) to Rana Kandorna Sub-Station of GETCO. The Rana Kandorna substation is shared with Moser Baer Energy & Development Limited.

As the project is planned under the Solar Power Policy (2009) of the state of Gujarat, and as per the terms of Power Purchase Agreement, it is the responsibility of GETCO to arrange, provide and maintain the power transmission evacuation facilities upto the 66 kV switchyard of the project. However, in the interest of meeting the commissioning schedule for the project, It was agreed between GETCO and the Company that the Company would manage the construction of transmission lines under the overall supervision and approval of GETCO. GETCO will reimburse the transmission line expenses to SPVs on the basis of GETCO SOR (schedule of rates) while the supply of towers, overhead conductors and other items issued as free issue items for such works.

The Construction of the 66kV 13.5km Transmission Line from Hiraco to Substation of GETCO at Rana Kandorna to be reimbursed by GETCO required the setting up of 40 towers. Each tower footing required 75 sq.m. of land. For setting up of transmission line towers, approximately 50 landowners have been compensated. A total compensation of around INR 8million has been paid or approximately INR 0.15mn per tower footing. The period of payments to landowners and tower erection was in December 2011 to February-March 2012. No further land acquisition or involuntary resettlement issues are expected from the use of the substations which have been in existence for more than 10 years. The transmission line is shared with 15 MW Solar Power Project namely Moser Baer Energy and Development Limited.

The Company has awarded transmission line contract to contractors who are nominated and approved by GETCO. Under these contracts the works have been executed under the supervision of GETCO engineers and in line with GETCO existing policies and frameworks.

Table 4 Information on Associated Facilities

Associated Facilities	Responsible Agency	Existing or New	Type of Land
Access Road	Existing Village Road (State Govt.)	Existing	Existing Village Road (Kuttcha Type)
Transmission Line	Owner - GETCO	New till sub-station. Date of Completion : 15th April 2011	Private Agricultural and Govt. Land
Substation	Owner - GETCO	Existing	

2.4 Extent of Involuntary Resettlement Impacts

There were no permanent inhabitants dwelling on the site as confirmed by interviews with the local community during the site visit. As per the community members, there were only five temporary shelters/sheds at the project site which were used by the farmers/field workers for taking rest during work breaks. Two out of the five structures are retained for use in the project activities while others have been demolished. The compensation for the shelters was taken into consideration during the land purchase agreement with the land owner. The project site is located far from the coast line and no *banders* or fishing communities were affected. The project also does not require land acquisition of *gauchar* or grazing land or any state-owned wastelands. Given the characteristics of the site as

described above, the construction and operation of the power generation site is not expected to have involuntary resettlement impacts.

The project has complied with the national laws and regulations on land acquisition and has incorporated National Resettlement and Rehabilitation Policy (2007) and ADB's SPS (2009) as follows:

- Compensation for temporarily shelters has been considered during the land purchase agreement with the land owners
- Meaningful consultations with affected people in the issues of land acquisition, or loss of livelihood, if any, have been conducted

Figure: Stakeholder consultation held on Nov 10, 2011

- Employment opportunities have been provided to few of the project affected people and local villagers during project construction activities
- Established a grievance redressal mechanism to receive and facilitate resolution of the concerns of affected persons. Please refer section 5(i) for details on community grievance redressal mechanism

2.5 Applicable Regulations governing transfer of land to the Project

The land transfer to the project has been done as per section 55 of the Saurashtra Gharkhed Tenancy Settlement and Agriculture Land Ordinance 1949 (as amended in 1997[1]) applicable in Gujarat. Section 55 outlines the provisions for the Sale of land for bonafide industrial purpose. The following table shows how the acquisition has complied with the provisions of this ordinance:

[1] See amendment available from http://www.revenuedepartment.gujarat.gov.in/revenuefinal/gujarati/pdf/gr03_guj_act_no-06_1997.pdf

