Report Number: ICRR0024184

1. Project Data

Project ID	Project Name
P145533	Contaminated Site Management Project
Country	**Practice Area(Lead)**
China	Environment, Natural Resources & the Blue Economy

L/C/TF Number(s)	Closing Date (Original)	Total Project Cost (USD)
TF-A0193	31-Dec-2021	14,280,851.59
Bank Approval Date	**Closing Date (Actual)**	
30-Apr-2015	30-Nov-2023	

	IBRD/IDA (USD)	Grants (USD)
Original Commitment	15,000,000.00	15,000,000.00
Revised Commitment	14,280,851.59	14,280,851.59
Actual	14,280,851.59	14,280,851.59

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2. Project Objectives and Components

a. Objectives

The Project Development Objective (PDO), as stated in the Grant Agreement (TF0A0193) under Schedule 1, page 5, is “to improve the country's capacity for managing site contamination and demonstrate environmentally sound identification and cleanup of sites contaminated with persistent organic pollutants (POPs) and other hazardous chemicals”. This formulation is identical to the one in the PAD (PAD938, page 12).

The PDO will be parsed, for the purposes of this review, as follows:

- To improve the country's capacity for managing site contamination.
- To demonstrate environmentally sound identification and cleanup of sites contaminated with persistent organic pollutants (POPs) and other hazardous chemicals.

b. Were the project objectives/key associated outcome targets revised during implementation?

No

c. Will a split evaluation be undertaken?

No

d. Components

Component 1: Capacity Development for Prevention and Control of Site Contamination (Total cost at appraisal:US$21.836 million, of which US$8.22 million Global Environment Fund (GEF) grant; Actual cost: US$24.04 million, of which US$10.42 million GEF grant). This component would support activities related to (i) the development of technical guidelines, policy recommendations, and financing options for contaminated site cleanup; (ii) knowledge sharing events, and training and awareness raising activities in support of prevention and control of site contamination; (iii) development of management tools, such as a national database of POPs-contaminated sites, feasibility studies, and environmental warning systems; and (iv) other technical assistance activities.

Component 2: Cleanup Demonstrations of Sites Contaminated with POPs and Other Hazardous Chemicals (Total cost at appraisal: US$50.00 of which US$6.03 million GEF grant; Actual cost: US$24.91 million, of which US$3.73 million GEF grant). This component would support activities related to the cleanup of up to 6 sites contaminated with persistent organic pollutants (POPs) and other hazardous chemicals located in the provinces of Chongqing (sites of Ganshui and Jingkou), Liaoning (Northeast Pharmaceutical Group site), and Guangdong (site of Qingyuan). The activities were to be carried out through a series of site investigations, risk assessments to determine remediation goals, tailored remediation programs, environmental and social management plans, and public consultations and information disclosure.

Component 3: Project Management (Total cost at appraisal: US$3.16 million, of which US$0.75 million GEF grant; Actual cost: US$3.26 million, of which US$0.85 million GEF grant). This component would support incremental operating costs associated with project management and day-to-day project implementation, procurement and financial management, and environmental and social safeguards functions carried out by the Project Management Units (PMU), including coordination and collaboration activities among national and local government agencies, nongovernmental agencies, and private sector actors (site owners, polluters or site redevelopers).

Changes to components

At the second restructuring the following changes in components took place:

Under component 1: (i) the introduction of risk management action plans for each contaminated site management process and a cross-sectoral information platform to facilitate decision-making; a study on

investigation, risk assessment and remediation techniques for sites contaminated with chlorinated paraffin; a study on odor investigation and control in contaminated sites; and technical guidelines for using specialized methods to screen dioxins in soil; (ii) a study on protection and safe use of contaminated agricultural land; a study on design and application of risk management and control technology for land reclamation; and (iii) additional knowledge sharing activities such as project communication and publication services. New activities under Component 2 involved additional measures in support of the cleanup activities at the Chongqing Jingkou site.

e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

Project cost. At appraisal, the total project cost was estimated at US$ 75.0 million, of which US$ 15 million GEF grant. The revised total project cost was US$ 52.21 million, of which 14.28 million GEF grant. The actual project cost was US$ 47.2, of which GEF grant of US$14.28 million. The actual GEF cost represents 95% of the initial GEF amount.

