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IMPLEMENTATION COMPLETION REPORT

INDIA

COAL MINING AND COAL QUALITY IMPROVEMENT PROJECT
(LOAN 2796-IN)

April 23, 1997

Energy and Infrastructure Operations Division
Country Department II
South Asia Region

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CURRENCY EQUIVALENTS

(As of March 31, 1996)

Currency units	=	Rupees (Rs)
One Rupee	=	US\$ 0.03 (approx.)
One US Dollar (US\$)	=	Rs 26.0 (average over life of project)

MEASURES AND EQUIVALENTS

1 metric ton of (Indian) coal	=	0.46 metric tons of oil
	=	1.9 metric tons of lignite
	=	570 cubic meters of natural gas
	=	1.0 metric ton of firewood
	=	2.0 metric tons of animal dung

FISCAL YEAR OF BORROWER

April 1 through March 31

ABBREVIATIONS AND ACRONYMS

CIL	-	Coal India Limited
CMPDI	-	Central Mine Planning and Design Institute
ECL	-	Eastern Coalfields Limited
GOI	-	Government of India
PAP	-	Project-affected person
SAIL	-	Steel Authority of India Limited
SECL	-	South Eastern Coalfields Limited

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(LOAN 2796-IN)Table of Contents

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IMPLEMENTATION COMPLETION REPORT

INDIA

COAL MINING AND COAL QUALITY IMPROVEMENT PROJECT (LOAN 2796-IN)

Preface

This is the Implementation Completion Report (ICR) for the Coal Mining and Coal Quality Improvement Project in India (Loan 2796-IN) for the amount of US\$340 million equivalent. The Board approved this loan on April 21, 1987 and it was declared effective on September 28, 1987.

The loan was closed on September 30, 1995, after a one year extension from the original closing date of September 30, 1994. Final disbursement took place on March 31, 1996 and a balance of US\$39,732,735 million was canceled effective as of April 11, 1996. Total disbursements amounted to US\$300,267,265.

The ICR was prepared by Dennis Bateman, Consultant Mining Engineer and reviewed by Jean-François Bauer, Division Chief, Energy and Infrastructure Operations Division and Kazuko Uchimura, Project Advisor, South Asia Country Department II (Bhutan, Nepal and India).

Preparation of this ICR was begun during the Bank's implementation completion mission in February and March 1996. It is based on material in the project file. The Borrower contributed to the preparation of the ICR by preparing their own evaluation of project execution and initial preparation. The Borrower's comments are included as an annex to the ICR.

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COAL MINING AND COAL QUALITY IMPROVEMENT PROJECT (LOAN 2796-IN)

Evaluation Summary

A. PROJECT OBJECTIVES

i. The project consisted of: (i) the procurement and import of approximately three million tons of coking coal for a total value of US\$160 million and (ii) the procurement of opencast mining equipment, infrastructure and technical assistance for the development of Eastern Coalfields Ltd's (ECL) Sonepur-Bazari opencast coal mine and the expansion of South Eastern Coalfields Ltd's (SECL) Gevra opencast coal mine. The main project objectives were to improve the quality of coal available to consumers, increase the supply of thermal coal to the power and industrial sectors and increase the supply of coking coal to the steel sector.

B. ACHIEVEMENT OF OBJECTIVES

ii. Objective (i) cannot be said to have been effectively achieved other than in consistency of product sizing. It is the application of 'good-housekeeping' practices that makes the difference between clean coal and dirty coal. The latter will typically contain rock, shale, and mud which reduce average calorific values and cause damage to equipment at power generating plants and increase ash disposal costs, as well as increase the cost of rail transport.

iii. Objective (ii) had mixed success. The expansion of production at SECL's Gevra mine in Madhya Pradesh has been highly successful. The expertise and enthusiasm of management, coupled with modern mining equipment partly supplied with Bank finance, resulted in achievement of the project target production of ten million tons per year two years ahead of program. The ECL Sonepur-Bazari mine in West Bengal, in direct contrast to the foregoing, had serious implementation problems, primarily concerned with the acquisition and possession of land. The present forecast is that the full mine output of three million tons per year will be achieved in FY1997/98, one year behind schedule.

iv. Objective (iii), designed to increase the supply of coking coal to the steel sector was achieved, as planned, in the initial few months of project implementation, by the import of some three million tons of high quality Australian coking-coal.

C. MAJOR FACTORS AFFECTING THE PROJECT

Gevra Mine

v. **Mine Development:** The expansion of SECL's Gevra project was implemented ahead of schedule. A large volume of coal was exposed far ahead of time, leading to spontaneous heating of coal and environmental pollution. Bank supervision missions consistently emphasized the hazards involved in this system and in 1994 it was finally abandoned.

vi. **Resettlement and Rehabilitation Issues:** Gevra required the acquisition of 3500ha of land, upon which there 968 families. SECL created four nearby resettlement villages with infrastructure. 923 families have been resettled, leaving 45 yet to be resettled as the mine progresses. Employment has been

provided to 1,828 project-affected people and re-training schemes have been implemented. Most resettlement was carried out prior to Bank involvement in this mine, which partly accounts for the relative lack of resettlement and rehabilitation problems.

vii. **Environmental Impact:** Measures are taken to minimize dust, noise and water pollution. Regular tests on water and air quality and noise levels show results well in compliance with mandated standards. However, the horizon mining method has prevented opportunities to place overburden below original ground level in areas where coal had been evacuated. The revised mining system is releasing areas which have been exhausted of coal and SECL is placing overburden in these areas.

Sonepur-Bazari Mine

viii. **Mine Development:** The implementation of ECL's Sonepur-Bazari mine in West Bengal had serious implementation problems, primarily acquisition and possession of land. The present forecast is that the full mine output of three million tons per year will be achieved in FY1997/98, one year behind plan. A significant result of the delays has been that the advance overburden excavation necessary to expose a strategic reserve of the coal seam has been overtaken, greatly reducing coal production flexibility. This overburden excavation and the mine geometry is being reestablished. In August 1995, the Bank mission discovered that the coal dispatch system was substantially altered from the original design. The Bank did not agree to this change because of its likely impact on the environment, and did not consider any further extension of the loan.

ix. **Resettlement and Rehabilitation Issues:** Implementation of this component was delayed by more than five years by a dispute between land owners and ECL. Even after prior written agreement on all points of compensation and resettlement detail, land owners demanded jobs with ECL and ECL, which is overstaffed and making heavy losses, was only prepared to offer what was prescribed by the law. At the request of the Bank ECL prepared a socio-economic survey and a Rehabilitation Action Plan based on the Gulla package. ECL was able to resolve the stalemate after the Bank urged cancellation of this component and the West Bengal government intervened. The move to the resettlement village was completed in May 1996.

x. **Environmental Impact:** As in the Gevra mine, precautions are taken to minimize dust, noise and water pollution. Regular tests on water and air quality and noise levels show results well in compliance with mandated standards.

D. PROJECT SUSTAINABILITY

xi. Production of coal can comfortably be maintained at the scaled-up level of 15 million tons per year in the Gevra mine. Sonepur-Bazari has adequate proven coal reserves and equipment of more than sufficient capacity to produce the target tonnage. In addition, because of the deregulation of higher grade steam coal, Sonepur-Bazari, which produces Grade C steam coal, is expected to realize a higher sale value than anticipated. The import of coking coal by SAIL was a one-time exercise to assist the steel industry. The sustainability of the project is rated as "likely."

E. BANK PERFORMANCE

xii. The performance of the Bank in respect of the project preparation and appraisal cannot be rated satisfactory. At appraisal, Bank management was not informed that land acquisition was a serious problem in West Bengal. The appraisal team did not look for an alternative mine design which could obviate the acquisition of heavily populated villages. The performance of the Bank in identification and

supervision is rated "satisfactory" because the project has proved to be sustainable and Bank missions were instrumental in the resolution of issues and completion of works.

F. BORROWER PERFORMANCE

xiii. The performance of the borrower and its implementing agencies was marginally satisfactory. A few problems occurred when the implementing companies were made responsible for the procurement of a coal handling plant and major workshop and training center buildings. The problems encountered in the acquisition of land at Sonapur-Bazari are likely, in part, to have been a result of the Bank's presence raising hopes of higher than normal compensation. ECL created a model village, whose success appears to have calmed the fears of project-affected people. Movement of project-affected people from the village of Ruidaspara has now been completed.

G. ASSESSMENT OF OUTCOME

xiv. Gevra's coal output has expanded from five million tons per year at loan signing, to 12 million as a consequence of the project. Gevra is now the highest producing and most profitable coal mine in India. Sonapur-Bazari has consistently been given low ratings by Bank supervision missions due to its land acquisition and resettlement difficulties. Hampered by these and in efforts to produce as much coal as possible, it exhausted its immediately available reserves. However, the worst of ECL's problems are resolved and production will reach the annual target tonnage by the end of 1997/98. The import of coking coal was satisfactory. Although there were delays in completion of the Sonapur-Bazari component, the outcome of the project is assessed as "satisfactory."