Provisions	Status of Compliance
(1) Nothing in section 54 shall prohibit the sale or the agreement for the sale of land for which no permission is required under sub-section (1) of section 65B of the Bombay Land Revenue Code, 1879 in favour of any person for use of such land by such person for a *bonafide* industrial purpose:	
Provided that – (a) The land is not situated within the urban agglomeration as defined in clause (n) of section 2 of the Urban Land (Ceiling and Regulation) Act, 1976.	Not Applicable (NA)
(b) Where the area of the land proposed to be sold exceeds ten hectares, the person to whom the land is proposed to be sold in pursuance of this sub-section shall obtain previous permission of the Industries Commissioner, Gujarat state or such other officer, as the State Government may, by an order in writing, authorize in this behalf,	Permission has been obtained from the Industries Commissioner for the project
(c) The area of the land proposed to be sold shall not exceed four times the area on which construction for a *bonafide* industrial purpose is proposed to be made by the purchaser: Provide that any additional land which may be required for pollution control measures or required under any relevant law for the time being in force and certified as such by the relevant authority under that law shall not be taken into account for the purpose of computing four times the area,	
(d) Where the land proposed to be sold is owned by a person belonging to the Scheduled Tribe, the sale shall be subject to the provisions of section 73AA of the Bombay Land Revenue Code, 1879.	No land has been purchased from person belonging to the Scheduled Tribe. . All the landowners from whom land was purchased were from the Hindu community other than SC or ST.
(2) (a) Where the land is sold to a person in pursuance of sub section (1) (here in after referred to as "the purchaser"), he shall within thirty days from the date of the purchase of the land for a *bonafide* industrial purpose, send a notice of such purchase in such form along with such other particulars as may be prescribed, to the Collector and endorse a copy there of to the Mamlatdar.	The Notice of Collector and endorsement of registered sale deeds are being complied with the completion of land acquisition for the [project.
(b) Where the purchaser fails to send the notice and other particulars to the Collector under clause (a) within the period specified therein, he shall be liable to pay, in addition to the non-agricultural assessment leviable under this Ordinance, such fine not exceeding two thousand rupees as the collector may, subject to rules made under this Ordinance, direct.	
(c) Where, on receipt of the notice of the date of purchase for the use of land for a *bonafide* industrial purpose and other particulars sent by the purchaser under clause (a), the Collector, after making such inquiry as he deems fit –	
(i) is satisfied that the purchaser of such land has validity purchased the land for a *bonafide* industrial purpose in conformity with the provisions of sub-section (1), he shall issue a certificate to that effect to the purchaser in such form and within such time as may be prescribed,	Certificate will be issued once the process under Section 2A is complete
(ii) is not so satisfied, he shall, after giving the purchaser an opportunity of being heard, refuse to issue such certificate and on such refusal, the sale of the land to the purchaser shall be deemed to be in contravention of Section 54.	

3. Audit Findings: Indigenous Peoples

3.1 Project Context

The total land acquired by HREPL falls within the villages of Bapodar and Kerala situated in Ranavav Taluk, Porbandar District, Gujarat State.

a) Village Bapodar

Bapodar is a mid-sized village located in the district of Porbandar, Gujarat (India). Bapodar is at a distance of around 14 km from its Taluka - Ranavav and around 22 km from district Porbandar. As per the records of Census 2001, the village has a population of about 1729 persons living in around 367 households. Population wise Bapodar village has around equal male -female ratio. Around 70% of the village population consists of the Hindu community. The Hindu castes in the village include Nagar Brahman, Maidh or Mer-Kshatriya and Krushaks etc. All the landowners from whom land was purchased were from the Hindu community not belonging to Scheduled Tribes. Majority of the households rely on agriculture as their main source of income in the village.

Based on our discussions with the local community members on a sample basis, it was observed that no person belonging to scheduled tribe was currently residing in the village.

Population Details

Total Population	1729
• Male Population	848
• Female Population	881

b) Village Kerala

Kerala is a small village located in the district of Porbandar, Gujarat (India) and is located adjacent to village Bapodar. It is at a distance of around 12 km from district Porbandar and 346 km distance from the main city Gandhinagar (Gujarat). As per the records of Census 2001, the village has a population of about 368 persons living in around 78 households. Around 70% of the village population consists of the Hindu community. The Hindu castes include Nagar Brahman, Maidh or Mer-Kshatriya and Krushaks etc. All the landowners from whom land was purchased were from the Hindu community not belonging to Schedule tribes. Population wise Kerala village has around equal male - female ratio. Majority of the households rely on agriculture as their main source of income in the village.