Financing. The Project was financed with a GEF grant of US$ 15.00 million (TF0A0193).

Borrower contribution. At appraisal, the planned borrower contribution was US$ 50.00 million. The actual borrower contribution was US$ 32.92 million. The contribution was reduced at the second restructuring, when funds were reduced from component 2, to which borrower funding was associated.

Dates

The project was approved in April 2015 and became effective in Sept 2015. The mid-term Review took place in October 2018. The original closing was in December 2021 and the actual closing took place in November 2023.

The project underwent two Level-II restructuring processes. The initial understanding of the concentrations and extent of POPs soil contamination at some of the sites turned out to be insufficient during the actual site remediation process. Further investigations were needed at these sites, requiring a more detailed diagnostic and additional time for completion. Additionally, as a consequence, some sites withdrew from the process.

- The first restructuring took place in December 2021 (RES48719), with the purpose of extending the closing date by 15 months, from December 31, 2021, to March 31, 2023.
- The second restructuring took place in March 2023 (RES54834), and comprised the following changes: a second extension of the project closing date by 6 months, until November 30, 2023; the reallocation of some of the undisbursed amount US$3 million from the grant between components, due to the withdrawal of 2 sites from the project. The disbursement estimates for the remaining grant amount as well as the Grant Agreement were revised accordingly. One additional intermediate outcome indicator was added to the Results Framework (“Information platform for contaminated site management and redevelopment at the local level”) with an end-target of having the platform established and functional by project closing. The withdrawal of the 2 sites (component 2) also had the consequence of the borrower's contribution being reduced from US$ 50 million to US$ 32.52 million.

A split evaluation is not undertaken, as there were no significant changes to the PDO or the PDO-related indicators and no significant reduction of targets during the restructurings.

3. Relevance of Objectives

Rationale

Context at appraisal

China's rapid industrial transformation over the past four decades has generated many economic benefits while at the same time contributing to environmental pollution and degradation, impacting the quality of soil, air, and water, with soil pollution and posing serious public health and environmental risks and an obstacle to further urban and rural economic development. By the early 2000s, soil pollution had begun contaminating the food chain with heavy metals, persistent organic pollutants (POPs), solvents, fertilizers, pesticides, and other organic contaminants, which were also polluting groundwater and surface waters. In 2001, China signed onto the Stockholm Convention on the elimination of POPs and aimed efforts at improving the legal and regulatory framework and prioritized the development of remediation technologies for contaminated sites. The GoC's vision was to have a national management system in place for soil protection by 2020, along with localized action on contaminated site management that would lead to a marked improvement in the country's soil quality. An amendment to the country's Environmental Protection Law was passed in 2015, establishing environmental protection as a top national priority, with a focus on local government enforcement.

However, several factors were hindering widespread effective management of contaminated sites in China, at the following levels: the legal and regulatory framework, the availability of public data and the management capacity. There were also technology and funding constraints. The project sought to introduce international experience of a risk-based approach, to demonstrate an environmentally and socially sound management process for the cleanup of sites contaminated with POPs and other toxic chemicals. Under the risk-based remediation approach, an environmental and human health risk assessment would be carried out to determine the need for removal and/or remedial action, to what extent, and in which locations (depending on the future use of the site). The intent was for the technical and managerial experience gained from the identification and cleanup demonstrations of POPs-contaminated sites to be disseminated nationwide, thereby contributing to the country's ongoing efforts to address site contamination and comply with the Stockholm Convention.

Consistency with Country Strategy

The Project Development Objective (PDO) was consistent with China's political vision and its strategy to improve the legal and regulatory framework, prioritize the development of remediation technologies for contaminated sites. In this context, China had signed the Stockholm Convention on the elimination of POPs and had officially enacted it. The National Implementation Plan (NIP) for POPs Reduction and Elimination was released in 2007, including a set of objectives for improving the legal and regulatory framework, and prioritized the development of remediation technologies for contaminated sites. A series of national policies and programs were launched to promote soil protection and environmentally sound management of contaminated sites. The GoC's vision was to have a national management system in place for soil protection by 2020, along with localized action on contaminated site management that would lead to a

marked improvement in the country's soil quality. An amendment to the country's Environmental Protection Law was passed in 2015, establishing environmental protection as a top national priority, with a focus on local government enforcement.