H. FUTURE OPERATION

xv. Operation of the project mines can now be confidently predicted to continue to be successful, albeit with a year delay on attainment of programmed output from Sonapur-Bazari. Tracer studies are being done for resettlement under all Bank financed projects in the coal sector in India under the Coal Sector Environmental and Social Mitigation Project (Cr. 2862-IN). Gevra is one of the mines slated to receive financing for equipment under the proposed Coal Sector Rehabilitation Project.

I. KEY LESSONS LEARNED

xvi. The main lesson learned concerns the difficulties of resettling project-affected people. Persuading project-affected people that they can benefit in a well-planned and mutually agreed resettlement scheme will make land acquisition far easier. The success of the 'model' Tapanpur resettlement village has yet to be fully proven, but present indications are that it represents a major step in the right direction.

xvii. The procurement of mining equipment is different from the procurement of major construction works required in this project. While Coal India competently handled the former operation, the SAR stated that the subsidiaries were to implement the far more complex latter operation. This proved to be extremely difficult for them and they were advised by Bank supervision missions to employ expert consultant advice. This expert design and supervision was critical to satisfactory completion of construction work and should be included in any future project.

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PART I: PROJECT IMPLEMENTATION ASSESSMENT

A. PROJECT OBJECTIVES

1. The main objectives of the project were:
 - (i) to improve the quality of coal available to consumers,
 - (ii) to increase the supply of thermal coal to the power and industrial sector, and
 - (iii) to increase the supply of coking coal to the steel sector.
2. Objective (i) was to be achieved in the thermal coal supply sector by the implementation of a series of efficiency improvement and institutional development measures such as the introduction of training programs, training institute design and state-of-the-art mining technology. Additionally, the project was designed to improve sector management via the implementation of a number of mining, handling and transportation measures contributing to the improvement of end-product quality.
3. Objective (ii) was to be achieved by procurement of equipment and the expansion of an existing opencast mine, at Gevra in the SECL coalfield, from five million tons to ten million tons production per year, and the development of a new opencast mine at Sonapur-Bazari in the ECL coalfield to produce 1.5 million tons per year by the original loan closing date (September 1994), rising to three million tons per year by FY 1996/97.
4. Objective (iii) was to be achieved by the import of about three million tons of high quality, coking-coal, to be blended with the high ash content indigenous coal, in order to improve blast-furnace efficiency and productivity in the steel industry, albeit on a short-term basis.

B. ACHIEVEMENT OF OBJECTIVES

5. Objective (i), designed to assist in improvement of coal quality, cannot be said to have been effectively achieved other than in consistency of product sizing, a not inconsiderable achievement in itself. This sizing, desirable for power plant supply, is brought about by the increased use of large-scale coal handling plants to crush, size, store and deliver processed coal into the transport system. While the provision of modern mobile mining equipment contributes to higher efficiency in opencast mining, it is the application of 'good-housekeeping' practices that makes the difference between clean coal, i.e. coal produced without the inclusion of extraneous non-coal matter, and dirty or adulterated coal. The latter will typically contain rock, shale, mud, etc. all of which not only reduce average calorific values but also cause damage to handling equipment at the power generating plant and increase ash disposal costs. In addition, the transportation of non-coal matter from the mine to the power plant is an unnecessary and wasteful cost burden on the rail transport system, the cost of which is borne by the power companies.

6. In general, the production of clean coal in Coal India's opencast mines is not regarded by the coal-producing companies as being as important as it should be. In part this has been due to a Government-mandated coal pricing structure which does nothing to encourage the production of cleaner coal and, in certain cases, can actually encourage adulteration to increase output tonnage without reducing the price per ton. Borrower/Bank discussions have resulted in many individual coal supply contracts being based now on a more realistic relationship between quality and price and a process of joint sampling with consumers. However, there have been many cases of unwillingness or inability of power generating companies to actually pay for the coal with which they have been supplied. It is hardly surprising, therefore, that the mining companies are reluctant to expend the extra care and cost necessary to produce cleaner coal.

7. Objective (ii) had mixed success. The expansion of production at SECL's Gevra mine in Madhya Pradesh has been highly successful. The mine supplies coal via a dedicated merry-go-round rail link to the 2100MW Super Thermal Power Station at Korba and to other power stations of similar capacity elsewhere. While Gevra can be said to be a relatively 'easy' mine, with a low overburden-to-coal ratio, level geology and thick coal seams, it is not without its practical difficulties. However, the expertise and enthusiasm of management, coupled with modern mining equipment partly supplied with Bank finance, resulted in achievement of the project target production of ten million tons per year two years ahead of program. Gevra is now the highest producing coal mine, in tonnage terms, in India and is likely to remain so for many years to come.

8. The ECL Sonapur-Bazari mine in West Bengal, in direct contrast to the foregoing, had serious implementation problems, primarily concerned with the acquisition and possession of land. Prior to Bank involvement the necessary land had not been acquired and it had been wrongly assumed that there would be no problems in that acquisition provided that Coal India's standard compensation arrangements were followed. At the beginning of 1995 the mine was at least four years behind program but the problems have been solved and all equipment has been commissioned. The present forecast is that the full mine output of three million tons per year will be achieved in FY1997/98, only one year behind the original schedule.

9. Objective (iii), designed to increase the supply of coking coal to the steel sector was achieved, as planned, in the initial few months of project implementation, by the import of some three million tons of high quality Australian coking coal to be blended with the high ash content indigenous coal, in order to improve blast-furnace efficiency and productivity in the steel industry, albeit on a short-term basis. This objective was achieved.

C. MAJOR FACTORS AFFECTING THE PROJECT

Gevra Mine

10. **Mine Development:** The expansion of SECL's Gevra project was implemented ahead of schedule, achieving ten million tons of annual production two years ahead of the plan. At the end of the scheduled period, production went up to 12 million tons. Since then annual output has increased again, to 15 million tons, without additional capital investment, by subcontracting the coal loading and transport, thus releasing SECL equipment for the removal of more overburden.

11. The 45 million tons of exposed coal reserve represents three years of production, whereas one year would be a sufficient strategic reserve. Thirty million tons of excess coal reserve represents a surplus advance overburden removal of around 30 million cubic meters and implies an unnecessary and continuing investment of at least US\$75 million. The initial mine design (preceding Bank

involvement) provided for horizon-mining, a system in which both overburden and coal are worked in horizontal slices. A large volume of coal was exposed far ahead of time, leading to spontaneous heating of coal and environmental pollution. Bank supervision missions consistently emphasized the hazards involved in the system, but it was 1994 before it was finally abandoned in favor of a more appropriate vertical benching system. However, it will take several more years to liquidate the large volume of coal exposed prior to 1994.

12. A large, well-equipped training center and a large central workshop complex with comprehensive facilities and equipment for mobile opencast mining equipment maintenance and repair have been constructed. These are being used as a SECL regional training center for opencast equipment operators and technicians.

13. **Resettlement and Rehabilitation Issues:** Initially, the Gevra project required the acquisition of 3500ha of land, upon which there were seven villages with 968 families that needed to be resettled. SECL created four nearby resettlement villages with infrastructure including panchayat bhawan, approach roads, internal roads, wells, tanks, drainage, village schools, health clinics, playgrounds, power supply, health centers and community centers. 923 families have been resettled, leaving 45 yet to be resettled as the mine progresses. Employment has been provided to 1,828 members of project-affected families and many re-training schemes have been implemented. Most of the resettlement was carried out prior to Bank involvement in this mine, which partly accounts for the relative lack of resettlement and rehabilitation problems. A recent NGO-implemented random survey shows that the project-affected people have attained an average increase of 130% in their incomes.

14. **Environmental Impact:** Dust is dealt with by mobile water trucks spraying the truck-haul road surfaces to slake dust generation. Areas about to be blasted are sprayed with water to minimize dust. Points within the coal handling plant where airborne dust is generated are sprayed with water to minimize dispersal. Stockpiles of coal are regularly sprayed with water. Noise pollution is minimized through the positioning of overburden dumps between the mine area and villages. In addition, exposed blasting ignition cord is covered with loose overburden to minimize noise. Blasting is not done at night or in low-cloud conditions. When water is evacuated from the mining area it is intercepted by silt and oil traps. In all these measures are taken in a conscientious manner by SECL and can be seen to be effective. Regular tests on water and air quality and noise levels show results well in compliance with mandated standards. However, the horizon mining method has prevented opportunities to place overburden below original ground level in areas where coal had been evacuated. This meant that there was far more overburden placed in dumps above original ground level than was necessary. The revised mining system has begun to release areas which have been exhausted of coal and SECL is placing overburden in these areas and will continue to do so.

Sonepur-Bazari Mine

15. **Mine Development:** The implementation of ECL's Sonepur-Bazari mine in West Bengal had serious implementation problems, primarily the acquisition and possession of land. From the beginning there was a perception among the local inhabitants, that the involvement of the World Bank increased the importance of the project. This led to a further perception that ECL could be forced into greater than normal levels of compensation, both in cash and lucrative employment with the company. It was perhaps unfortunate that the process took place in a period when the Bank was cautioning Coal India against overstaffing. This factor undoubtedly added to ECL's negotiating difficulties with project-affected people. At the beginning of 1995 the mine was at least four years behind program but since then all land has been acquired and all equipment has been commissioned.