Based on our discussions with the local community members on a sample basis, it was observed that no person belonging to scheduled tribe was currently residing in the village.

Population Details

Total Population	368
• Male Population	195
• Female Population	173

Demographic details of the Porbandar District as per Census 2001:

Total Population	**536835**
• Male Population	275821
• Female Population	261014
Total Workers	**215,134**
• Main Workers	173594
• Marginal Workers	41,540
• Non-Workers	321,701
Literate Population	**316172**
• Literate (Male)	184717
• Literate (Female)	131455

The project construction and operation will not in any way affect the dignity, human rights, livelihood systems and culture of the residents of the village. Moreover, the lands where the project's solar power generation facility are being constructed are not owned, used, occupied, or claimed as ancestral domain or asset of any tribal groups. The project is therefore expected to be classified as category C for both involuntary resettlement and IPs.

4. Consultation and Participation

During project construction, the Company held meetings and public consultations with the residents of Bapodar and Kerala villages. The Company made a presentation on the proposed project, development prospects, project impacts and measures to mitigate possible negative impacts. The prospects of improving social and economic status of the region as a result of a successful project implementation as well as corporate social responsibility (CSR) activities of the Company were also discussed. The CSR activities proposed by the Company and to be taken up during the operational phase of the project include:

- Community development programmes
- Education programme for children
- Women Empowerment programmes

During the site visit, discussions were undertaken on an informal basis with a group of 7-8 community members from Kerala and Bapodar villages who confirmed that they were made aware of the project by the Company. Some persons in the village had already been contracted as security guards for the project. They indicated their satisfaction with the project which will bring more jobs to the village and opportunities to set up small businesses for construction and operational workers.

5. Audit Findings: Other Social Considerations

Other social considerations addressed in this review are related to employee engagement, gender relations, provision of facilities for labour force and safety.

a) Employee Engagement

HREPL has an existing human resource policy and manual covering employee benefits, equal opportunity, non discrimination, grievance mechanism and others that needs to be followed by all employees including contract workers at the site location. These include procedures for hiring and recruiting, probation, training, performance review, promotion, insurance, salary and compensation, resignation, lay-off and retrenchment, leave and vacation, and superannuation, which follow Indian labour laws. The policies have been displayed at the HREPL site in local language for the awareness of the workers. Most of the construction labours at site are employed on contractual basis. Worker committees have also been formed at the site location on health and safety, harassment and abuse and grievance handling for consultation with the workers.

The preference of the company is to hire local labour during project construction provided they meet the required selection criteria. It also has a standard clause in the contractor's agreements, binding the contractor to comply with the local labour laws and covers ILO standard.

b) Labour Influence

Construction phase

During construction phase, there has been an influx of working labour population and a labour colony is being constructed with basic amenities for the labour working on the project. The peak labour population is approximately 650-700 laborers for three months and may have an impact on the social fabric of the area surrounding the project. However, this impact is envisaged to be insignificant due to the following reasons:

- Temporary labour colonies, equipped with basic amenities, have been situated in the areas already acquired for the project.
- The impact is temporary in nature as it is restricted to the construction phase of the project. After construction phase, the areas acquired by labour colonies shall be reverted to the status at the preconstruction phase.

Therefore, conflict of the migrating labour with locals will not take place during the construction phase.

Operation Phase

No impact on the local life pattern is envisaged due to operational phase of the project.

c) Gender and Development

- Women were also involved during the community consultation process held during the construction phase of the project. However, no issues or concerns were raised by the women participants during the consultation process.
- No adverse impact could be envisaged on women in the nearby villages due to the solar power project. The Company has a standard clause in the contractor's agreements, binding the contractor to comply with the local labour laws. The clause includes the following:
  - Local labour to be hired as much as possible;
  - Ensure labour related regulations are met;
  - In case of outside labour, ensure that their working conditions as well as camps meet local regulations and best practice;
  - Health and safety training of the labour, raising awareness about STDs, HIV and maintaining behavior standards while moving in the community should be a priority
  - Community should be consulted at regular intervals. Any complaints or concerns with respect to labour should be addressed without delay

The project manager ensured compliance jointly with team and contractors duing the construction phase of the project.