At closure, the project's PDO remained equally relevant to China's latest (the 14th) Plan on National Economic and Social Development (2021–2025). Chapter 38 of the 14th plan asserts the country's intentions to promote the management, control, and restoration of contaminated farmland and construction land, and emphasizes precise and systematic pollution management, coordination in reducing pollution and carbon emissions, continuous improvement to air and water quality, and effective management of soil pollution risks (ICR, page 12).

Consistency with Bank strategy

The project's objectives remained highly relevant to the World Bank Country Partnership Framework for China (FY 2020–25, Report No. 117875-CN). The project's efforts to reduce hazardous waste while strengthening the country's management capacity for prevention and control of soil pollution in the long run contributed under Engagement Area 2: "Promoting greener development," namely Objective 2.2: "Reducing Air, Soil, Water, and Marine Plastic Pollution." Furthermore, by materially reducing China's public exposure to contaminated land and increasing access to reliable and accurate environmental information, the PDO also remained consistent with the World Bank Group's mission of ending extreme poverty and boosting prosperity on a livable planet, and the UN Sustainable Development Goals, namely SDG 15 – Life on Land, SDG 9 – Sustainable Industrialization, and SDG 3 – Good Health and Well-being.

The project's PDO remained consistent with the objectives of the Stockholm convention (the GEF is the financial mechanism used by countries to undertake interventions towards the convention's goals). Among these, more specifically: "taking measures to ensure that POPs wastes are managed and disposed of in an environmentally sound manner; developing strategies for identifying sites contaminated by POPs" (https://www.thegef.org/partners/conventions).

Previous Bank experience

At appraisal, the World Bank counted on extensive experience working with other countries on site cleanup (Azerbaijan, India, Kazakhstan, Kosovo, Montenegro etc.) and lessons learned from these projects were incorporated into the project design. In China, two POPs demonstration projects supported by the World Bank and funded through the GEF had been completed, involving a cleanup of two chlordane and mirex production sites in Jiangsu. These two GEF-funded projects also provided valuable lessons that were incorporated in the project (PAD, page 17).

PDO level. The PDO, "to improve the country's capacity for managing site contamination and demonstrate environmentally sound identification and cleanup of sites contaminated with persistent organic pollutants (POPs) and other hazardous chemicals", is pitched at output and intermediary outcome level. The first part of the PDO (achievement of greater management capacity) is a means to a more ultimate outcome of a sustained reduction in contamination levels and improved public health. The second part of the PDO (demonstration of sound identification and cleanup) refers to obtaining concrete demonstrative examples that also contribute to the improved capacity and are pitched at output level.

Given the alignment of the PDO with the World Bank and country strategies and the project's clear rationale, the relevance is rated High.

Rating
High

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective
To improve the country's capacity for managing site contamination.

Rationale
Theory of Change (ToC)

The PAD did not include an explicit ToR, but the ICR (page 8) presented one as follows: the activities aiming at developing technical guidelines and policies, training on awareness raising and supporting soil pollution prevention and control, as well as developing management tools for contaminated site control on POPs (activities) are expected to lead to a set of guidelines (output), the policy recommendations (output), training modules and courses (output), and s set of management tools and the national database (outputs). These outputs were expected to lead to improved capacity for managing the contaminated sites (outcome, Objective 1). The longer term impacts were expected to be improved environmental and human health, sustainable urban (re)development and green growth trajectory in China.

There is a gap in the logical chain in the underlying assumption that “elaborated or issued” guidelines, policies and tools would automatically lead to improved management capacity. This gap could have been addressed by adding indicators reflecting the increased use of the new guidelines and policies and/or other measures of improved capacity, to better bridge the gap between the new available policies and guidelines and the change in behavior.