The production in 1995/96 was 1.8 million tons. The present forecast is that the full mine output of three million tons per year will be achieved in FY1997/98, only one year behind plan.

16. A significant result of the delays has been that, in order to fulfill coal orders, the advance overburden excavation necessary to expose a strategic reserve of the coal seam has been overtaken, greatly reducing coal production flexibility. This overburden excavation and the mine geometry is being reestablished. Now that the land and resettlement and rehabilitation issues are dealt with, the project is expected to sustain production.

17. Mobile mining equipment was procured by Coal India and the training center and workshop was done by ECL with assistance and supervision of construction from external consultants. In August 1995, the Bank mission discovered that the coal dispatch system was substantially altered from the original design - a coal handling plant with a storage silo loading directly into railcars. In the new design, coal will be loaded into trucks which will transport the coal six kilometers to the rail siding where it will be restocked and loaded into railcars. The coal will be sold to the customer at the mine stockpile; the cost of loading, transporting, and re-loading will be borne by the customer. The Bank did not agree to this change because of its likely impact on the environment, and did not consider any further extension of the loan.

18. **Resettlement and Rehabilitation Issues:** Neither a baseline socio-economic survey nor a rehabilitation action plan was prepared before land acquisition. Implementation of this component was delayed by more than five years by a dispute between land owners and ECL. Even after prior written agreement on all points of compensation and resettlement detail based on the Gulla package in 1990/91 (see Annex D), land owners demanded jobs with ECL and ECL, which is overstaffed and making heavy losses, was only prepared to offer what was prescribed by the law. At the request of the Bank ECL prepared a socio-economic survey and a Rehabilitation Action Plan based on the Gulla package in 1994/95. Both have been reviewed by the Bank and found acceptable. ECL was finally able to resolve the stalemate after the Bank urged cancellation of this component and the West Bengal government intervened. In the end, ECL agreed to a fairly generous compensation package, which provided for jobs to land owners, as well as quite a few landless women, and cash allowances for crop losses and the relocation of households. The move to the resettlement village was completed in May of 1996.

19. Tracer studies are being carried out under the Coal Sector Environmental and Social Mitigation Project (ESMP) and action plans will be formulated and implemented under that project to raise the income level of any project-affected people from Sonepur-Bazari who are currently living under the poverty line. On the other hand it was evident that the mine design took little or no account of the practical difficulties that were likely to be encountered in the resettlement and rehabilitation of established communities. The mine design has since been modified in order to avoid both villages, thus eliminating the necessity for resettlement, except for one community.

20. **Environmental Impact:** As in the Gevra mine, precautions are taken to minimize dust, noise and water pollution. Regular tests on water and air quality and noise levels show results well in compliance with mandated standards. At the present time there is no excess advance excavation so there is no excess of overburden tipping above original ground level, nor should there ever be any occasion for such excess.

D. PROJECT SUSTAINABILITY

21. With the evident and proven coal reserves and SECL's many years of operational experience at the mine, there is no doubt that production of coal can comfortably be maintained at the scaled-up level of 15 million tons per year in the case of the Gevra mine. In addition, the relationship established between the company and existing project-affected people successfully resettled should go a long way towards giving confidence to the few project affected families yet to be resettled as necessary in the future.
22. Sonapur-Bazari has adequate proven coal reserves and equipment of more than sufficient capacity to produce the target tonnage. In addition, because of the deregulation of higher grade steam coal (A, B, C and D), Sonapur-Bazari, which produces Grade C steam coal, is expected to realize a significantly higher sale value than previously anticipated.
23. The import of a large quantity of coking coal by SAIL was a one-time exercise to temporarily assist the steel industry. There has been no suggestion by the Government that the exercise should be repeated. The steel industry currently imports about five million tons of coking coal a year.
24. Therefore, the sustainability of the project is rated as "likely."

E. BANK PERFORMANCE

25. The performance of the Bank in project preparation and appraisal cannot be qualified as satisfactory. At the time of appraisal, Bank management was not informed that the land acquisition was a serious problem in West Bengal and that political issues could adversely affect project implementation. The appraisal team was not aware that ECL was unable to launch many of their projects during the previous decade due to villagers' unreasonable demands, heightened by land acquisition problems caused by political rivalries. The appraisal team also did not look for an alternative mine design which could obviate the acquisition of heavily populated villages. For a long time, supervision missions faced hostile demonstrations from the villagers and could not freely move around the project site.
26. The Bank had very little to contribute to the procurement of coking coal for the steel plants. It was done by the Steel Authority of India who were already importing large volumes of coking coal from different parts of the globe.
27. Since SECL and ECL did not have any previous experience in designing major workshops and training centers, they accepted the Bank's advice to appoint local consultants to do so. It led to successful completion of these two components at both mine sites. Similarly, the borrower accepted the Bank's advice for employing local consultants for supervising the design and construction of coal handling plant at Sonapur-Bazari.
28. The appraisal team failed to assess that the main obstacle to the project implementation would be the acquisition of land at Sonapur-Bazari. At the time of appraisal, 520 acres of land required for the infrastructure and the first five years of mining operation were already legally acquired and taken into possession. Another 170 acres remained in the hands of the district officials awaiting final processing and hand over. Once it became known that Sonapur-Bazari was a World Bank financed project, all the adult population demanded company employment before they would agree to part with their land or homesteads. It also became a part of the fight between the two local political parties. Finally a revised mine design was worked out excluding the two village homesteads

from the project scope and thus obviating the major part of the problems. However, acquisition of a small hamlet of 16 landless families of scheduled castes and tribes at Ruidaspara, at the edge of Sonepur village could not be avoided. Despite a generous resettlement and rehabilitation package and construction of a model colony for them by the company, it was another two years before the State Government got the land vacated.

29. The performance of the Bank in respect to identification and supervision is rated as "satisfactory" because the project has proved to be a good and sustainable project and Bank missions were instrumental in the resolution of the issues and completion of the works.

F. BORROWER PERFORMANCE

30. The performance of the borrower and its implementing agencies, Coal India, SECL and ECL, was "marginally satisfactory." The experience gained by CIL in procurement in the two previous coal projects, Dudhichua Coal and Jharia Coking Coal, proved to be invaluable in the mining equipment procurement necessary in this project. A few problems did occur when the implementing companies, SECL and ECL, who had only limited previous experience with Bank financed procurement, were made responsible for the procurement of a coal handling plant and major workshop and training center buildings together with their internal equipment. With outside consultant assistance as provided for in the loan, however, both in design and supervision of construction, major workshops for the repair and maintenance of mobile mining equipment and well-equipped operator training centers have been established and are in use at both project mines.

31. The problems encountered in the acquisition of land at Sonepur-Bazari are likely, in part, to have been due to the involvement of the Bank, in that the Bank's presence appeared to engender hopes of higher than normal compensation which, had it been given, would have set a dangerous precedent for Coal India. Efforts to acquire the necessary land by ECL personnel were based on methods developed and prescribed by Coal India which had been successful elsewhere. ECL has now created a model village, adjacent to the project, the clearly apparent success of which appears to have calmed the understandable fears of project-affected people and generated a degree of trust in the company's integrity which was absent in the past. Movement of project-affected people from the village of Ruidaspara has now been completed. The resettlement village was developed close to the mine's employee colony and facilities.

G. ASSESSMENT OF OUTCOME

32. Gevra mine was successful even before the IBRD involvement. Its coal output has expanded from five million tons per year at loan signing, to 12 million as a consequence of the project, and is now continuing at 15 million tons per year. This has been partly achieved by subcontracting coal loading and transportation. Gevra is now, by a considerable margin, the highest producing coal mine in India and the most profitable.

33. Sonepur-Bazari has consistently been given low ratings by Bank supervision missions due to its land acquisition and resettlement difficulties. Hampered by these and in efforts to produce as much coal as possible it exhausted its immediately available reserves. However, the worst of ECL's problems are resolved and production will reach the annual target tonnage by the end of the next two years. The SAR predicted the achievement of a cumulative coal output of ten million tons by the close of FY 1995/96. The actual tonnage achieved was about half of that. The shortfall was brought about by the delays caused by years of land acquisition difficulties. The expected achievement of the

project's ultimate output of three million tons per year by FY 1997/98, only one year later than the SAR prediction, is therefore all the more creditable.

34. The estimates of project-affected families in the Staff Appraisal Report were 740 for Sonepur-Bazari and 1,370 for Gevra. The final numbers of families affected by the project are 98% and 30% lower, respectively: 16 families in Sonepur-Bazari and 968 families in Gevra. The number of project-affected families was drastically reduced in Sonepur-Bazari once the mine plan was redrawn to exclude the villages of Sonepur and Bazari, thus eliminating them from the project scope.

