

Second Annual Monitoring Report to the Board of Directors
on the
Implementation of Remedial Actions
for the
Mundra Ultra Mega Power Project
in India
(Asian Development Bank Loan 2419)

15 August 2017

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The Compliance Review Panel thanks all those who contributed to this second monitoring report of the Mundra Ultra Mega Power Project in India; the Coastal Gujarat Power Limited, an ADB private sector client, the complainants, and government agencies for their cooperation during our site visit, the Asian Development Bank (ADB) Board of Directors, in particular, the members of the Board Compliance Review Committee; and ADB Management and staff.

ABBREVIATIONS

ADB	– Asian Development Bank
CGPL	– Coastal Gujarat Power Limited
GPCB	– Gujarat Pollution Control Board
MoEF	– Ministry of Environment and Forests
NIO	– National Institute of Oceanography
PSOD	– Private Sector Operations Department (ADB)
PM _{2.5}	– (respirable) particulate matter less than or equal to 2.5 microns
PM ₁₀	– (respirable) particulate matter less than or equal to 10 microns
RAP	– remedial action plan
VDAC	– village development advisory committee

WEIGHTS AND MEASURES

°C	– degree Celsius
km	– kilometer
MW	– megawatt

NOTE

In this report, “\$” refers to US dollars.

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I. INTRODUCTION

1. A request for compliance review of Loan 2419-IND: Mundra Ultra Mega Power Project in India (Project) was filed by three individuals, one of whom was representing a group of fisherfolk affected by the Project on 17 October 2013. The ADB Board of Directors (Board) authorized on 17 January 2014 a compliance review of the complaint. The CRP submitted its Final Report on the compliance review to the Board in March 2015.¹ The Board considered the CRP report on 30 March 2015. The compliance review was conducted in accordance with the 2012 Accountability Mechanism Policy (AMP).²

2. In response to the findings of noncompliance with the environment and public communications policies, the Private Sector Operations Department (PSOD), the operations department responsible for the Project, prepared a set of remedial actions that was sent to the CRP on 27 May 2015. This Remedial Action Plan (RAP) provides for measures to bring the Project into compliance with ADB's operational policies and procedures. The RAP was approved by the Board on 24 June 2015.³

3. This is the second annual monitoring report of the CRP on the implementation of remedial actions for this Project. According to para. 192 of the AMP, the CRP will monitor the implementation by ADB Management and staff of any Board-approved remedial actions relating to a complaint, to ensure that a project is brought into compliance with ADB's operational policies and procedures. Unless otherwise specified by the Board, the CRP will monitor the implementation of the remedial actions annually for up to 3 years from the Board decision on the RAP. The CRP does not monitor the actions of the borrower, the government or other agencies involved in the implementation of the project.

II. DESCRIPTION OF THE PROJECT

4. The Project is a coal-fired power plant which uses supercritical technology and has a total production capacity of 4,000 megawatts (MW). It was constructed on a build–own–operate basis near Tunda and Vandh villages in Mundra Taluka, Kutch district, Gujarat, India. The power plant has five 800 MW units. The total project cost amounts to about \$4.14 billion of which \$450 million was a loan by Coastal Gujarat Power Limited (CGPL) from ADB's ordinary capital resources without government guarantee.⁴ Of that amount, \$200 million is a syndicated loan provided together with the Export–Import Bank of Korea (Korea Eximbank) under a risk participation agreement. The private sector loan was approved by the ADB Board on 17 April 2008. A total of \$351.18 million had been disbursed to CGPL under the amount committed for ADB Loan 2419. Additional financing for the Project has come from the International Finance Corporation (IFC), Korea Eximbank, and local banks.

¹ ADB. 2015. Final Report on Compliance Review Panel Request No. 2013/1 on the Mundra Ultra Mega Power Project in India (Asian Development Bank Loan 2419), 9 March 2015.

² ADB. 2012 *Accountability Mechanism Policy*. Manila

³ ADB. Proposed Remedial Action Plan: India: Mundra Ultra Mega Power Project, also available at [https://lnadbg4.adb.org/dir0035p.nsf/attachments/R44-15%20\(as%20posted%203%20July%202015\).pdf/\\$FILE/R44-15%20\(as%20posted%203%20July%202015\).pdf](https://lnadbg4.adb.org/dir0035p.nsf/attachments/R44-15%20(as%20posted%203%20July%202015).pdf/$FILE/R44-15%20(as%20posted%203%20July%202015).pdf)

⁴ ADB Private Sector (Nonsovereign) Loan No. 2419: Mundra Ultra Mega Power Project with approval number 7276. Details of this project are at http://adb.org/projects/details?proj_id=41946-014&page=overview.

5. The Project is 1.5 kilometers (km) away from the coast of the Gulf of Kutch, which has often been described as an “ecological miracle” because of its shallow waters, intertidal zones, stretch of mangrove forests, and corals.⁵ More recently, the coastal zone along the Gulf has developed into an area of rapid industrialization. Between 2007 and 2012, the Ministry of Environment and Forests (MoEF) issued environmental clearances for 19,181 MW power plant capacity.⁶ In addition, numerous clearances have been provided for the expansion of ports in Gujarat. It has been argued that these developments, taken together, could have “huge adverse impacts on the environment and also on the livelihood of fishing communities.”⁷ The industrialization has received widespread international attention because of its perceived detrimental impact on the environment in the Gulf of Kutch.⁸

Figure 1: Tragadi *bander* with the CGPL plant at the background (left photo) and the Gulf of Kutch fronting it (right photo)



Source: Compliance Review Panel

6. The CGPL plant was constructed near Tunda and Vandh villages, on land used for pasture of the villagers’ livestock and about 2 km away from the Adani coal power plant. Commencing operation from 2009 to 2012, the Adani plant has a full operational capacity of 4,620 MW and does not use supercritical technology. With the proximity of the CGPL plant to the Adani plant, attribution of environmental impacts to one of the two plants is sometimes difficult. The CGPL plant uses the West port of the Adani port to unload its coal and also uses the intake channel, which is owned and operated by the Adani plant, for the intake of cooling water.

III. COMPLIANCE REVIEW AND REMEDIAL ACTION PLAN

7. The request for compliance review was sent to the CRP by (i) Bharat Patel, representing at least 12 project affected persons;⁹ (ii) Gajendrasinh Bhimaji Jadeja, a farmer; and (iii) Harun

⁵ Asher, Manshi. 2008. *How Mundra Became India’s Rotterdam*. InfoChange, December; and Fishmarc and Kutch Nav Nirman Abhiyan (with support from the Foundation for Ecological Security); 2010. *Kutch Coast: People, Environment & Livelihoods*. Draft report for discussion at a workshop in Kutch on 7–8 January 2010. India.

⁶ Ministry of Environment and Forests (MoEF). 2013. *Report of the Committee for Inspection of M/s Adani Port & SEZ Ltd. Mundra, Gujarat, April*. Kutch Coast: People, Environment & Livelihoods. pp. 73–74. New Delhi.

⁷ Footnote 6, p. 74.

⁸ Footnote 6.

⁹ B. Patel submitted to the CRP on 20 January 2014 a list of affected persons whom he said he was representing. The letter contained references to MASS and B. Patel’s position as general secretary. The president and the vice-president of MASS subsequently informed the CRP that MASS did not wish B. Patel to represent the association in this complaint. Accordingly, on 23 June 2014, the CRP accepted B. Patel as personal representative for the project-affected people for whom he presented authorization on 20 January 2014.

Salemamad Kara, a fish trader. The complaint listed the harm allegedly done by the Project to the affected persons' livelihood, health, and environment, and attributed it to ADB's failure to adhere to its environmental and social policies and procedures.

8. In its report on the compliance review,¹⁰ the CRP detailed its findings on inadequate consultation; inadequate identification of project affected persons; negative impacts on the livelihood of foot fishers as a result of discharging water with elevated temperature through the outflow channel and due to alterations made to the Modhva creek where the outflow channel was constructed; restriction of access to fishing grounds; coal dust and fly ash pollution; and health impacts due to degradation of ambient air quality. Also, the CRP report noted that there was dilution taking place in order to meet the required water quality levels in the outflow channel. The CRP noted the absence of adequate baseline data which made it difficult to establish the extent of harm resulting from the Project. The CRP found noncompliance with the following ADB operational policies and procedures:

- (i) OM Section F1: Environmental Considerations in ADB Operations (issued on 25 September 2006);
- (ii) OM Section F2: Involuntary Resettlement (issued on 25 September 2006);
- (iii) OM Section L3: Public Communications Policy (issued on 1 September 2005); and
- (iv) OM Section C3: Incorporation of Social Dimensions into ADB Operations (25 April 2007)

9. Following the CRP's findings, ADB Management presented a RAP which listed measures which would bring the Project into compliance with ADB's operational policies and procedures. (See Appendix 1.)