Outputs

- 10 selected priority technical guidelines (TG) and policy recommendations (PRs) for prevention and control of site contamination at the national and local levels were issued and 25 developed. The target did not specify the expected number of technical guidelines and policy recommendations; “Selected priority technical guidelines (TG) and policy recommendations (PRs) for prevention and control of site contamination at the national and local levels developed or issued”. It is thus not possible to assess to what degree the target has been achieved.
- 27 Training materials published and on-line training courses integrated into MEP staff training system. The target was only “Training materials published and online training courses integrated into the staff training system of MEP” and did not specify the number of materials or courses that would be expected to materialize. It is therefore unclear to what degree the target has been achieved.
- 22,518 people were trained on prevention and control of site contamination, of which 20,550 within the central government, 470 in Liaoning, and 1,498 in Chongqing. The target was only “as per annual

training plans" and did not specify the targeted number of trainings or people trained. It is therefore unclear to what degree the target has been achieved.

- The database that was created with the data from the remediation sites is integrated into the national contaminated land management database, which is fully operational, achieving the target to have the database integrated into the national contaminated land management database.
- As part of a public awareness campaign, six science films and other promotional videos and materials were produced. The distribution and outreach of these are unclear. Furthermore, as part of the same campaign, a science education center was established. It is unclear as to what degree the target of "having a public awareness campaign successfully implemented" was achieved.
- A feasibility Study for Knowledge and Remediation Center in Chongqing was completed, achieving the target of having completed a feasibility study.
- Regional Soil and Groundwater Contamination Prevention and Warning System at the Changshou Industrial Park was established, partly achieving the target to have a warning system established and functional.

Outcomes

- A national database of POPs contaminated sites was established and operational, achieving the target of having an operational national database. The ICR reports that the National Database has been integrated in the national information system hosted and managed by MEE.

The indicators lack specificity, as they do not present quantifiable targets. Furthermore, they do not specify the types of guidelines, policy recommendations, or trainings that are expected. In addition, the Results Framework lacked relevant indicators at the outcome level to measure the changes in the working practices on the new approach/response/management to site contamination that the project aimed to promote.

The lack of quantified targets makes it impossible to assess the level of project achievement compared to targets.

For the indicator regarding the national database, considering that no database existed before the project it would have been an adequate indicator to measure improved levels of transparency, coordination, and collaboration among stakeholders, and thus more effective management and remediation of contaminated sites. However, without any indicators to measure this, it is not possible to assess the degree of achievement. The operational database was meant to provide: (i) centralizing of the information and provision of a comprehensive repository of data on contaminated sites, including their locations, contamination levels, and remediation status; (ii) making data accessible; providing easy access to vital information for government agencies, facilitating informed decision-making and strategic planning; (iii) Allowing for continuous monitoring of contamination trends and the effectiveness of remediation efforts, helping to identify emerging issues and areas requiring attention; (iv) Resource Allocation: Assisting in prioritizing sites for remediation based on risk assessments and contamination severity, ensuring that resources are allocated efficiently and effectively. However, how and to what degree the database is used and how the usage changes practices have not been measured or documented, as no relevant indicators at outcome level were identified.

Given there is insufficient information on how the relevant institutions have transformed in terms of improved capacity for managing site contamination, Objective 1 is rated Modest due to a lack of evidence.

Rating
Modest

OBJECTIVE 2
Objective
To demonstrate environmentally sound identification and cleanup of sites contaminated with persistent organic pollutants (POPs) and other hazardous chemicals

Rationale
The theory of change that applies to Objective 2 is the following:

The activities regarding the identification and selection of up to 6 sites and the definition of the suitable remediation technology and processes for each site (activities) were expected to lead to soil remediation for those sites (output). This output was expected to lead to objective 2 of the PDO: demonstrating environmentally sound identification and clean-up of sites contaminated with POPs and other hazardous chemicals.

The ToC contains some gaps. The concept of " environmentally sound" is not defined. Furthermore, the ToC is lacking relevant outcomes to clarify what kind of changes would be expected to happen following the demonstration activities, linking the learning experience derived from the sites to the new practices that would be incorporated at national level. The measurement of how this would be assessed is also missing; appropriate indicators at outcome level that reflect and measure this outcome are missing. The question of attribution is difficult to assess, given the gaps in the ToC.