35. The import of coking coal was satisfactory. Although there were delays in completion of the Sonepur-Bazari component, the outcome of the project is assessed as "satisfactory."

H. FUTURE OPERATION

36. Operation of the project mines can now be confidently predicted to continue to be successful, albeit with a year delay on attainment of programmed output from Sonepur-Bazari. The latter could well be highly profitable because of the recently deregulation of pricing and distribution for high grade steam coal (Grades A, B, C and D).

37. Gevra, which produces mainly Grade F coal, will be positively affected by the recent Government decision to fully deregulate prices and distribution of the remaining regulated coal (Grades E, F and G) by January 1, 2000. Until then, Coal India is authorized to revise prices of the regulated coal every six months based on the normative costs developed by the Bureau of Industrial Cost and Prices.

38. Tracer studies are currently being done for resettlement under all Bank financed projects in the coal sector in India under the Coal Sector Environmental and Social Mitigation Project (Cr. 2862-IN), including Gevra and Sonepur-Bazari. Coal India will then develop and implement action programs to raise the incomes of any affected people who are living below the poverty line.

39. Gevra is one of the mines slated to receive financing for equipment under the proposed Coal Sector Rehabilitation Project.

I. KEY LESSONS LEARNED

40. The main lesson learned concerns the difficulties of resettling villagers owning and occupying land on a mine site. Persuading project-affected people that they can and will benefit financially and physically in a well-planned and mutually agreed resettlement scheme will make land acquisition far easier than it has been to date in Sonepur-Bazari. The success of the 'model' Tapanpur resettlement village has yet to be fully and permanently proven but present indications are that it represents a major step in the right direction. Parties external to the resettlement including local politicians, who had previously proved disruptive, were rigorously excluded from discussions and the ECL management approach to settle the issues with direct negotiation with project-affected people proved very effective. The houses provided were built by the project-affected people themselves with materials provided by ECL and constant hands-on assistance and advice from experienced ECL staff. Each house is well finished, with distinctive individual touches by its owners and is clearly a source of great personal pride in achievement to its owners. The village has been provided with all the amenities ECL feels are necessary and desirable (metalled access road, all-weather internal roads, permanent surface drainage, multiple wells and hand pumps, ponds, electricity supply to each house, street lighting, village school, medical room, panchayat bhawan and community center). The building

skills learned by the villagers are being put to profitable use in a community contracting scheme. ECL is employing them on a number of small scale building projects on the mines. They are also building their own temple within the village. ECL's 'demonstration' experiment appears to be a great success and a strong indication of an effective way forward.

41. The procurement of mining equipment is very different from the procurement of major construction works such as the two repair and maintenance workshops and internal equipment required in this project. While Coal India competently handled the former (relatively simple) operation, with staff previously trained in International Competitive Bidding (ICB) procurement, the SAR stated that the subsidiary companies (SECL and ECL) were to implement the far more complex latter operation. This proved to be extremely difficult for them and they were advised by Bank supervision missions to employ expert consultant advice, both on design and supervision of construction. This expert supervision was absolutely critical to the satisfactory completion of the construction work and should be included in any future project specifications.

IMPLEMENTATION COMPLETION REPORT

INDIA

COAL MINING AND COAL QUALITY IMPROVEMENT PROJECT

Loan 2796-IN

PART II: STATISTICAL TABLES

Table 1: Summary of Assessments

<u>A. Achievement of Objectives</u>	<u>Substantial</u>	<u>Partial</u>	<u>Negligible</u>	<u>Not applicable</u>
Macroeconomic policies	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sector policies	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Financial Objectives	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Institutional Development	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical Objectives	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poverty Reduction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Gender Concerns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other Social Objectives	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental Objectives	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public Sector Management	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private Sector Development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>B. Project Sustainability</u>	<u>Likely</u>	<u>Unlikely</u>	<u>Uncertain</u>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<u>C. Bank Performance</u>	<u>Highly Satisfactory</u>	<u>Satisfactory</u>	<u>Deficient</u>	
Identification	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Preparation assistance	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Appraisal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Supervision	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Table 1: Summary of Assessments (cont'd)

<u>D. Borrower Performance</u>	<u>Highly Satisfactory</u>	<u>Satisfactory</u>	<u>Marginally Satisfactory</u>	<u>Deficient</u>
Preparation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Covenant compliance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Operation (if applicable)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>E. Assessment of outcome</u>	<u>Highly satisfactory</u>	<u>Satisfactory</u>	<u>Unsatisfactory</u>	<u>Highly Unsatisfactory</u>
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Table 2: Related Bank Loans/Credits

<i>Loan/Credit</i>	<i>Purpose</i>	<i>Year of Approval</i>	<i>Status</i>
Preceding operations			
1. Dudhichua Coal Project (Ln. 2393-IN)	Application of modern opencast thermal-coal mining technology	1984	Closed on March 31, 1993. PCR prepared. Audited by OED.
2. Jharia Coking Coal Project (Ln. 2498-IN)	Extend application of modern opencast mining technology into the opencast coking-coal mining sector and to improve underground mining techniques	1985	Closed on December 31, 1992. PCR prepared.
Following Operations			
1. Jharia Mine Fire Control Project (Cr. 2450-IN)	Technical assistance to deal with the mine fires in the Jharia coalfield	1992	Under implementation
2. Coal Sector Environmental & Social Mitigation Project (Cr. 2862-IN)	Enhance Coal India's capacity to deal more effectively with environmental and social issues.	1996	Under implementation

Table 3: Project timetable

<i>Step in project cycle</i>	<i>Date planned</i>	<i>Date actual</i>
Identification	2/83	2/83
Preparation	2/83 - 1/85	2/83 - 6/85
Appraisal	2/85	6/85
Negotiations	5/1/86-5/12/86	5/1/86-5/12/86; 2/12/87-2/13/87
Board presentation	4/21/87	4/21/87
Signing	6/29/87	6/29/87
Effectiveness	9/28/87	9/28/87
Midterm review	na	na
Project completion	12/30/93	12/30/94
Loan closing	9/30/94	9/30/94

Table 4: Loan Disbursements: Cumulative Estimated and Actual
(US\$ millions)

	<i>FY88</i>	<i>FY89</i>	<i>FY90</i>	<i>FY91</i>	<i>FY92</i>	<i>FY93</i>	<i>FY94</i>	<i>FY95</i>	<i>FY96*</i>
Appraisal estimate	91.8	202.6	239.2	276.4	308.6	335.4	340.0	340.0	340.0
Actual	77.6	172.2	210.2	217.6	222.5	243.4	293.3	300.3	300.3
Actual as % of estimate	84.5%	85.0%	87.9%	78.7%	72.1%	72.6%	86.3	88.3%	88.3%
Final disbursement									March 31, 1996

* US\$39.7 million cancelled effective April 11, 1996.

Table 5: Key indicators for Project Implementation

	<i>Estimated</i>	<i>Actual</i>
I. Key implementation indicators in SAR	Not applicable, as the	
II. Modified indicators	project predates the standard	
III. Other indicators	requirement for key indicators	

Table 6: Key indicators for Project Operation

	<i>Estimated</i>	<i>Actual</i>
I. Key operating indicators in SAR	Not applicable, as the	
II. Modified indicators	project predates the standard requirement for key indicators	See Tables 6A & 6B below for production schedules.
III. Modified indicators for future operation		

Table 6A Production Schedule -Gevra

<i>Year</i>	<i>SAR forecast</i>		<i>Actual</i>	
	<i>Coal (Mt)</i>	<i>Overburden (Mm³)</i>	<i>Coal (Mt)</i>	<i>Overburden (Mm³)</i>
1981/82	0.05	0.27	0.05	0.27
1982/83	0.32	0.66	0.33	0.66
1983/84	1.44	1.76	1.44	1.76
1984/85	2.52	2.60	3.28	2.51
1985/86	2.73	3.50	4.31	2.50
1986/87	3.10	5.00	5.00	3.00
1987/88	4.25	6.50	6.50	3.01
1988/89	5.50	7.20	8.62	5.04
1989/90	7.20	8.50	9.70	6.64
1990/91	8.50	9.00	11.21	7.84
1991/92	10.00	9.00	13.20	9.67
1992/93	10.00	9.00	13.30	9.70
1993/94	10.00	9.00	14.05	10.63
1994/95	10.00	9.00	14.63	10.89
1995/96	10.00	9.00	15.44	12.90
1996/97	10.00	9.00	16.00	12.00
1997/98	10.00	9.00	16.00*	12.00*
1998/99	10.00	9.00	16.00*	12.00*

Note: Project capacity of 10 Mtpy was increased by the Gevra Augmentation Project of 2 Mtpy sanctioned in July 1992. The present capacity of the Project is 12 Mtpy.