10. In its compliance review report, the CRP found harm resulting from fly ash and coal dust pollution in Vandh village, a community located immediately adjacent to the CGPL plant and also located near the Adani plant. But the CRP also found that ADB staff had paid careful attention to the implementation of mitigation measures to reduce coal dust and fly ash pollution in Vandh village. The CRP was thus of the view that ADB had exercised due diligence and acted in accordance with para. 67 of the ADB Environment Policy, which calls for the implementation of mitigation measures if unanticipated environmental impacts become apparent during project implementation.¹¹ As these mitigation measures were already underway and continue to be implemented, these measures are not part of the RAP. They are thus not monitored by the CRP but supervised by ADB staff under its regular supervision procedures.

11. As inadequate baseline data was collected during project preparation, the RAP provides for numerous studies to establish the impacts of the Project. The RAP provides that the CRP review these studies and provide comments. Based on the findings of the studies, agreements are then reached on what measures are to be taken to address the impacts. The very heavy emphasis on studies in the RAP was necessary as the absence of adequate baseline data made it impossible to specify the actions to address the impacts without further studies.

¹⁰ Final Report on Compliance Review Panel Request No. 2013/1 on the Mundra Ultra Mega Power Project in India (Asian Development Bank Loan 2419), 9 March 2015.

¹¹ See para.103 of Final Report on Compliance Review of Panel Request 2013/1 on the Mundra Ultra Mega Power Project in India (Asian Development Bank Loan 2419), 9 March 2015.

IV. RESULTS OF THE FIRST MONITORING OF THE REMEDIAL ACTION PLAN

12. In its first monitoring report to the Board of 13 September 2016, the CRP noted that during the first year of implementation of the RAP, significant progress has been made in the implementation of Board-approved RAP.¹² The CRP noted that ADB was actively engaged in supporting CGPL in the implementation of these actions. The CRP was particularly pleased about the progress made in the preparation of the Livelihood Improvement Plan for the 24 identified *Pagadiyas* (foot fishers) and noted the thorough efforts made by ADB staff concerned in conducting the access survey. The first CRP annual monitoring report found RAP actions no. 1, 2, and 5 in partial compliance; RAP action no. 3 was in noncompliance; and noted full compliance with RAP action no. 4.

V. RESULTS OF THE SECOND MONITORING OF THE REMEDIAL ACTION PLAN

13. For this second monitoring report, the CRP conducted a mission from 21 to 27 April 2017 to India. It met with the complainants, CGPL management and staff, conducted site visits at the plant, the nearby *bander*,¹³ where fisher families live during the fishing season, to nearby villages, and to the Modvha shoreline. The CRP met with various stakeholders, such as the NGO charged with the implementation of the social service programs for the *bander*. The CRP also met with the group of *pagadiyas* which had been identified to receive compensation, with representatives of the Village Development Advisory Committees (VDAC) of Modvha and Tragadi villages, which are charged with the implementation of the Livelihood Improvement Plan for *pagadiyas*. A representative of the NGO, which provides support for the implementation of the Livelihood Improvement Plan also attended the meeting with the *pagadiyas*. In preparation for the monitoring mission, the CRP reviewed quarterly progress reports submitted by ADB Management on the implementation of the RAP, supervision documents and all technical studies prepared under the RAP. The monitoring mission was led by Arntraud Hartmann, CRP member, and Dingding Tang, Chair of the CRP. Josefina Miranda, Compliance Review Officer from the Office of the Compliance Review Panel (OCRP) provided logistical support. A list of persons met by the CRP during its mission is provided in Appendix 2.

Figure 2: CGPL power plant with its outfall channel at the foreground



Source: Compliance Review Panel

¹² [https://lnadbg4.adb.org/dir0035p.nsf/attachments/Mundra-1stMonitoring-IN356-16-ForWeb.pdf/\\$FILE/Mundra-1stMonitoring-IN356-16-ForWeb.pdf](https://lnadbg4.adb.org/dir0035p.nsf/attachments/Mundra-1stMonitoring-IN356-16-ForWeb.pdf/$FILE/Mundra-1stMonitoring-IN356-16-ForWeb.pdf)

¹³ The term *bander* is used locally to identify a port or haven along the seashore where fisherfolk establish temporary or permanent communities for the purpose of carrying on their occupation.

14. The following describes the CRP's findings in its second year of monitoring of the implementation of the action plan and presents the CRP's comments, observations, and suggestions to ADB Management to bring the Project into compliance.

A. Disclosure of Information and Conduct of Consultations

Status of Compliance: At the time of this report, ADB is in partial compliance with this action.

Management's Action Plan No. 1: Action to address ADB's noncompliance in relation to CRP's findings on disclosure of information and conduct of consultations¹

Inclusive and transparent stakeholder consultations will be carried out to establish and address the impacts of the Project in relation to (i) thermal discharge into the outfall channel; (ii) livelihood of foot fisherfolk; (iii) access restrictions; and (iv) ambient air quality, as detailed in this Action Plan. As part of this consultative process, the affected foot fisherfolk will be identified; information on their livelihoods will be collected and impacts will be assessed; and measures to address livelihood impacts will be established in a Livelihood Improvement Plan, as detailed in this Action Plan.

(See Appendix 1 for the full text of the Management's Remedial Action Plan.)

15. **CRP findings regarding compliance with Action No. 1.** The CRP finds that since the first monitoring report, limited progress has been made in disclosing information and conducting consultations. The CRP is of the view that adequate disclosure of information is an integral part of inclusive consultations, which are required under the RAP. Inclusive consultations can only be conducted if relevant information is adequately disclosed. In April 2015, CGPL conducted consultations on several of the completed studies. (See para. 15 of the first CRP monitoring report.) In its first monitoring report, the CRP noted that these were useful meetings but also stated that *"it is not sufficient that the materials to be disclosed are only made available one time during a meeting in an oral presentation. The CRP finds it essential that all materials presented at the meeting should also be uploaded on the CGPL and ADB websites so that people who were unable to participate at the meeting can have access to the summaries of the studies and other documents which were presented at the meeting."*¹⁴ Unfortunately, no follow-up action has been taken on this recommendation. The materials presented at the April 2015 meeting, which included summaries in local languages of the NIO study; the livelihood improvement plan; and the access restriction study have not been disclosed on the CGPL website. At the time of the monitoring mission, only the report of the National Institute of Oceanography (NIO) had been uploaded on the CGPL website. Subsequent to the monitoring mission, in May 2017, the English version of the revised Livelihood Improvement Plan has been uploaded. RAP action 1 (b) asks that a summary of the NIO report be translated into the local language and shared with interested stakeholders (including fisherfolk) to obtain and record their views. Since April 2015, further consultations have been conducted on the Livelihood Improvement Plan with *pagadiyas* and representatives of the Tragadi and Modvha villages. On other studies, no further consultations have been conducted.

¹⁴ See para. 15 of First CRP Annual Monitoring Report.

16. For transparency reasons, the CRP also finds it important that the list of identified *pagadiyas* who receive compensation for income losses under the Livelihood Improvement Plan is uploaded on the CGPL website. The CRP recommends that the methodology on how these *pagadiyas* have been selected should be explained together with the list or, alternatively, reference should be made to the relevant sections of the disclosed Livelihood Improvement Plan where the methodology is explained. The grievance process should also be stated so that people who disagree with the selection of *pagadiyas* can file a complaint under the established grievance mechanism. A recommendation to upload this information on the CGPL website had been expressed in the first CRP annual monitoring report. The CRP notes, that this has not been done. The CRP has been informed by a group of people that, supposedly, a number of the *pagadiyas* selected to receive compensation, are – in the view of the informers - not working full time as *pagadiyas* and thus should not be eligible to receive compensation, while other *pagadiyas*, which – in the view of the informers – should have been included are not in the group of *pagadiyas* selected to receive compensation. The CRP in no way intends to take a view on this matter. The CRP had reviewed the methodology according to which the *pagadiyas* were identified and was satisfied with the survey methodology applied. The CRP cannot verify whether people identified were properly selected according to the methodology outlined. The CRP is of the view, that adequate transparency measures, such as disclosure of the methodology and the names of *pagadiyas* selected, are important to establish credibility of the process. If the methodology is made transparent, if the people selected according to the methodology is disclosed, and a grievance mechanism is established, people who question the appropriateness of the process, can launch their complaints through the grievance mechanism.