- The Company has proposed to initiate women empowerment programmes in the nearby villages during the operational phase of the project. However no such initiative has been under taken till now.
- On an average, 5 % of female workers were employed during the construction phase of the project.
- Seven contractual workers are currently employed during the operation phase. Female workers are not employed during the operational phase of the project, as the activity of cleaning the solar panels is carried out during night time only and for security reasons, male workers are employed. Further, as the project site is located at remote location, female workers are not employed for safety reasons. However, during day time, few female workers are employed for house-keeping in the project office and cutting grass in the fields. Currently, two female workers are employed for such activities.
- The maximum number of female workers employed during the construction phase of the project was around 40. All the female workers were hired on contract basis.
- Separate accommodation facility has been provided to female workers staying with their families at the labour camp.
- Migrant workers who brought their families during the construction phase of the project were provided separate accommodation facility in the labour camp. In order to ensure health and safety of such workers and their families, the company has a standard clause in the contractor's agreements, binding the contractor to comply with the local labour laws.

d) Working Conditions

- Adequate steps have been taken to prevent accidents and injury to health arising out of, associated with, or occurring in the course of work, by minimizing, so far as is reasonably practicable, the causes of hazards inherent in the working environment
- Regular health and safety trainings are provided to workers at site
- Fire mock drills are being conducted to ensure that all workers in the unit are familiar with the site's overall evacuation procedures
- Separate mobile toilet facilities for men and women, and drinking water facility have been provided to workers at site locations

e) Prohibition of child labour

- No instance of child labour or young worker was observed at the time of the site visit
- The company has strict policy in place not to employ anyone below the age of 18 years. These policies and procedures conform to the provisions of the relevant ILO standards. The HR policy for contract workers also restricts the employment of child labour by contractors.

f) Payment of wages

- Minimum wages are paid to the workers at site as per the applicable minimum wages in Porbandar, Gujarat
- All eligible workers have been covered under ESI (Employees State Insurance) & EPF (Employees Provident Fund) schemes
- The workers are paid equal wages for similar kind of work regardless of gender. Equal pay for equal work for workers regardless of gender

g) Freedom of association

- Workers in the Company are free to join or form trade unions of their own choice and bargain collectively as per the Trade Unions Act, 1926. However, the workers were not associated with any trade union during the construction phase of the project. In the current operational phase of the project, the number of workers is presently limited to seven and they are also not associated with any trade union. The Company has developed a parallel means for independent and free association and bargaining for the workers by the formation of worker committees including adequate representation from management and workers. Worker committees have been formed to help workers raise concerns they may have with regard to plant working conditions and also increase their involvement in improving the work environment of the plant.
- The committees comprising representation from management and workers include:
  1) Health & Safety
  2) Anti -Sexual Harassment
  3) Grievance Handling

h) Working Hours

- Workers are not required to work in excess of 48 hours per week at the site location and are provided with at least one day off for every 7 days period on average. This is in compliance with the national laws on working hours. The laws include:
- Contract Labour (Regulation and Abolition) Act, 1970
- The Building & Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996

i) Grievance Management System

Environmental and social grievances were handled in accordance with the project grievance redressal mechanism defined under the HR policy for contractors. The Grievance Redressal Mechanism (GRM) for the project provides an effective approach for complaints and resolution of issues made by the affected community in a reliable way. This mechanism was established prior to construction and will remain active

throughout the life cycle of the project. Open and transparent dialogue will be maintained with project affected persons as and when needed, in compliance with ADB safeguard policy requirements.