*Forecast

Table 6B Production Schedule - Sonepur-Bazari

Year	SAR forecast		Actual	
	Coal (Mt)	Overburden (Mm ³)	Coal (Mt)	Overburden (Mm ³)
1986/87				
1987/88				
1988/89		3.00		2.40
1989/90	0.40	4.02	0.26	1.91
1990/91	1.10	4.02	0.50	1.50
1991/92	1.50	6.27	0.51	1.80
1992/93	1.50	6.27	0.38	2.01
1993/94	1.50	6.27	0.45	2.28
1994/95	1.50	8.04	1.26	4.93
1995/96	2.50	13.73	1.85	6.13
1996/97	3.00	16.39	1.75	6.20
1997/98	3.00	16.39	3.00	11.30*
1998/99	3.00	16.39	3.00*	13.80*

Note: Delay in achieving target production is due to delay in: i) land acquisition, ii) rehabilitation and resettlement work, iii) diversion of Suri road and iv) initial restriction in blasting for dragline operation due to proximity of villages to working area.

*Forecast

Table 7: Studies included in the project

<i>Study</i>	<i>Purpose defined at appraisal</i>	<i>Status</i>	<i>Impact</i>
--------------	-------------------------------------	---------------	---------------

There were no studies included in the project.

Table 8A: Project costs
(US\$ million)

<i>Item</i>	<i>Appraisal estimate (figures from SAR)</i>			<i>Actual</i>		
	<i>Local</i>	<i>Foreign</i>	<i>Total</i>	<i>Local</i>	<i>Foreign</i>	<i>Total</i>
Mining Equipment & Spares	76.1	101.8	177.9	122.6	80.8	203.4
Coal Handling Plant	34.8	3.7	38.5	16.9	0.0	16.9
Land & Civil Works	45.8	0.0	45.8	19.4	0.0	19.4
Workshop - Civil Works	17.6	0.0	17.6	14.3	0.0	14.3
Workshop - Equipment	3.2	9.8	13.0	5.2	0.6	5.7
Engineering	1.7	0.0	1.7	0.6	0.0	0.6
Pre-operating Expenditure	10.1	0.9	11.0	9.8	0.0	9.8
Technical Assistance	0.0	3.0	3.0	0.0	0.7	0.7
Training Equipment	3.3	1.3	4.6	0.1	0.0	0.1
Import of coking coal	0.0	160.0	160.0	0.0	160.0	160.0
Duties & Taxes	65.6	0.0	65.6	0.0	0.0	0.0 ^{d/}
Base Cost	258.1	280.5	538.6	188.9	242.1	431.0
Physical Contingencies	14.4	6.4	20.7	-	-	-
Price Escalation	36.9	26.6	63.4	-	-	-
Installed Cost	309.3	313.5	622.8^{a/}	188.9	242.1	431.0
Working Capital	14.0	0.7	14.7	11.7	0.0	11.7
Project Cost	323.3	314.2	637.5	200.6	242.1	442.7
Interest during construction	1.4	4.3	5.7	0.0	0.0	0.0 ^{d/}
	324.7	158.6	643.2^{b/}	200.6	242.1	442.7^{e/}

^{a/} Includes US\$34.7 million indirect foreign exchange.

^{b/} Total cost was subsequently reduced by US\$ 17.5 million by reducing/modifying category-wise loan components for both sub-projects.

^{c/} Mining equipment and spare parts cost is inclusive of Duties and Taxes.

^{d/} Interest during construction is included in pre-operating Expenditure

^{e/} In US\$ terms the actual cost is much lower than that projected in the SAR because of sharp depreciation of the valuation of the Indian Rupee. Additional investment is required to complete the Sonepur-Bazari portion of the project.

Table 8B: Project Financing
(US\$ million)

Source	Appraisal estimate			Actual		
	Local	Foreign	Total	Local	Foreign	Total
IBRD	21.5	318.5	340.0	58.2	242.1	300.3
Coal India/GOI	303.2	0.0	303.2	142.4	0.0	142.4
Total	324.7	318.5	643.2	200.6	242.1	442.7

Table 9A: Economic Cost/Benefit Streams - Gevra mine
Rs million in 94/95 terms

Fiscal year	Production Mt	Capital costs	Operating costs	Working capital	Net revenues	Net flow
1981/82	0.1	60.9				-60.9
1982/83	0.3	49.2				-49.2
1983/84	1.4	127.9	75.7	25.2	474.8	246.0
1984/85	3.3	447.7	198.1	40.8	1084.4	397.8
1985/86	4.3	446.5	344.6	48.8	1424.4	584.5
1986/87	5.0	289.3	458.8	38.1	1652.4	866.2
1987/88	6.5	431.5	662.9	68.1	2147.8	985.3
1988/89	8.6	736.7	809.7	48.9	2848.4	1253.1
1989/90	9.7	453.1	799.6	-3.4	3205.0	1955.6
1990/91	11.2	494.7	768.5	-10.4	3704.5	2451.7
1991/92	13.2	459.7	1091.6	107.7	4361.4	2702.5
1992/93	13.3	104.9	943.0	-49.5	4395.1	3396.7
1993/94	14.0	457.6	1090.4	49.1	4640.6	3043.5
1994/95	14.6	269.8	1155.2	21.6	4833.5	3387.0
1995/96	14.6	47.0	1244.0	29.6	4814.0	3493.4
1996/97	14.0	63.4	1251.2	2.4	4625.7	3308.8
1997/98	12.0	44.3	1158.4	-30.9	3964.9	2793.1
1998/99	12.0	79.8	1158.4		3964.9	2726.7
1999/00	12.0	29.9	1158.4		3964.9	2776.6
2000/01	12.0	109.8	1158.4		3964.9	2696.7
2001/02	12.0	88.6	1158.4		3964.9	2717.9
2002/03	12.0	104.0	1158.4		3964.9	2702.5
2003/04	12.0	84.0	1158.4		3964.9	2722.5
2004/05	12.0	84.0	1158.4		3964.9	2722.5
2005/06	12.0	84.0	1158.4		3964.9	2722.5
2006/07	12.0	84.0	1158.4		3964.9	2722.5
2007/08	12.0	84.0	1158.4		3964.9	2722.5
2008/09	12.0	84.0	1158.4		3964.9	2722.5
2009/10	12.0	84.0	1158.4		3964.9	2722.5
2010/11	12.0	-1084.0	1158.4	-386.1	3964.9	4276.6
					Economic IRR	166.2%

Table 9B: Economic Cost/Benefit Streams - Sonepur Bazari mine
Rs million in 94/95 terms

<i>Fiscal year</i>	<i>Production Mt</i>	<i>Capital costs</i>	<i>Operating costs</i>	<i>Working capital</i>	<i>Net revenues</i>	<i>Net flow</i>
1986/87	0.6	686.9	97.5	32.5	482.8	-334.1
1987/88	0.6	80.2	84.9	-4.2	502.9	342.0
1988/89	0.7	28.3	86.1	0.4	523.0	408.2
1989/90	0.3	42.3	90.6	1.5	209.2	74.9
1990/91	0.5	64.1	92.2	0.6	403.1	246.2
1991/92	0.5	-27.9	107.1	4.9	410.4	326.2
1992/93	0.4	525.7	119.8	4.2	306.6	-343.1
1993/94	0.5	1387.1	169.6	16.6	362.1	-1211.3
1994/95	1.3	1167.6	199.2	9.9	1014.6	-362.1
1995/96	1.8	808.6	310.4	37.1	1448.3	292.3
1996/97	2.0	304.5	371.2	20.3	1609.3	913.3
1997/98	2.4	129.1	419.8	16.2	1931.1	1365.9
1998/99	3.0	112.0	492.8	24.3	2413.9	1784.8
1999/00	3.0	24.0	492.8	0.0	2413.9	1897.1
2000/01	3.0	21.3	492.8		2413.9	1899.8
2001/02	3.0	32.6	492.8		2413.9	1888.5
2002/03	3.0	365.9	492.8		2413.9	1555.2
2003/04	3.0	235.0	492.8		2413.9	1686.1
2004/05	3.0	336.4	492.8		2413.9	1584.7
2005/06	3.0	704.4	492.8		2413.9	1216.7
2006/07	3.0	322.8	492.8		2413.9	1598.3
2007/08	3.0	0.0	492.8		2413.9	1921.1
2008/09	3.0	4.5	492.8		2413.9	1916.6
2009/10	3.0	1.1	492.8		2413.9	1920.0
2010/11	3.0	22.6	492.8		2413.9	1898.5
2011/12	3.0	561.0	492.8		2413.9	1360.1
2012/13	3.0	714.8	492.8		2413.9	1206.3
2013/14	3.0	101.4	492.8		2413.9	1819.7
2014/15	3.0	-1835.9	492.8	-164.3	2413.9	3921.3
					Economic IRR	84.1%

Assumptions for economic analysis

Gevra

The Financial Cost streams have been converted into Economic Cost Streams by the following factors:

Capital (imported)	1.00
Capital (indigenous)	0.80
Composite Capital to 94/95	0.87
Operating expenses	0.80

The SAR did not consider the Border Price, instead the Long Run Marginal Cost is used. This is projected domestic price paid at pithead', i.e. price plus levies and taxes.