17. The Action No. 5 (d) specifies that a summary of the technical study which assesses the contribution of the Project to ambient PM₁₀ levels within the project airshed will be translated into local language and shared with local communities and other stakeholders. The draft study was completed in February 2017. (See para. 36.) A summary in local language has not yet been completed and consultations have not been conducted. CGPL has also completed a Baseline Health Profile in the Airshed of the Tata Mundra Power Plant and submitted to ADB in July 2016. (See para. 42.) The CRP encourages ADB Management to support CGPL to prepare a summary in local language and to conduct consultations with stakeholders. The CRP is of the view that both studies should be posted on the CGPL website and ADB website.

18. In its first annual monitoring report, the CRP expressed that ADB Management should encourage CGPL to also include the complainants in the consultation process. The complainants informed the CRP that no such consultation took place. The complainants informed the CRP that they have not seen any of the studies completed and marked for consultation in the RAP, other than the NIO study which is listed on the CGPL website. The complainants informed the CRP that a meeting took place with ADB staff during one of the recent missions. ADB staff informed the CRP that in June 2016, copies of the (i) presentations (in Gujarati) on the livelihood improvement plan and access restrictions, and (ii) the full access restrictions report in Gujarati were shared with the complainants. The complainants also confirmed that they, themselves, have not sought a meeting with CGPL. The CRP is of the view that complainants under the compliance review process are relevant stakeholders which should be included in the consultations. The CRP also recognizes that this requires the active engagement of the complainants.

19. While the CRP is concerned about the limited progress made in disclosure of the completed studies, the CRP notes the active consultation process underway with the 24 *pagadiyas* identified for compensation under the Livelihood Improvement Plan. Based on records received, the NGO and VDAC have conducted active consultations with the 24 *pagadiyas* identified for compensation, on how the compensation payments should be made. (See para. 25.)

As already noted in the first CRP annual monitoring report, active consultations with representatives of Modhva and Tragadi villages have also been conducted prior to completion of the Livelihood Improvement Plan for the identification of the group of *pagadiyas* entitled for compensation.

20. **CRP conclusions regarding compliance with Action No. 1.** The CRP notes that limited progress has been made in implementing disclosure and consultation measures, apart from the consultations conducted with the 24 *pagadiyas* who are entitled to receive compensation. Action No. 1 thus remains in partial compliance. In order to achieve full compliance, the following measures should be taken:

- (i) post access study on ADB and CGPL websites;
- (ii) translate into local language the summary of the technical study on air quality; disclose this summary; and consult with relevant stakeholders. Disclose the summary on ADB and CGPL websites;
- (iii) while not specifically mentioned in the RAP, the CRP is of the view, that a summary of the Health Baseline Survey should also be provided in local language and posted on ADB and CGPL websites; and
- (iv) The CRP strongly suggests that ADB Management encourage CGPL to post the names of the 24 *pagadiyas* selected for livelihood support on the ADB and CGPL websites together with an explanation on how *pagadiyas* were selected and where grievances can be filed.

B. Thermal Discharge from the Outflow Channel and Loss of Livelihood of Fisherfolk

Status of Compliance: At the time of this report, ADB is in partial compliance with this action.

Management's Action Plan No. 2: Action to address ADB's noncompliance in relation to CRP's findings on thermal discharge from the outflow channel and loss of livelihood of fisherfolk.

- (a) The National Institute of Oceanography ("NIO") has been engaged by CGPL and is carrying out field observations on the actual impacts of thermal discharge from the Project in Modhva Creek and adjoining coastal areas; this will involve validating the thermal modelling previously carried out by HR Wallingford during the environmental due diligence (prior to Project approval). NIO will complete this model conformity study.

Findings of the draft NIO report to be reviewed by ADB Management (engaging external specialist marine consultant). ADB Management will submit to the CRP, as soon as available, for review and comment the draft study prepared by NIO.

- (b) Summary of the NIO report to be translated into the local language and shared with interested stakeholders (including fisherfolk) to obtain and record their views.

(continuation)

- (c) ADB will review the results of the study, including the advice of its specialist marine consultant and, in consultation with CGPL, will determine if any further action is appropriate. ADB shall consult with the CRP on any further action.
- (d) The results of the automatic temperature monitoring device at the outflow channel to be made accessible to the public.
- (e) ADB to advise CGPL appropriately on ongoing qualitative studies (i) to identify the fisherfolk who have practiced foot fishing on a regular basis in the creek and coastal area adjoining the outflow channel; and (ii) to assess any livelihood impacts on such identified foot fisherfolk for the purpose of preparing a Livelihood Improvement Plan in consultation with the identified foot fisherfolk (with disclosure of the plan in the local language). ADB shall provide the TOR for the qualitative studies and the results thereof to the CRP for its review and comment.
- (f) ADB to provide the draft Livelihood Improvement Plan to the CRP for its review and comment prior to finalization and implementation.
- (g) Review of the Livelihood Improvement Plan to be carried out by an independent expert for ADB.

(See Appendix 1 for the full text of the Management's Remedial Action Plan.)

21. **CRP findings regarding compliance with Action No. 2. NIO report - Action items (a)-(c).** The NIO has completed its report in 2016¹⁵ and the CRP has provided its comments. The objectives of the study were: (i) to establish thermal dispersion from the discharge mouth; (ii) to establish temperature variations in and around the outfall channel due to the cooling water discharge by direct measurement; and (iii) to confirm model behavior through field monitoring. The study concludes that near ambient temperatures are attained at a distance of around 600 m from the mouth of the outfall channel during April 2015. The study also concludes that there are no impacts on the marine ecology. The CRP has serious reservations about the methodology and the results of this study and has presented a summary of its comments in para. 19 of the first CRP annual monitoring report. Study results build on an imprecise definition of the ambient temperature, and data of the study show that temperature variations over 1°C can be observed even 2 km from the channel mouth in the westward direction along the Modvha shoreline. Temperature impacts may thus be broader than the 600 m from the mouth of the outfall channel concluded in the study. Most importantly, the mathematical modelling reported in the NIO report does not appropriately describe the dispersion of the thermal plume. Model results presented do not show temperature transport across the channel until the water with the elevated temperature reaches the channel mouth. Thus, the model fails to measure impacts on the nearshore areas of Tragadi *bander* and the Modvha shoreline to the west of the outfall channel. At the same time, there are insufficient measurement points available in these areas to establish the temperature impacts. The CRP also made observations on the methodology on the marine impact assessment. (See para. 20 of the first CRP annual monitoring report.)

¹⁵ National Institute of Oceanography. 2016. Model Conformity Study and Monitoring for Condenser Cooling Water Discharge from CGPL in the Coastal waters of Mundra during premonsoon available at <http://tatapower.com/cgpl-mundra/pdf/NIO-report.pdf>

22. Subsequent to the comments provided by the CRP, technical experts from the CRP and ADB designed a program for additional monitoring and measurement which would further define (i) the extent of zone of elevated temperature as a result of cooling water discharge, and (ii) ecological impacts on nearshore marine environment. The scope of the additional monitoring was prepared in a collaborative effort and ADB submitted to the CRP a technical note in November 2016 entitled 'Proposed Thermal and Ecological Monitoring in Coastal Waters fronting the CGPL Plant' detailing the scope of additional thermal and ecological monitoring and measurement, for review and comments. Soon after, CGPL requested another round of discussions with experts of NIO and experts from ADB and the CRP which was held in March 2017. Unfortunately, the CRP was informed by ADB Management and by CGPL during its monitoring mission that CGPL was not prepared to carry out any additional data collection and measurements. CGPL informed the CRP that, with the finalization of the NIO study, it considers its obligations concerning assessments of impacts as completed. CGPL is of the view that there is adequate evidence that there are no impacts on marine biology from the elevated temperature of the outfall channel. Moreover, CGPL informed the CRP during its monitoring mission that CGPL, itself, carries out temperature monitoring at the channel mouth once a month, carries out plankton monitoring and is engaged in an experimental fish catch program in the channel. However, the CRP was informed by ADB Management that CGPL was not prepared to share this monitoring data with the CRP, as CGPL did not consider this as part of their obligation.