The major objectives of the Grievance Redressal Mechanism System are to:

- create a platform / process for prevailing proactive Industrial Relations;
- make people accountable for timely redressal of grievances;
- establish a robust process for addressing contract worker grievances;
- create a healthy working atmosphere and drive active engagement at contract worker level;
- have a strategy, supporting long-term business requirements at site;
- prevent minor disagreements developing into more serious disputes later on;
- defend against legal intervention

A Grievance Redressal Committee (GRC) was formed at the project site to ensure affected people's grievances on both environmental and social concerns are adequately addressed and facilitate timely project implementation. The GRC included have the following members:

- Project head;
- Liasoning officer – Site In charge/Admin;
- Land seller

Grievance Redressal Mechanism for workers

The Company has a robust grievance management system that drives proactive industrial relation (IR) environment, enabling fair opportunity to contract workers to appeal against a grievance through a systematic process.

The process includes the following:

Step 1: Maintenance of Grievance Registers:

Grievance Redressal registers were kept at following locations:

- Register No. 1: Kept in Time Office.
- Register No. 2 onwards: Kept at various locations of the Plant as decided by the local HR Head.

Step 2: Communication of Grievance Redressal Mechanism

- All contract workers informed / communicated to register their Grievances in Grievance Redressal Registers, at the convenient locations.

- These Grievances registered / recorded in the registers are studied, analyzed and appropriate solution to query / grievances shall be responded to concerned contract workers by Time Office In-Charge, at least twice a week. The company will endeavor to resolve the aggrieved contract worker within 3 days of the grievance registered.

- Grievance Redressal Mechanism for Local Community

    - The Project Head is responsible for capturing, identifying, maintaining enquiries associated with community grievance in a register, and communicating progress to the concerned community member.

    - A Register shall contain information such as date, time, location and names of villager and grievance; if any. The record will summarize what information was provided to or discussed with the individual land seller.

At the site, there were 4 recorded grievances from the community. The grievances recorded were mainly requests for the Company to undertake activities like lighting facility to local temple, repair of roads, etc. There were no grievances related to land acquisition.

j) Labour Camps

The labour working on site is provided with temporary labour camps, which are close to the site. The labour camp facility is availed by the migrant workers and workers not residing in the nearby villages. Few of the workers are also staying with their family members including children at the camp. Separate shelters have been provided to such families. The labour camps have been provided with basic amenities like drinking water and electricity facility for the workers.

6. Conclusions and Recommendations

6.2 Conclusions

Based on the review of available documentation and information gathered during the site visit, there are no outstanding compensation issues with respect to the acquisition of land for the Project's solar power generation facility . The Project construction and operation will not in any way affect the dignity, human rights, livelihood systems and culture of the residents of the village. Moreover, the land where the Project's solar power generation facility has been constructed is not owned, used, occupied, or claimed as ancestral domain or asset of any tribal groups.

The information gathered from the available documents and discussions with relevant HREPL staff and affirmation from the HREPL management regarding their continued harmonious relationship with the communities in the Project area are considered sufficient to support the social compliance audit findings relevant to social safeguards. With respect to ADB's SPS, the Project's categorization on involuntary resettlement and indigenous peoples should be categorized as 'C' respectively, and no corrective action plan will be required.

Other social dimensions, such as recruitment of HREPL employees, local labour engagement through contracts and need based CSR initiatives based on community consultation by HREPL, are found to be satisfactory. The company has existing policies and procedures (e.g., human resource policy, contractual arrangements with contractors) to address potential concerns and issues. During implementation of the Project, the

Company is expected to apply the same policies and procedures as those the company maintains, and it will be required to monitor and report to ADB on contractor's engagement of local employees and labours following the relevant clauses on contractor's agreement and the Company's human resources policy.

6.2 Recommendations

The need based CSR initiatives based on community consultations may be initiated during the operation phase.

Appendix 1. Photos of the Hiraco site

Photograph showing consultation with the community members to address their project related concerns and need of the community

Photograph showing washing facility provided to workers during the construction phase

Photograph showing the drinking water storage tank at the project site during construction phase

Photographs showing the existing access roads leading to the site

	
Photograph showing the safety office at the project site	Photograph showing use of PPEs by the workers during the concrete mixing work