Grade F coal price/ton in Rs	264.20
Royalty/ton in Rs	50.00
Stowing Excise Duty Rs	3.50
Sales Tax/ton in Rs	12.71
Total price/ton in Rs	330.41

Sonepur-Bazari

The Financial Cost streams have been converted into Economic Cost Streams by the following factors:

Capital(imported)	1.00
Capital(indigenous)	0.80
CompositeCapitalto94/95	0.85
Operatingexpenses	0.80

The SAR did not consider the Border Price, instead the Long Run Marginal Cost is used. This is projected domestic price paid at pithead', i.e. price plus levies and taxes.

Grade C LongFlame coal price/ton in Rs	545.20
Royalty/ton in Rs	5.50
Cesses/ton in Rs	219.48
Stowing Excise Duty Rs	3.50
Sales Tax/ton in Rs	30.95
Total price/ton in Rs	804.63

Analysis of Results of economic analysis

In the SAR the Economic IRR for Gevra is 32% and the Economic IRR for Sonepur-Bazari is 19.3%. A comparison of the actual economic rates of return with the projections at appraisal shows a significant improvement on the rates for both projects - Gevra and Sonepur-Bazari.

In the case of Gevra, the significant improvement of the actual rates of return over the projections is largely the result of the fact that (a) the project was completed considerably earlier than expected; (b) production during recent years exceeded projected levels by 100%; (c) the judicious use of project savings made it possible to expand the mine capacity by an additional two million tons per year; (d) operating costs per ton were considerably lower than projected because of the extensive use of contractors; and (e) the increase in the sale price of coal exceeded projections at appraisal.

In the case of Sonepur-Bazari, the main reasons for the higher rates of return are (a) a change in the quality of coal and (b) higher-than-projected prices for the coal. At the time of appraisal, the Sonepur-Bazari mine was expected to produce grade C and D 'long flame' coal. After the mine began production, the grade was revised to 'B and C - long flame' coal. Deregulation of the prices of coal grades A through D has, in addition, led to a substantially higher rise in coal prices than was projected at the time of appraisal. While the rates of return for Sonepur-Bazari exceed the projections at the time of appraisal, they are not nearly as high as those for Gevra.

Table 10: Legal covenants

<i>Agreement</i>	<i>Section</i>	<i>Covenant Type</i>	<i>Original Fulfillment Date</i>	<i>Revised Fulfillment Date</i>	<i>Description of Covenants</i>	<i>Status</i>														
LA	2.20(b)	Financial			GOI to maintain special account in Dollars.	Complied														
LA	3.02(b)	Financial			GOI to relend to CIL under terms acceptable to IBRD (not less than 13.75%, repayment in 15 years, including 5 years grace period)	Complied														
LA	4.01	Accounts	12/31/91		Borrower to submit audited accounts relating to import of coking coal (due within 9 months of end of FY).	FY 90/91 received. No longer applicable since program for coking coal import has been completed.														
LA	4.02(a)	Accounts	12/31/93	03/21/94	CIL/ECL/SECL to submit SOE audit report, due within 9 months of FY end.	Complied.														
LA	4.02(b)	Accounts	12/31/94		GoI to submit audit report of the Special Accounts to the Bank within 9 months of FY end.	Complied.														
LA	4.03	Financial	01/01/01		GoI to periodically review coal prices to ensure CIL financial viability and progressive mobility of financial resources to cover an increasing part of coal sector capital expenditures.	Average Price increased as follows: <table border="1"> <thead> <tr> <th><u>On (date)</u></th> <th><u>to Rs/ton</u></th> </tr> </thead> <tbody> <tr> <td>12/3/87</td> <td>219</td> </tr> <tr> <td>01/01/89</td> <td>249</td> </tr> <tr> <td>12/28/91</td> <td>322</td> </tr> <tr> <td>02/17/93</td> <td>363</td> </tr> <tr> <td>06/18/93</td> <td>381</td> </tr> <tr> <td>06/17/94</td> <td>401</td> </tr> </tbody> </table>	<u>On (date)</u>	<u>to Rs/ton</u>	12/3/87	219	01/01/89	249	12/28/91	322	02/17/93	363	06/18/93	381	06/17/94	401
<u>On (date)</u>	<u>to Rs/ton</u>																			
12/3/87	219																			
01/01/89	249																			
12/28/91	322																			
02/17/93	363																			
06/18/93	381																			
06/17/94	401																			

<i>Agreement</i>	<i>Section</i>	<i>Covenant Type</i>	<i>Original Fulfillment Date</i>	<i>Revised Fulfillment Date</i>	<i>Description of Covenants</i>	<i>Status</i>
LA	4.04	Sector	03/31/88		GoI to provide the Bank, by March 31, 1988, with a time-bound programme for the implementation of the Fazal Committee recommendations on coal supplies to power stations.	Complied.
LA	4.05	Financial	10/01/88		GoI to provide the Bank, by 10/01/88, with additional program of measures to allow CIL to comply with financial targets noted in PA Section 4.03.	Complied.
PA	2.07	Studies	12/31/89	06/30/94	CIL to provide the Bank, by 12/21/89, with a report of detailed mine planning and slope stability of mining under the project.	Complied.
PA	2.08	Environ.	01/01/01		CIL, ECL and SECL to ensure that design, construction and operation of the projects are carried out with due regard to ecological, environmental and safety standards satisfactory to the Bank.	Complied.
PA	2.09	Resettle	01/01/01		CIL/ECL/SECL: Implementation of resettlement Programs.	Complied.
PA	3.03	Financial	01/01/01		CIL, ECL and SECL to take out insurance against risks in such amounts as will be consistent with appropriate practice.	Complied.
PA	3.06	Monitor	01/01/01		ECL and SECL to establish and maintain Project Management Units.	Complied.

<i>Agreement</i>	<i>Section</i>	<i>Covenant Type</i>	<i>Original Fulfillment Date</i>	<i>Revised Fulfillment Date</i>	<i>Description of Covenants</i>	<i>Status</i>
PA	3.07	Studies	01/01/01		ECL, from 12/31/87, to provide the Bank with annual progress reports on the results of its program to rehabilitate twenty loss-making mines, and extend the program to an additional twenty loss-making mines.	No longer required.
PA	3.08	Financial	01/01/01		CIL to review annually with the Bank its performance with regard to achieving the agreed-upon financial targets.	Complied.
PA	4.02	Account	12/31/94		CIL/ECL/SECL to submit audited financial statements within 9 months of FY end.	Complied.
PA	4.03	Financial	12/31/94		CIL to ensure consolidated internal cash generation is at least 1.3 times debt service requirements.	Complied.
PA		Financial			CIL/subsidiaries not to incur debt if debt/equity ratio exceeds 60/40.	Complied.
PA		Financial			CIL/subsidiaries to maintain a ratio of current assets/liabilities of not less than 1.2.	Complied. From FY 91/92 it is below 1.2.
PA	Sch. II(a)	Monitor	12/31/88		ECL and SECL to employ consultants for establishing training institutes.	Complied.
PA	Sch. II(b)	Monitor	12/31/88		ECL and SECL to employ consultants for the design of regional and central workshops.	Complied.
PA	Sch. II(c)	Monitor	12/31/88		ECL and SECL to employ consultants for organization of training and design and implementation of manpower inventory system.	Complied.

Table 11: Compliance with Operational Manual Statements

The ICR did not identify any deviation of substance from the relevant Operational Manual Statements.

Table 12: Bank Resources - Staff Inputs

<i>Stage of project cycle</i>	<i>Planned¹</i>		<i>Revised¹</i>		<i>Actual</i>	
	<i>Weeks</i>	<i>US\$</i>	<i>Weeks</i>	<i>US\$</i>	<i>Weeks</i>	<i>US\$</i>
Through Appraisal					123.1	264.0
Appraisal to effectiveness					53.2	137.8
Supervision					179.9	478.4
Completion					25.0	50.2
Total					381.2	930.4

¹ The planned and revised staff inputs are not available.

Table 13: Bank Resources - Missions

<i>Stage of project cycle</i>	<i>Month/ year</i>	<i>No. of people</i>	<i>Days in field</i>	<i>Skills represented¹</i>	<i>Performance rating</i>		<i>Types of problems</i>
					<i>Implem. status</i>	<i>Develop. impact</i>	
Through appraisal	2/83	6	14	EN, EC, PR, FA,	-	-	-
Appraisal to Board	6/85	6	24	EN, EC, PR, FA	-	-	-
Board to effectiveness	4/87	4	14	EN, EC, PR, FA	-	-	-
Supervision	6/87	4	14	EN, FA, PR	1	1	-
	1/89	1	14	EN	3	3	land acquis.
	8/90	3	19	EC, EN	2	2	land acquis.
	1/91	3	16	EC, EN	2	2	
	9/91	4	18	OA, EN, EC	3	2	land acquis.
	6/92	4	19	EC, OA, EN	3	2	land acquis.
	3/93	3	17	OA, EN	2	2	
	1/94	3	25	OA, EC, EN	2	2	
	6/95	3	34	OA, EC, EN	S	S	
Completion	2/96	1	13	EN	S	S	

¹ EN - Engineer; EC - Economist; FA - Financial Analyst; PR - Procurement Specialist; OA - Operations Analyst

ANNEX A: AIDE MEMOIRE OF THE ICR MISSION

1. A mission consisting only of Mr. D. Bateman, Mining Consultant, visited India between February 21 and March 6, 1996 for the purpose of collecting data and information necessary for the production of the Implementation Completion Report for the above project. This aide memoire summarizes the results of the mission and the associated discussions.
2. Mr. Bateman thanks the Chairman and staff of Coal India Ltd., South Eastern Coalfields Ltd. (SECL) and Eastern Coalfields Ltd. (ECL) for assistance, cooperation and hospitality during the mission.