23. **Automatic Temperature Monitoring Device – Action (d).** CGPL has installed an automatic temperature monitoring device at the weir of the outflow channel and is displaying measurement results at the public information board at the main entrance.

24. **Livelihood Improvement Plan – Action Items (e)-(f).** The CRP had received in 2016 a draft livelihood improvement plan which it found, in principle, well prepared. The CRP presented its comments on the draft livelihood improvement plan and the first CRP annual monitoring report made a number of observations.¹⁶ The first CRP annual monitoring report noted three concerns of the CRP below.

- (i) The draft livelihood improvement plan identified 24 *pagadiyas* who regularly fish in the vicinity of the outfall weir and who were identified based on a survey in an area limited to 1.5 km around the outfall channel, assuming that the impact of the channel would be limited to 1.5 km. The CRP is of the view that the area of impact could possibly be larger than the 1.5 km assumed, as lateral currents, which were not considered in the NIO study, could possibly result in increased temperature along the Modvha shore. (See para. 22.) If additional temperature measures would show that there are impacts, additional surveys would need to be conducted in order to identify whether there are *pagadiyas* regularly fishing in these areas which then would need to be included into the group of *pagadiyas* to be compensated.
- (ii) The Livelihood Improvement Plan provides for compensation for the period 2012-2016. The CRP is of the view that in addition to the compensation paid for this period, a program of developmental measures needs to be incorporated into the livelihood improvement plan, which would support *pagadiyas* so that they can earn supplemental incomes to compensate for continued shortfalls experienced from fishing.

¹⁶ See para. 24 of First CRP Annual Monitoring Report.

- (iii) The CRP is of the view that the names of the 24 *pagadiyas* should be posted on the CGPL website (and possibly the ADB website) and that the methodology on how these *pagadiyas* were selected should be explained.

25. As the CRP was informed that CGPL was not prepared to conduct any additional measurement and impact assessments as proposed by the ADB and CRP experts, the CRP cannot conclude that all impacted *pagadiyas* have been identified and have been adequately compensated. (See para. 23.) Only after the additional measurements or other alternative assessment had been conducted, would there be certainty that the area of impact is limited to the parameters identified in the NIO study. The CRP, in its first annual monitoring report, had proposed to implement the compensation payments for the 24 identified *pagadiyas*, but to assess whether there are additional *pagadiyas* impacted, based on the additional monitoring data collected and measurement. Without such additional data collection and measurement, this final assessment on people impacted cannot be carried out.

26. The CRP has received a revised “Livelihood Improvement Plan for Identified *Pagadiya* Fishermen” (dated April 2017) through ADB Management.¹⁷ This revised plan incorporates provisions of the draft plan but adds, among others, a paragraph on the long-term program for development measures. The revised Plan identifies two shrimp farms as programs which would provide long term support to impacted *pagadiyas*. The shrimp farms would be set up as equity investments where all of the members of the VDACS of Modvha and Tragadi villages would obtain equity shares. CGPL would make the capital investments in the shrimp farms; the shrimp farms were to be operated by the two VDACS; and if the shrimp farms were to become profitable, in due course, all equity owners could receive dividends. As the number of equity owners would be large – according to information provided by CGPL each of the two shrimp farms would have more than 100 equity owners – the dividends distributed to each owner would remain small even if the shrimp farms became highly profitable. Dividend payments made to each *pagadiya* are highly unlikely to approximate the annual income loss of about Rs. 32,000 per annum which has been estimated as income loss for the *pagadiyas*. The shrimp farm would only provide employment to a few laborers and *pagadiyas* would not have a preferential access to these positions.

27. Other than the equity participation in the shrimp farm, the revised livelihood plan lays out that “CGPL has committed to work closely with the government agencies to ensure that foot fisher folk receive subsidies that they are entitled to, but have not been availing due to lack of awareness. The benefits likely to be facilitated by CGPL and VDAC through the government agencies include (i) fishing nets, (i) insulation box, (iii) bicycle, and (iv) weighing scale.”¹⁸

28. The CRP has been briefed during its monitoring mission on the status of implementation of the Livelihood Improvement Plan by both, CGPL management, the 24 *pagadiyas* entitled to receive compensation, the VDACS and NGO charged with the implementation of the program. All parties confirmed that the full compensation has been paid, partly in cash and partly as equipment (fishing nets) as agreed upon by the *pagadiyas*. In addition, two payments have been made to families from the health fund. The CRP notes the timely implementation of the compensation payments under the Livelihood Improvement Plan for the period 2012 to 2016 and appreciates the attention given to the careful implementation of this compensation payment which is documented in the revised Livelihood Improvement Plan and has been confirmed during the meetings of the monitoring mission. The CRP wishes to congratulate both CGPL and ADB staff

¹⁷ See Livelihood Improvement Plan for Identified Pagadiya Fishermen, Submitted to Coastal Gujarat Power Limited by Swadeep, April 2017 available at <https://www.tatapower.com/pdf/cgpl-mundra/livelihood-improvement-plan.pdf>.

¹⁸ Footnote 17, page 15.

and Management, which provided support, for the quick and successful compensation payments for the 24 identified *pagadiyas* for the period 2012-2016.

Figure 3: CRP meeting with affected people



Source: Compliance Review Panel

29. While the CRP is pleased about the decisive implementation of the compensation program for the 24 *pagadiyas* for the period 2012-2016, the CRP remains concerned on two accounts:

- (i) not all *pagadiyas* impacted might have been identified as the area of impact could possibly be larger than assumed by the NIO study. There could possibly be impacts along the Modvha shoreline as the NIO study did not capture lateral impacts in its model. Only additional monitoring and measurements would show whether there are temperature impacts along the Modvha shoreline. However, the CRP was informed that CGPL decided not to undertake additional monitoring and measurements even if it will be funded by ADB; and
- (ii) the Livelihood Improvement Plan does not provide for a long-term development support activity which would enable *pagadiyas* to earn incomes comparable to income foregone from lower yields of *pagadiya* fishing resulting from impacts of the discharge channel. The revised Livelihood Improvement Plan presents the planned shrimp farms for Modvha and Traghadi villages as such a long-term development program. But these shrimp farms will not provide employment opportunities for *pagadiyas*. The only benefit for *pagadiyas* would be dividend payments which would be distributed to all equity holders in the shrimp farm if in due course the shrimp farm becomes profitable and if dividend payments will be authorized. As all VDAC members would become equity owners and there are more than 100 members in each village, the dividend payment to each *pagadiya* would remain very small even if the shrimp farms become highly profitable. Given the very large number of equity owners, it is not possible to envisage that dividends paid out to each equity owner would reach anywhere the amounts estimated in the draft livelihood improvement plan as yearly income forgone by *pagadiyas* as a result of impacts of the discharge channel. The CRP recognizes that CGPL should not be asked to continue to pay annual compensation to *pagadiyas* for an unlimited time. But a livelihood support program which compensates *pagadiyas* for reduced

fish yields, needs a long-term development program, which would enable *pagadiyas* to earn – in due course – an amount which would be remotely comparable to the amounts lost. To achieve that objective, a program needs to be designed which would be tailored to *pagadiyas* (or at least one in which *pagadiyas* would be prominently included), which would provide them support, for example, through microcredit or other training and development measures, which would allow them to conduct their fishing more efficiently (and thus earn higher incomes) or to pursue alternative employment earning opportunities. An equity participation scheme alone is not likely to achieve this objective.

30. **CRP conclusions regarding compliance with Action No. 2.** The CRP finds that Action No. 2 is partially complied with. The following measures need to be undertaken to reach full compliance:

- (i) follow-up measures to the NIO study, defined by ADB and agreed with CRP, need to be implemented in order to assess whether there are additional areas of impacts resulting from water discharge of the outflow channel;
- (ii) if there are additional areas of impacts, a survey needs to be undertaken to establish whether there are *pagadiyas* active in these additional areas of impacts; and
- (iii) the Livelihood Improvement Plan needs to be complemented by developmental programs for the identified *pagadiyas* so that they can improve their income earning opportunities over time. The program components need to be identified, targets established, and progress monitored.

C. Sludge Treatment and Disposal

Status of Compliance: The CRP has closed this action point.

Management's Action Plan No. 3: Action to address ADB's noncompliance in relation to CRP's findings on sludge treatment and disposal¹

- (a) Since this issue was discovered (in December 2013), ADB has engaged with CGPL on environmentally sound ways in which to segregate the iron bearing sludge from the demineralization plant. The options for segregation of sludge and its disposal are currently under technical evaluation.

On completion of the technical evaluation of options, ADB will consult with the CRP on the preferred option prior to finalization of preferred option.

- (b) Implement sludge treatment and disposal measures and discontinue discharging iron-bearing sludge into the sea water via outfall channel.

(See Appendix 1 for the full text of the Management's Remedial Action Plan.)

31. **CRP findings regarding compliance with Action No. 3.** The CRP's compliance review report found that the CGPL undertakes dilution by cooling water discharge in order to remain within the required water quality standards with respect to iron.¹⁹ At the time of the compliance review mission, CRP had agreed with CGPL that the iron-bearing sludge would not be disposed into the discharge channel, but that CGPL would disconnect the sludge line from the reverse osmosis reject line, and to connect it to the fly ash pond, to avoid any disposal of sludge into the sea. This option has since been found impossible by CGPL as the Gujarat Pollution Control Board (GPCB) does not allow disposal of the iron-bearing sludge into the fly ash pond. The CRP during its second monitoring mission had a meeting with GPCB again and was informed that such iron-bearing sludge discharged by the desalinization facility of the Project is not classified as chemicals or hazardous waste under national environmental legislation and regulations. Therefore, disposal of the iron-bearing sludge into the discharge channel is allowed. Accordingly, the CRP decided to close this action item.

32. **CRP conclusions regarding compliance with Action No. 3.** Action item is closed.

D. Access Restrictions

Status of Compliance: ADB is in full compliance with this action.

Management's Action Plan No. 4: Action to address ADB's noncompliance in relation to CRP's findings on access restrictions¹

- a) Subsequent to the CRP findings, ADB investigations indicate that actions taken by CGPL (including identification of and consultations with affected persons and the measures taken to address the impacts of such access restrictions) adequately address the impacts of access restrictions to Tragadi *bander*. ADB will submit these findings to CRP for their review and comments.
- b) The ADB's findings in relation to access restriction issue will be translated into local language and consultations with the relevant stakeholders held.
- c) Based on the CRP's review of ADB's findings, if any further action is required, such action will be determined by ADB. ADB will ensure the implementation of such action.
- d) The surface quality of the access road to Tragadi *bander* for uninterrupted access during the monsoon to be maintained.

(See Appendix 1 for the full text of the Management's Remedial Action Plan.)

33. **CRP findings regarding compliance with Action No. 4.** The first CRP annual monitoring report considered this action item in full compliance provided that the present level of services (i.e., drinking water, health, and education services) continue to be provided to the fisherfolk at Tragadi *bander* at adequate levels and that the road surface continues to be adequately maintained. The CRP visited the *bander* and talked to a number of families. The CRP also met with the NGO which is charged by CGPL with the implementation of the social services program. The CRP found the social services adequate to compensate for the incremental travel

¹⁹ Footnote 10, paras. 67 and 68.

time which results from the longer access route to the *bander*. The CRP found the access route in acceptable condition so that vehicles can travel to the *bander*. Families which were consulted by the CRP during its visit at the *bander* confirmed that CGPL provides a number of services to the fisher families living at the *bander* during the fishing season and expressed their appreciation.

Figure 4: Portion of the access road to Tragadi *bander*



Source: Office of the Compliance Review Panel

34. **CRP conclusion on compliance with Action No. 4.** This action item is fully complied with.

E. Ambient Air Quality

Status of Compliance: At the time of this report, ADB is in partial compliance with this action.

Management's Action Plan No. 5: Action to address ADB's noncompliance in relation to CRP's findings on ambient air quality

- a) Air quality monitoring (involving 10 monitoring stations at all villages within the Project's airshed) was established in April 2014 and will continue to be carried out for a two-year period.
- b) Undertake a study in the villages surrounding the Project to ascertain the extent of health
Source: Compliance Review Panel
- c) With respect to particulates, a technical study to be undertaken (to be carried out by an independent consultant engaged in consultation with ADB) to ascertain the contribution of the Project to ambient PM₁₀ levels within the Project's airshed.

(See Appendix 1 for the full text of the Management's Remedial Action Plan.)

35. **CRP findings regarding compliance with Action No. 5.** ADB has carried out an Analysis of Ambient Air Quality, Stack Emissions and Metrological Parameters within 10 km radius of the Tata Mundra Plant. The CRP has submitted its comments to ADB Management on 10 March 2017. The study also includes correlation analysis of ambient air quality and stack emissions. The study shows that there has been a significant increase of PM₁₀ levels in the

surroundings of the CGPL plant. The PM₁₀ annual average increased by about 25% at the Tunda and Tragadi villages over the last 10 years (2006-2015). For Mota Kandagara, the percentage increment was even larger at 46%. Vandh village, located right next to the CGPL plant, is most immediately impacted by PM₁₀ emissions during all seasons and mainly from fugitive emission sources of CGPL plant and other adjacent industries located 1.5 km away from the CGPL plant. However, the report states that the primary source for PM₁₀ emissions are localized sources and not the CGPL plant. For the Vandh village, the CGPL coal yard is estimated to contribute between 8%-17% of measured PM₁₀ concentration for different seasons. As to stack emissions, the report notes that CGPL contributions are low across the airshed amounting to 0.4%-4.9%.

36. The CRP concurs with the methodology applied to assess the impacts. However, the CRP is concerned about the poor quality of the data on which the assessments are based. Given the incomplete data source, the results of the study may be unreliable. The report recognizes that very high instrument downtime was observed for the hourly data on suspended particulate matters, mostly due to poor support from the supplier. CGPL has one bi-flue and another tri-flue stacks and Adani Power Limited has 3 bi-flue and 1 tri-flue stacks. Stack kit calibration from CGPL had several downtime during operations which caused large gaps in hourly emissions for PM₁₀ data. Due to instrument downtime, very high percentage of hourly emission data for PM₁₀ was not available. Due to high fluctuations in the value of coefficient of variance in the stack emission data, average emission data should not be considered for the quantitative air impact assessment study. The CRP is of the view that such quantitative correlation impact assessment carried out with data where there are large data gaps, is unlikely to produce reliable results.

37. In light of the concerns expressed on the data, the CRP requests that the results of the air quality study need to be further verified. Moreover, the CRP notes, that the CGPL coal yard and stacks are major contributors to ambient PM₁₀ concentration at Vandh, Tunda, and the CGPL main gate during winter and post-monsoon seasons. During summer season, PM₁₀ concentration at Vandh village are almost equal. These results show that the wind barrier erected has little mitigation impact on fugitive emissions. Therefore, additional mitigation measures are required by CGPL to protect Vandh village from the very high PM₁₀ emissions.

38. The CRP notes that a summary of the study needs to be translated into local language and shared with local communities and other shareholders. As of the time of the monitoring mission, study results have not been shared with stakeholders and their views have not been taken into account.

39. CGPL continues to carry out air quality monitoring. However, the air quality study provides a number of recommendation on how air quality monitoring performance as well as reporting be adjusted. The study also recommends that a third party annual audit be conducted on air quality monitoring. The CRP suggests that these recommendations be taken into account to improve air quality monitoring.

40. Moreover, CGPL has conducted a Baseline Health Profile with Respect to Air Quality in Airshed of the CGPL Power Plant.²⁰ The study submitted to the CRP for review is a baseline study which has as its objective to (i) create a health baseline data; (ii) assess the prevalence of respiratory diseases among children under 4 and adults above 50 years old; (iii) establish the prevalence of cardiovascular diseases among population 40 years and above; (iv) understand possible reasons of symptoms leading to death, and (v) be able to measure, in future, the health

²⁰ A Baseline Health Profile with Respect to Air Quality in Airshed of CGPL Power Plant by TALEEM Research Foundation, 22 July 2016.

impacts of emissions of nearby power plants. In its design, the study is thus not fully responsive to Action No. 5 (b) of the RAP, which calls for a study to ascertain the health impacts related to PM₁₀ and PM_{2.5}. The RAP calls for an impact assessment specifically tailored to diseases associated with PM_{2.5} and PM₁₀. What the study completed is primarily a health baseline with some observations provided on the health status of the population in the airshed in comparison to a control group located outside the airshed. CGPL considered it necessary to first complete a baseline. CGPL is of the view that impacts should be assessed in a follow up study which is tentatively planned within 5 years.