Gevra Opencast Mine

3. All information requested by the mission was supplied in written form. It was noted that the augmented tonnage of 12 million tons of coal per year had, in fact, been considerably exceeded, reaching 15 million tons, and that the larger tonnage would be produced annually from now on. The in-pit inventory of exposed coal presently stands at about 45 million tons, three years supply at the current production level. There appears to be no reason why that level cannot be continued to project exhaustion.
4. Resettlement and rehabilitation continues to progress satisfactorily and it appears extremely unlikely that the project will suffer any hindrance to its mining operations in the future from that particular aspect of operations.

Sonepur Bazari Opencast Mine

5. A written report containing most of the information required was supplied to the mission and remaining information was elicited during discussions. The mine shows clear evidence of the delays caused by difficulties of resettlement. At the present time land acquisition delays have restricted working room to such an extent that there is a negligible exposed coal inventory of only a few thousand tons. In addition, the mining equipment, even with the addition of the dragline which is unlikely to become a full-time producer before July 1996, is likely to take several months to exceed immediate overburden requirements sufficiently to create a reserve of, say, four months supply (one million tons). As a consequence of the delays already experienced, the original Kumarkhela mine equipment, which had been scheduled to produce about 600,000 tons of coal per year, is rapidly approaching the time at which it will have to be retired and can no longer be fully relied upon. However, the mine management convinced the mission that the revised production program of 1.8 million tons (Mt) in 1995/96, 2.4 MT in 1996/97, 3.0 Mt in 1997/98 and 3.0 Mt per year thereafter was achievable—provided that the presently evident acceleration of resettlement was maintained.
6. Resettlement and rehabilitation: ECL has convinced the affected peoples that they will benefit materially from the measures and compensation which has been agreed upon. The inhabitants of Ruidaspara, a village which was hampering the opening-up of the mine, have moved to their already completed resettlement village at the periphery of the mine. The inhabitants of the larger village of Punjabidanga have agreed to move to a resettlement some considerable distance away at Asansol which, being adjacent to the Calcutta-Delhi Grand Trunk road, is a more desirable location for a people whose source of income is related to road transportation and its associated truck repair and maintenance. ECL has recently successfully completed the resettlement of the people of Kotadi, affected by another mining project, to the new village of Tapanpur at the eastern edge of Sonepur Bazari, in the process creating a 'demonstration' project which is attracting a great deal of local interest and positive comment, thus being effective in dispelling the understandable fears of any of those affected by the Sonepur Bazari resettlement plans.

ANNEX B: BORROWER'S EVALUATION REPORT

Assessment of objectives, implementation and operation experience

1. The objective of improving the quality of coal supply to the consumer has been achieved at Gevra with the use of a large scale coal handling plant installed at the project. The project is supplying better quality coal to the power houses and is earning bonuses from its consumer NTPC. Similarly, at Sonepur-Bazari a coal handling plant has been installed and with its use, the project will be able to supply better quality thermal coal to its consumers.
2. The objective of increasing the supply of thermal coal at Gevra has been a great success. With better management, the production of coal from the project has always been ahead of schedule. This resulted in the achievement of the target production (10 million tons per year) in 1989-90, two years ahead of schedule. SECL could successfully implement an augmentation plan of 2.0 million tons of coal per year out of the savings from the loan amount, with the approval of the Bank. Actual production performance is around 15 million tons of coal per year.
3. The Sonepur-Bazari project of ECL was to achieve a target production of 1.5 million tons of coal per year by the loan closing date (1994-95), rising to 3 million tons per year by 1996-97. From the beginning the project had serious implementation problems, mainly with the acquisition and possession of land. With continued efforts, sufficient land for ten years of operation has been acquired by ECL. Further, with the persistent efforts and negotiations made at different levels, ECL has been successful in resettling all the villagers of a small hamlet (Ruidaspara), which was so long restricting the mining operation of the project. The project achieved coal production of 1.26 million tons during 1994-95 and 1.854 million tons during 1995-96. From the present trend, ECL management hopes to achieve the target coal production by 1997-98.

Evaluation of Borrower's performance

4. With the continued effort from all concerned, the project was implemented in a professional manner. The experience gained by Coal India in procurement in the two previous World Bank aided coal projects (Dudhichua and Jharia Coking Coal Projects) helped enormously in procuring the mining equipment necessary in this project.
5. Coal India, ECL and SECL have gained valuable experience in planning and implementing large scale highly mechanized opencast projects. Various studies were also conducted in the field of operation, slope stability of dumps and other operational practices to improve productivity. These studies were very helpful to the project authorities.
6. In Gevra, due to planned and efficient implementation, the target was met ahead of schedule and exceeded. Similar good practice should be strictly adhered to during implementation of all future projects.
7. The problems faced in the resettlement of villagers at Sonepur-Bazari appears to be a major lesson learned by ECL management. However, ECL was finally successful in resettling the villagers of Ruidaspara in May 1996. All 64 families of Ruidaspara have been shifted to the new resettled site and the vacated land is now under possession of the ECL project authority. The Borrower has learned that in certain cases, advanced action for acquisition/possession of land is required to make the project a success. This has been practiced recently in the case of Kottadih project (adjacent to Sonepur-Bazari)

where a model resettlement village named Tapanpur has been completed by ECL. Over 100 oustee families from the village of Kottadih have been resettled there and the project has been highly successful.

8. The assistance of the experts as consultants and supervision during the major construction work has also helped in timely and satisfactory completion of the project.

Bank's contribution

9. Highly professional supervision missions from the Bank have made the project completion a success. The assistance of the World Bank to Coal India in developing largescale highly mechanized opencast coal mines and improving the efficiency through better training of the personnel in state of the art technology and mine planning techniques, along with better utilization of equipment is highly appreciated. The assistance of the Bank for inclusion of major construction activities such as the coal handling plant, workshop and training center as an integral part of the project is also highly appreciated. The Bank's assistance in rehabilitation and resettlement was helpful in drawing out the new Resettlement and Rehabilitation Policy of Coal India.

ANNEX C: DETAILS OF MAJOR FACTORS AFFECTING THE PROJECT

Gevra

1. The expansion of SECL's Gevra project was implemented ahead of schedule, achieving the designed ten million ton annual production one year ahead of the schedule. A US\$12 million 'Gevra Augmentation Project', designed to increase production by two million tons per year, was sanctioned in response to increased local demand. Since that time annual output has been increased yet again, to 15 million tons, without additional capital investment. Output potential was boosted by the sub-contracting of the coal loading and on-site transport to crushers, thus releasing SECL equipment to supplement the mine's overburden stripping capacity. Gevra currently holds Indian national records for highest annual, monthly and daily coal dispatches. The present existence of an exposed coal inventory of around 45 million tons and the release of SECL's loading and transportation equipment, consequent upon the above-mentioned sub-contract, makes it now possible to produce 15 million tons per year for the foreseeable future. However, 45 million tons of exposed coal reserve represents three years of production, whereas one year (15Mt) would be a sufficient strategic reserve. Thirty million tons of excess coal reserve represents a surplus advance overburden removal of around 30 million cubic meters and implies an unnecessary and continuing investment of at least US\$75 million. This situation came about through an initial mine design decision (preceding Bank involvement) to operate the mine on the basis of horizon-mining, a system in which both overburden and coal are worked in horizontal 'slices'. Bank supervision missions consistently emphasized the inappropriate nature of the system to SECL but it was 1994 before it was finally abandoned in favor of a more appropriate vertical benching system. By that time, however, the excess advance excavation had been established and continues to the present day.

2. A large, well-equipped training center with housing accommodation for trainee-operatives and a large central workshop complex with fully comprehensive facilities and equipment for mobile opencast mining equipment maintenance and repair have been constructed and are now fully operational. Both were designed by consultants, as required by the Agreements, and the workshop construction was also supervised by the same consultants.