41. In its comments, the CRP expressed concern about the very limited sample size, especially in respect to respiratory diseases of children. Only 14 children were identified as affected by respiratory diseases in villages located within the airshed compared to 2 children in the 2 control villages. Of the 14 children identified as affected by respiratory diseases, only 7 children were clinically examined. This sample size is too small to draw robust conclusions and to establish a baseline. This is regrettable as the most immediate health impact of elevated levels of PM₁₀ and PM_{2.5} are respiratory diseases among the young and elderly. The very small sample size will limit the utility of the study as a health baseline and limits the utility of the study to draw preliminary conclusions by comparing the health status of the population living within the airshed with the control group living outside the airshed.

42. The CRP also is of the view, that in the health survey, particular attention needs to be given to Vandh, Tragadi, and Tunda villages, which have all been identified in the Air Quality Study as locations with high PM₁₀ impacts. As randomized stratification techniques have been applied in the health study, no child was identified as affected by respiratory diseases in Vandh village, as the population size of Vandh village is small and thus the group selected for survey was very small. But clearly Vandh is highly impacted by PM₁₀ and it is most unlikely that there are no children suffering from respiratory diseases which result from the high PM₁₀ level. The CRP is of the view, that a special monitoring program on the health status of people in Vandh village, and possibly also Tragadi and Tunda villages, be undertaken. The CRP concurs that conducting a follow up health survey in about 5 years, which would work with a larger sampling size, is an appropriate tool to assess health status and impacts for the people living in the airshed. But as not all villages located in the airshed are evenly impacted by the emissions of the CGPL plant, in addition to this general follow-up health survey to be conducted in 5 years, a special health monitoring program needs to be instituted now, at least for Vandh village, which will monitor the incidence of respiratory diseases which are induced by high PM₁₀ and PM_{2.5} levels.

43. **CRP conclusion regarding compliance with Action No. 5.** This action item is in partial compliance. In order to achieve full compliance, the following measures should be taken:

- (i) further verification on the results and conclusions of the study titled 'Analysis of Ambient Air Quality, Stack Emissions and Metrological Parameters within 10 km radius on the Tata Mundra Plant', incorporating the comments presented by the CRP;
- (ii) translation of a summary of the study in local language; distribution of summary and consultation with local population and relevant shareholders; posting of summary of study on CGPL and ADB websites;
- (iii) implementation of additional mitigation measures to reduce impacts caused by CGPL plant from coal yard and stack emissions on Vandh village to reduce exposure to PM₁₀;

- (iv) implementation of recommendations of Air Quality study to improve CGPL air quality monitoring and reporting;
- (v) implementation of a follow-up health survey to assess health related impacts of PM₁₀ and PM_{2.5} with a 5-year period using an adequate sample size; and
- (vi) special health monitoring with a focus on respiratory diseases at Vandh village.

VI. CONCLUSION

44. The CRP notes in this second annual monitoring report that further progress has been made in the implementation of action items 5 (air quality and related health impacts). The drafts of two important studies have been completed, one, the Analysis of Ambient Air Quality, Stack Emissions and Metrological Parameters within 10 km radius of CGPL, and, two, the Baseline Health Profile with Respect to Air Quality in the Airshed of the CGPL Power Plant. The CRP is pleased about the completion of these draft studies, the CRP provided its comments and looks forward to the revised studies incorporating the observations of the CRP, and the dissemination of the summary of studies in local language through ADB and CGPL websites.

45. As to action item 2, the CRP is pleased about the decisive implementation of the compensation program provided to the 24 identified *pagadiyas* for the period 2012 and 2016. Based on information provided to the CRP, the implementation has been conducted in a professional and inclusive manner. The CRP wishes to express appreciation for this timely implementation to both, CGPL and ADB staff and Management. The CRP is concerned that no agreement could be reached to design a developmental program for *pagadiyas* which would allow them to develop income earning opportunities to replace income foregone from *pagadiya* fishing for the period beyond 2016. The CRP is of the view that an equity shareholding in a shrimp farm – even if highly profitable – would not compensate *pagadiyas* for income foregone as, due to the large number of equity owners, paid out dividends would not be sufficient to compensate for losses. The CRP does not consider this investment as a developmental investment tailored towards the *pagadiyas* which would empower them to gain alternative incomes. The CRP is further disheartened about the the lack of agreement to carry out additional measurements and assessments to complement the NIO study. Such measurements appear essential to gauge the full extent of impacts of the thermal discharge system. The CRP notes that ADB staff and Management have made significant efforts to lay out a program of additional monitoring and measurements and ADB has expressed its willingness to fund such additional measurements. As it is the task of the CRP to assess the progress made by ADB in the implementation of the RAP, the CRP wishes to note in this second annual monitoring report, that it is of the view that ADB has made important efforts to advance on action points 2 (a-c).

46. As to action item 3 the CRP notes that the GPCB has provided assurances that discharging of the iron-bearing sludge into the open discharge channel is acceptable under national environmental legislation and regulations. The CRP thus considers this action item closed. Action item 3, continues to remain in full compliance. The CRP is discouraged about the lack of progress on disclosure and consultation measures under action item 1 and notes that very limited progress on this has been made since the first CRP annual monitoring report.

47. The CRP finds that overall progress in the implementation of the RAP since the last monitoring report has at best been mixed and in some areas, further progress seems to have stalled. However, the CRP wishes to express recognition for the careful attention given by ADB

staff and Management in supporting the implementation of the RAP. The CRP found ADB staff and Management actively engaged in supporting and monitoring the implementation of the RAP.

48. The table below summarizes the CRP's recommendations to ADB Management on actions to bring the Project into full compliance.

Management's Action Plan Topic	Feedback to Management on Actions to Bring the Project into Full Compliance
1) Disclosure of information and conduct of consultations	<p>Status of compliance: Partial Compliance</p> <p>The CRP suggests that the following actions be taken:</p> <ul style="list-style-type: none"> (i) post access study on ADB and CGPL websites; (ii) translate into local language the summary of the technical study on air quality, disclose this summary and consult with relevant stakeholders. Disclose the summary on ADB and CGPL websites; and (iii) the CRP strongly suggests that ADB Management encourages CGPL to post the names of the 24 <i>pagadiyas</i> selected for livelihood support, together with the methodology according to which they were selected and the grievance mechanism on where to file grievances on ADB and CGPL websites.
2) Thermal Discharge from the Outflow Channel and Loss of Livelihood of Fisherfolk	<p>Status of compliance: Partial Compliance</p> <p>The CRP suggests that the following actions be taken:</p> <ul style="list-style-type: none"> (i) follow-up measures to the NIO study, defined by ADB and agreed with CRP, need to be implemented in order to assess whether there are additional areas of impacts resulting from water discharge of the outflow channel; (ii) if there are additional areas of impacts, a survey needs to be undertaken to establish whether there are <i>pagadiyas</i> active in these additional areas impacts; and (iii) the Livelihood Improvement Plan needs to be complemented by developmental programs for the identified <i>pagadiyas</i> so that they can improve their income earning opportunities over time. The program components need to be identified, targets established, and progress monitored.
3) Sludge Treatment and Disposal	<p>Status of compliance: Action item is closed by CRP.</p> <p>The CRP considers this action item closed as Gujarat Pollution Control Board (GPCB) confirmed to CRP that disposal of iron-bearing sludge into the discharge channel is acceptable in accordance with national environmental legislation and regulations.</p>
4) Access restrictions	<p>Status of compliance: Full compliance</p> <p>The CRP considers this action in full compliance assuming that services (i.e., drinking water, health and education services) are continued to be provided at adequate levels to the <i>Tragadi bander</i></p>

Management's Action Plan Topic	Feedback to Management on Actions to Bring the Project into Full Compliance
	people to compensate for increased costs resulting from longer access road. Full compliance also assumes that the access road will continue to be adequately maintained.
5) Ambient air quality	<p>Status of compliance: Partial Compliance</p> <p>The CRP proposes that the following actions be taken by ADB Management:</p> <ul style="list-style-type: none"> (i) further verification on the results and conclusions of the study titled 'Analysis of Ambient Air Quality, Stack Emissions and Metrological Parameters within 10 km radius on the Tata Mundra Plant', incorporating the comments presented by the CRP; (ii) translation of a summary of the study in local language, distribution (and consultation with local population and relevant shareholders, posting of summary on CGPL and ADB websites; (iii) implementation of additional mitigation measures to reduce impacts caused by CGPL plant from coal yard and stack emissions on Vandh village to reduce exposure to PM₁₀; (iv) implementation of recommendations of Air Quality study to improve CGPL air quality monitoring and reporting; (v) implementation of a follow-up health survey to assess health related impacts of PM₁₀ and PM_{2.5} with a 5-year period using an adequate sample size; and (vi) special health monitoring with a focus on respiratory diseases at Vandh village.

/S/ Dingding Tang

Chair, Compliance Review Panel

/S/Arntraud Hartmann

Part-time Member, Compliance Review Panel

Manila, Philippines

16 August 2017

MANAGEMENT'S REMEDIAL ACTION PLAN

INDIA: MUNDRA ULTRA MEGA POWER PROJECT (LOAN 2419-IND)

Updated remedial action plan

On 3 June 2015, Management submitted its proposed remedial action plan to the Board pursuant to paragraph 191 of the Accountability Mechanism Policy (2012) ("**AM Policy**").

This document outlines ADB Management's proposed updated remedial action plan ("**Action Plan**") which takes into account the comments of the Compliance Review Panel ("**CRP**") received on 2 June 2015. This Action Plan supersedes the remedial action plan previously submitted by Management to the Board.

In accordance with paragraph 190 of the AM Policy, the borrower has agreed on 19 June 2015 to the remedial actions.

Introduction

On 9 March 2015, the CRP submitted its final report ("**CRP Report**") in relation to the above project ("**Project**") in which it found Asian Development Bank ("**ADB**") non-compliant with certain of its operational policies and procedures in four respects: (i) failure to adequately disclose information and conduct consultations; (ii) loss of livelihood of fisherfolk (due to thermal discharge from the outflow channel and impacts on Modhva Creek); (iii) access restrictions to fishing grounds; and (iv) ambient air quality.

This document outlines ADB Management's proposed remedial action plan ("**Action Plan**") which is submitted to ADB's Board for its consideration pursuant to paragraph 191 of the Accountability Mechanism Policy (2012) ("**AM Policy**")

Management acknowledges that, in a number of instances, the Action Plan requires further studies to be carried out, which will determine future actions that may be required to bring the Project back into compliance. Management will share these studies with the CRP and will seek the CRP's input prior to finalization of the studies and determination of the future actions.

The Action Plan is set out in Appendix 1 and includes the actions (including timelines) to bring the Project into compliance with ADB's relevant policies. Management accepts that responsibility to take all the required measures to bring the Project back into compliance with ADB's policies lies squarely with ADB's Management. The action to implement such measures 'on the ground' will be undertaken by Coastal Gujarat Power Limited ("**CGPL**"), ADB's borrower for the loan, unless otherwise indicated in the Action Plan. This action

will include the engagement of a qualified NGO with relevant experience to assist ADB to undertake consultations with the local community (as specifically outlined in Appendix 1).

ADB acknowledges the ongoing cooperation of CGPL in addressing the various issues which have arisen from ADB's noncompliance with its policies, which demonstrates CGPL's strong corporate responsibility ethos, which was also acknowledged by the CRP in the CRP Report. Management is positive that, with the support of CGPL, ADB can implement the Action Plan effectively and within the required timeline. A summary of cost estimates in relation to the actions is set out in Appendix 2.

Appendix 3 sets out the corrective actions that have been taken and are on-going in relation to coal dust. This appendix is included so that this document provides a complete picture of all on-going measures. Appendix 3 does not constitute a formal part of the Action Plan since the CRP found ADB in compliance with its policies in relation to coal dust.

Implementation Timelines

The proposed Action Plan is to be implemented over a period of three (3) years up to September 2018 (whilst noting that certain actions have already commenced and are ongoing). During this period, ADB will provide the CRP with reports of further studies to be undertaken as stated in the Action Plan; will monitor the implementation of the actions on an on-going basis; and will submit quarterly progress reports during the first two years and then subsequently semi-annual progress reports to the CRP at the end of June and December of each year.

ADB's reports to the CRP will detail, for each item below, the latest status of the actions taken, in progress or to be taken, referencing the scheduled dates (including any updates) specified in the Action Plan. The objective of this quarterly / semi-annual reporting by ADB will be to assist the CRP in carrying out its monitoring and reporting to the ADB Board on the status of the implementation of the Action Plan pursuant to paragraphs 192 – 194 of the AM Policy.

ADB's progress reports will be publicly disclosed on ADB's website. The CRP's monitoring reports will be publicly disclosed on ADB's website pursuant to paragraph 3 (viii) of Appendix 9 of the AM Policy.

APPENDIX 1

PROPOSED ACTION PLAN

Note: All scheduled dates (unless otherwise stated) are for the completion of the relevant action by the end of the specified month.

1. Action to address ADB's noncompliance in relation to CRP's findings on disclosure of information and conduct of consultations¹		Scheduled date
(a)	Inclusive and transparent stakeholder consultations will be carried out to establish and address the impacts of the Project in relation to (i) thermal discharge into the outfall channel; (ii) livelihood of foot fisherfolk; (iii) access restrictions ² ; and (iv) ambient air quality, as detailed in this Action Plan. As part of this consultative process, the affected foot fisherfolk will be identified; information on their livelihoods will be collected and impacts will be assessed; and measures to address livelihood impacts will be established in a Livelihood Improvement Plan, as detailed in this Action Plan.	See relevant tables below.
2. Action to address ADB's noncompliance in relation to CRP's findings on thermal discharge from the outflow channel and loss of livelihood of fisherfolk³		Scheduled Date
(a)	<p>The National Institute of Oceanography ("NIO") has been engaged by CGPL⁴ and is carrying out field observations on the actual impacts of thermal discharge from the Project in Modhva Creek and adjoining coastal areas; this will involve validating the thermal modelling previously carried out by HR Wallingford during the environmental due diligence (prior to Project approval). NIO will complete this model conformity study.⁵</p> <p>Findings of the draft NIO report to be reviewed by ADB (engaging external specialist marine consultant). ADB will submit to the CRP, as soon as available, for review and comment the draft study prepared by NIO.</p>	October 2015

¹ This corresponds with Findings 'A 1 and 2' of the CRP's Report (pages 10 – 20).

² Fisherfolk in the Modhva and Tragadi villages were recognized in 2009 as affected by access restrictions to Tragadi bander. The CRP notes (in paragraph 127 of its report) that a participatory, inclusive consultation process started and livelihood support measures were introduced for these particular villages, and that which ADB staff supported CGPL's significant engagement in the consultations conducted in these villages.

³ This corresponds with Findings 'B 1 and B5' of the CRP Report (pages 21 – 26 and 31 – 33).

⁴ The NIO study is a requirement of the MOEF clearance dated April 2008.

⁵ NIO was engaged in 2013, as an expert institute to undertake this study. The first set of field investigations under this study were completed in December 2013 and a report was submitted in September 2014. Another field investigation has been completed in April 2015 and a draft report is under preparation.

1. Action to address ADB's noncompliance in relation to CRP's findings on disclosure of information and conduct of consultations¹		Scheduled date
(b)	Summary of the NIO report to be translated into the local language and shared with interested stakeholders (including fisherfolk) to obtain and record their views.	February 2016
(c)	ADB will review the results of the study, including the advice of its specialist marine consultant and, in consultation with CGPL, will determine if any further action is appropriate. ADB shall consult with the CRP on any further action.	March 2016
(d)	The results of the automatic temperature monitoring device at the outflow channel to be made accessible to the public.	Ongoing
(e)	<p>ADB to advise CGPL appropriately on ongoing qualitative studies (i) to identify the fisherfolk who have practiced foot fishing on a regular basis in the creek and coastal area adjoining the outflow channel; and (ii) to assess any livelihood impacts on such identified foot fisherfolk for the purpose of preparing a Livelihood Improvement Plan in consultation with the identified foot fisherfolk (with disclosure of the plan in the local language). ADB shall provide the TOR for the qualitative studies and the results thereof to the CRP for its review and comment.</p> <p>ADB to provide the draft Livelihood Improvement Plan⁶ to the CRP for its review and comment prior to finalization and implementation.</p>	October 2015
(f)	Implementation of Livelihood Improvement Plan for the identified foot fisherfolk.	October 2015 - July 2018
(g)	Review of the Livelihood Improvement Plan to be carried out by an independent expert for ADB.	June 2018 (for production of independent expert report)

⁶ The Livelihood Improvement Plan will consider short term and long term options to address past and future impacts. The final Livelihood Improvement Plan will be disclosed on ADB's website.