Gevra Resettlement and Rehabilitation

3. Initially, the Gevra project required the acquisition of 3500ha of land, of which 2945ha is now under possession, upon which there were 11 villages, seven of which, involving 968 families, needed to be resettled. SECL created four nearby resettlement villages (Vijay Nagar, Nehru Nagar, Ganga Nagar and Laxman Nagar) all complete with infrastructure including a panchayat bhawan, approach roads, internal roads, wells, tanks, drainage, individual village schools, children's playgrounds, power supply, health centers and community centers. Out of 968 families which were affected 923 have been resettled, leaving 45 yet to be resettled as the mine progresses. Employment has been provided to 1,828 members of project-affected families and many re-training schemes have been implemented. Most of the resettlement was carried out prior to Bank involvement in this mine, which is likely, in part, to account for the relative lack of problems. A recent NGO-implemented random survey of 15 project-affected people (PAPs) shows an average increase in income of over 130%, i.e. earnings are now 2.3 times as high as previous earnings. The Gevra Area, consisting of Gevra mine and its smaller adjacent Dipka mine, has given direct employment to over 4000 persons and indirect employment to 2200 and has established five family planning centers and centers for rehabilitation, medical examination, diagnosis, immunization, eye health, dentistry and leprosy treatment.

Gevra Environment

4. Environmentally the picture is mixed. On the positive side, dust which would be made airborne due to the trafficking of dumptrucks is dealt with by the use of mobile water-spray trucks constantly patrolling and spraying the truck-haul road surfaces to slake the inevitable dust generation. Areas about

to be blasted are first sprayed with water to minimize dust emission. Points within the coal handling plant where airborne dust is generated are sprayed continuously with water to minimize dispersal. Stockpiles of coal are regularly sprayed with water. Water is in plentiful supply: on-site sumps having a combined capacity of 80,000m³ (over 20 million US gallons) which have been created for settlement of solids and storage purposes within the mined area. Noise pollution is minimized through the interpositioning of overburden dumps between the mine area and villages and the attenuation due to distance ensures acceptable noise levels at the mine perimeter. In addition, exposed blasting ignition cord is covered with loose overburden to minimize noise. Blasting itself is not done at night or in low-cloud conditions. Millisecond-delay detonators and proper hole-stemming procedures are in routine use and over-charging of holes with explosives is not permitted. When water is evacuated from the mining area it is intercepted by silt and oil traps. Sewage is dealt with by a purpose-built integrated system with an oxidation pond. These measures are taken in a conscientious manner by SECL and are effective. Regular tests on water and air quality and noise levels show results well in compliance with mandated standards.

5. On the environmental downside the originally planned horizon mining method, which resulted in excessive advance excavation, has prevented opportunities to place overburden below original ground level in areas where coal had been fully evacuated. This means that there has been far more overburden placed in dumps above original ground level than was necessary. Coal India's mining subsidiaries are not obliged by Indian mining regulations to replace overburden in mined-out areas after mine completion. In consequence such dumps will remain in perpetuity, camouflaged only by tree planting. The revised mining system has begun to release areas which have been exhausted of coal and SECL are placing overburden in these areas, below original ground level, and will continue to do so from now on.

Sonepur Bazari

6. The implementation of ECL's Sonepur-Bazari mine in West Bengal, in direct contrast to SECL's Gevra mine, had serious implementation problems, primarily concerned with the acquisition and possession of land. From the beginning there was a perception by the occupiers of the land required for mining, reportedly fostered by external politically-motivated agencies, that the involvement of the World Bank increased the importance of the project. This put additional pressure on ECL during the implementation of the project. This led to a further perception that ECL could thereby be forced into greater than normal levels of compensation, both in cash and lucrative employment with the company. It was perhaps unfortunate that the process took place in a period when the Bank was cautioning Coal India against overstaffing. This factor undoubtedly added to ECL's negotiating difficulties with project-affected people. At the beginning of 1996 the mine was at least four years behind program but there now are clear signs that the problems have been or are in process of being solved and the present forecast is that the full mine output of 3 million tons per year will be achieved in FY 1998/99, only two years behind program. A part of the production to date has come from the small opencast Kumarkhela mine which has been in operation within the project area for the past few years. The mine exploited only the uppermost R-VI coal seam whereas the project will exploit, in addition to R-VI, the two lower seams, R-V and R-IV. The equipment from the Kumarkhela mine is now rapidly approaching the end of its useful life and will not add materially to the project's production capacity in future. ECL is taking appropriate measures for the replacement of this equipment.

7. A significant result of the delays has been the disruption of progression of the mine design in that, in order to fulfill coal orders, the advance overburden excavation which is necessary to expose a 'strategic' reserve of the coal seam has been overtaken thus greatly reducing coal production flexibility. This overburden excavation, or so-called 'work-in-progress', will have to be re-established once resettlement is completed and it is possible that coal production may temporarily suffer while that operation is being carried out if breakdowns to major equipment units occur.

8. Mobile mining equipment was procured by CIL and the training center, coal handling plant (CHP) and workshop, together with its machine tools, etc., was done by ECL with assistance and

supervision of construction from external consultants. The coal dispatch system has been altered from the original design which involved a CHP with a coal storage silo loading directly into railcars on a rail-siding on-site. The rail loading point will now be situated on the south side of the Suri Road and coal will be loaded by rubber-tired front-end loaders into on-site trucks which will transport the coal some six kilometers (ca 4 miles) to the rail siding where it will be re-stocked and re-loaded into railcars, again by rubber-tired front-end loaders. The coal will be sold to the customer at the mine stockpile; in consequence, the cost of loading, transporting, re-stockpiling and re-loading into railcars will be borne by the customer. The only cost to accrue directly to ECL will be that involved in the provision and maintenance of a metalled road from the CHP to the rail loading point. This will parallel the proposed Suri Road diversion which is required before any further mine development can be implemented. The transportation will be sub-contracted and will, at the full 3 million tons per year production, involve an average traffic intensity of about one 12t truck every fifty seconds in each direction on the dedicated road.

Sonepur Bazari Resettlement and Rehabilitation

9. Neither a baseline socio-economic survey nor a rehabilitation action plan was prepared before land acquisition. Implementation of this component was delayed by more than five years by a dispute between land owners and ECL. Even after prior written agreement on all points of compensation and resettlement detail (based on the Gulla package) in 1990/91, land owners demanded jobs with ECL and ECL, which is overstaffed and making heavy losses, was only prepared to offer what was prescribed by the law. The villagers of Ruidaspara refused to move to an already prepared resettlement village until ECL agree to new terms. ECL was finally able to resolve the stalemate after the Bank urged cancellation of this component and the West Bengal government intervened. At the request of the Bank ECL prepared a socioeconomic survey and a Rehabilitation Action Plan, based on the Gulla package, in 1994/95. Both have been reviewed by the Bank and found acceptable. In the end, ECL agreed to a fairly generous compensation package, which provided for jobs to land owners, as well as quite a few landless women, and cash allowances for crop losses and the relocation of households. The move to the new village was completed in May 1996. Tracer studies are being carried out under the Coal Sector Environmental and Social Mitigation Project (ESMP) and action plans will be formulated and implemented under that project for to raise the income level of any project-affected people from Sonepur-Bazari who are currently living under the poverty line.

10. At the same time it was evident that the mine design took little or no account of the practical difficulties that were likely to be encountered in the disturbance and resettlement of established communities. It was not realized, for instance, that the villages of Bazari and Sonepur could be left undisturbed in exchange for the abandonment of a very small proportion of the proposed mining area and tonnage. The mine design has since been modified in order to avoid both villages, thus almost eliminating the necessity for resettlement in their cases. A few families in Sonepur are to be housed temporarily on the other side of, but contiguous with, the village. This is to reduce nuisance from noise until operations have progressed past the area, at which time they will return to their previous homes. The occupations of project-affected people of the village of Punjabi Danga, on the southern side of Suri Road, are primarily concerned with road transportation. They have opted to move to a site near Asansol, provided and prepared by ECL, close to the Grand Trunk Road, which they anticipate will improve their opportunities for business.

Sonepur Bazari Environment

11. As in the Gevra mine, similar precautions are taken to minimize dust, noise and water pollution. Regular tests on water and air quality and noise levels consistently show results well in compliance with mandated standards. At the present time there is no excess advance excavation so there is no excess of overburden tipping above original ground level, nor should there be any occasion for such excess.

ANNEX D: SUMMARY OF THE GULLA PACKAGE

<i>Category of project-affected people</i>	<i>Compensation under the Gulla package</i>
Landowner	Compensation as per legal norm for land and crops lost and: a) all new and semi-skilled and unskilled jobs of the project are reserved for them. b) if no job is given, pro-rata subsistence allowance every month for 20 years c) suitable vocational training to landlosers to upgrade their skills for employment in other categories of jobs in the project on a preferential basis.
Homestead owners	Alternative house site
Infrastructure in resettlement site	Provided
Shifting and housing grant	Housing grant of Rs5,000 and shifting grant of Rs2,000

There is no provision in the Gulla package for adult members of the land/homestead owner's family; sharecroppers, land leasers, tenants and day laborers; squatters with houses; and tribals cultivating land under traditional rights or residing in villages in houses not owned by them. However, Coal India's current Resettlement and Rehabilitation Policy provides rehabilitation and/or housing for all of these groups.

In the case of Sonepur-Bazari, some jobs were given to landless tribals and women.

IMAGING

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