3. Action to address ADB's noncompliance in relation to CRP's findings on sludge treatment and disposal⁷		Scheduled Date
(a)	Since this issue was discovered (in December 2013), ADB has engaged with CGPL on environmentally sound ways in which to segregate the iron bearing sludge from the demineralization plant. The options for segregation of sludge and its disposal are currently under technical evaluation.	October 2015
	On completion of the technical evaluation of options, ADB will consult with the CRP on the preferred option prior to finalization of preferred option.	December 2015
(b)	Implement sludge treatment and disposal measures and discontinue discharging iron-bearing sludge into the sea water via outfall channel.	June 2016
4. Action to address ADB's noncompliance in relation to CRP's findings on access restrictions⁸		Scheduled Date
(a)	Subsequent to the CRP findings, ADB investigations indicate that actions taken by CGPL (including identification of and consultations with affected persons and the measures taken to address the impacts of such access restrictions) adequately address the impacts of access restrictions to Tragadi bander. ADB will submit these findings to CRP for their review and comments.	Report August 2015
(b)	The ADB's findings in relation to access restriction issue will be translated into local language and consultations with the relevant stakeholders held.	October 2015
(c)	Based on the CRP's review of ADB's findings, if any further action is required, such action will be determined by ADB. ADB will ensure the implementation of such action.	December 2015
(d)	The surface quality of the access road to Tragadi bander for uninterrupted access during the monsoon to be maintained.	Regular maintenance for the life of the Project
5. Action to address ADB's noncompliance in relation to CRP's findings on ambient air quality⁹		Scheduled Date
(a)	Air quality monitoring (involving 10 monitoring stations at all villages within the Project's airshed) was established in April 2014 and will continue to be carried out for a two year period.	March 2016

⁷ This corresponds with Finding 'B 2' of the CRP Report (pages 26 – 29).

⁸ This corresponds with Finding 'C' of the CRP Report (pages 34 – 36).

⁹ This corresponds with Finding 'E' of the CRP Report (pages 41 – 46).

(b)	Undertake a study in the villages surrounding the Project to ascertain the extent of health impacts associated with air pollution (PM ₁₀ and PM _{2.5}).	December 2015 – July 2018
(c)	With respect to particulates, a technical study to be undertaken (to be carried out by an independent consultant engaged in consultation with ADB) to ascertain the contribution of the Project to ambient PM ₁₀ levels within the Project's airshed. ¹⁰	April 2016 (draft study)
(d)	Findings of the technical study to be made accessible to interested stakeholders, and technical study to be finalized taking into account their views. A summary of the technical study will be translated into local language and shared with local communities and other stakeholders. ADB will provide the CRP with the terms of references for the study and draft study report for its review and comments.	June 2016
(e)	Using the results of the ambient air quality monitoring and the technical study, ADB will undertake a correlation analysis of ambient air quality and stack emissions which will be used to determine, in consultation with CGPL, and relevant stakeholders, any further action in relation to ambient air quality monitoring and any control measures. ADB will submit the correlation analysis to CRP for its review and comment. Any further action in relation to ambient air quality monitoring and any control measures may include additional monitoring, plantation of trees and paving of internal roads within the villages if considered appropriate.	December 2016

¹⁰ This study will ascertain at all monitoring stations the proportion of PM₁₀ contributed by the Project. For this purpose, the study will involve undertaking physical and chemical analysis of particulates and their correlation with the characteristics of fly ash emissions and coal dust from the Project. This study therefore should demonstrate the Project's contribution towards particulate air pollution. This study therefore has significantly higher scientific rigor than a 'dust analysis' which could only indicate what proportion of the total dust comprises the various components of dust (fly ash, unburnt coal, airborne salt and silica) without being able to indicate the source of such dust.

APPENDIX 2**SUMMARY OF COST ESTIMATES FOR ACTION PLAN**

Action	Estimated Cost (in US Dollars equivalent)
Costs in carrying out required studies to identify affected foot fisherfolk and continued consultation with fisherfolk by NGO.	\$100,000
Engagement by ADB of specialist marine consultant to assess the results of the NIO study.	\$40,000
Implementation of Livelihood Improvement Plan for foot fisherfolk.	\$300,000 (to be finalized in the Livelihood Improvement Plan)
Engagement by ADB of independent expert to assess the implementation of the Livelihood Improvement Plan.	\$25,000
Design and implementation of sludge treatment and disposal measures.	\$150,000
Contingency amount in relation to any access issues, as specified in Appendix 1, Section 4, item (c) on page 6.	\$50,000
Annual maintenance of access road.	No additional cost as CGPL will carry out in any event
Third party monitoring of ambient air quality.	Ongoing, so no additional cost
Air quality study to ascertain the Project's contribution to particulate pollution in the airshed.	\$200,000
Engagement by ADB of technical support as required.	\$300,000

APPENDIX 3 – CORRECTIVE ACTION PLAN FOR COAL DUST ISSUES

Note: Appendix 3 does not constitute a formal part of the Action Plan since the CRP found ADB in compliance with its policies in relation to coal dust.

Corrective Action carried out to date includes:		
(i)	A tube coal conveyor belt covering the elevated 1.3 km stretch along the Vandh village has been designed (estimated cost of \$18,500,000).	
(ii)	In the future, a 20-50m wide “green belt” comprising rows of fast growing trees to break the wind and intercept coal dust will develop (planted in 2012).	
(iii)	A 9 m tall wind barrier has been constructed along the Vandh village-ward plant boundary, adjoining the coal stockyard to arrest the movement of coal dust.	
(iv)	The height of coal piles over one-third of the Vandh village-ward length has been restricted to below 6 m.	
Further Corrective Action ¹		Scheduled Date
(a)	Construction of the covered tube conveyor belt.	October 2016.
(b)	A water sprinkler system for the suppression of coal dust will be designed to throw a fine mist of water up to a height of 20 m along the width of the coal piles on the Vandh village-ward side to capture the coal dust that escapes over the 9 m tall wind barrier. Completed technical design of water sprinkler system to be submitted to ADB for review.	September 2015.
(c)	Implementation of water sprinkling system.	October 2016.
(d)	Until the above system has been implemented, during adverse wind condition periods (typically November – February), use (already installed) fire hydrants.=	October 2015.
(e)	The area underneath the present coal conveyor to be paved for more efficient removal of coal dust that falls through the conveyors to prevent its getting air borne during gusts and windy conditions.	March 2016.

¹ This corresponds with Finding ‘C’ of the CRP Report (pages 36 - 40).

LIST OF PERSONS MET DURING THE MONITORING

The Compliance Review Panel (CRP) met with the following persons within and outside the Asian Development Bank (ADB) in carrying out the monitoring of Management's remedial action for the Mundra Ultra Mega Power Project. This list is not exhaustive as it does not include names of affected persons who requested that their identities to be kept confidential.

ADB Staff

1. Michael Barrow, Director General, Private Sector and Operations Department (PSOD)
2. Craig Lee Roberts, Director, Portfolio Management Division (PSPM), PSOD
3. Mark Kunzer, Director, Private Sector Transaction Support Division (PSTS), PSOD
4. Vijay Joshi, Principal Environment Specialist, PSTS, PSOD
5. Samarendra Singh, Investment Specialist, PSPM, PSOD
6. Viswanathan Ramasubramanian, Senior Safeguards Specialist, PSTS

Coastal Gujarat Power Limited

1. Krishna Kumar Sharma, Executive Director and Chief Executive Officer
2. Arunachal Mudgerikar, Chief Sustainability Officer
3. Beujesh Singh, Chief, Operations and Maintenance
4. Pradeep Ghosal, Group Head, Community Relations
5. Amit Kumar Tyagi, Group Head, Environment
6. Amitava Dutta, Head, Ch & WS
7. Pramod Singh, Head, Fire and Safety
8. Khadse Tejas, Lead Associate-Environment
9. Saurabh Sharma, Senior Specialist, Community Relations
10. Harshal Desai, Lead Engineer, Operations and Maintenance

Requesters' Representative and Complainant

1. Bharat Patel
2. Gajendrasinh Bhimaji Jadeja

Gujarat Pollution Control Board

1. Kishor Mistry, Member Secretary
2. Sushil Vegda, Senior Environment Engineer

Others

1. Kalyan Danger, SWADEEP
2. H. S. Patel, Village Development Advisory Committee
3. Md. Irfan Khan, Director, TALEEM Research Foundation
4. Dalip Bora, TALEEM Research Foundation
5. Sapan Pandya, Industrial Health Consultant, TALEEM Research Foundation