Outputs

- 423,388.04 metric tons of POPs & POPs waste were destroyed, disposed of or contained, of which 8,500 in Chongqing, 45,000 in Liaoning, and 370,000 in Qingyuan, exceeding the target of 79,000 metric tons.
- 191,575 people benefited from the site cleanups, of which 8,660 in Chongqing (4,330 or 50% females), 155,800 in Liaoning (77,900 or 50% females), and 27,115 in Qingyuan (13,557 or 50% females), exceeding the target of 8,100 people.

The reasons behind these enormous differences in targets and achievements (achievements of waste destroyed are more than five times the target, and the number of beneficiaries is more than 23 times the target) are not outlined in the ICR. This may be an indication of poor planning and targeting.

The remediation site of Qingyuan was added during implementation. It was one of the largest electronic waste dismantling and recycling centers in the country. This resulted in a large amount of dismantled waste that had accumulated. The estimation of this output at appraisal was based on a set of sites, but a few were dropped and others added during implementation.

Outcome:

- 8.6471 ha of contaminated land has been managed or dump sites closed under the project, exceeding the target of 5.20 ha.

The final surface intervened is higher than expected, while the number of sites is lower (4 instead of the expected 6). An explanation for how the lower number of sites is not negatively affecting efficacy is missing in the ICR (for instance, that the remediation processes were the same for the sites withdrawn than for the ones that remained, therefore not hampering the demonstration effect).

The number of beneficiaries is directly linked to the risk-based approach that is at the core of the intervention, used to manage risks of exposure of groups of people depending on their use of the site. Although improved health is not directly measurable after clean up, it is plausible that the site remediation will have a positive effect on people's health.

While the RF lacked indicators to measure sound identification of contaminated sites and improved identification protocols, the ICR refers to identification guidelines and identification training. It would have been useful, however, in order to demonstrate and measure the achievement of this part of the project (sound identification of contaminated sites), to have had both appropriate indicators and additional information in the ICR to show how identification protocols were strengthened and used.

The high achievement of the outputs (considerably higher than expected) led to a larger than expected surface area cleaned (outcome). This is due in part to the fact the specific sites and their remediation surface was unknown at the moment of appraisal, and the addition of sites with extensive areas of waste during implementation. The ICR acknowledges that the difference between the original and end-targets can be partially explained by the fact that these targets were conservative estimates at the time of project preparation and more accurate figures were expected during implementation based on more detailed site investigations. The achievement of Objective 2 is therefore rated Substantial.

Rating
Substantial

OVERALL EFFICACY
Rationale
The overall rating of Efficacy is Substantial with moderate shortcomings, as Objective 1 is only Modestly achieved while Objective 2 was substantially achieved.

Overall Efficacy Rating

Substantial

5. Efficiency

Economic efficiency

The ex-ante economic efficiency analysis presented in the PAD (page 65) focused on component 2, as that was the component that was most appropriate for a cost-benefit analysis and it represented 65% of the project budget. The analysis was applied to the 4 sites that seemed at the time more likely to participate. The EIRR for the 4 sites were the following: 8.7% (Nepharm), 29.2% (Sychem), 35.7% (Jingkou) and 55.2% (Ganshui). The project costs used in the economic analysis included the actual remediation costs only. The project benefits used included health benefits and incremental land value.

The ex-post analysis takes into account that during implementation, one site (Shenyang Chemical Plant) was dropped and Qingyuan Electronic Waste Disassembly Site added. The cost-benefit analysis does not apply to the Qingyuan Electronic Waste Disassembly Site as it does not generate much health benefit (few people live close by), and the treated land value is difficult to quantify for its possible use as a public park. The result is that 3 sites remain the same as at appraisal and they are subject to the comparison of the ex-ante and ex-post cost-benefit analysis. The results for the three comparable sites, at project completion, are the following: Nepharm 13.9%, Jingkou 67% and Ganshui 42.7%. For the case of Ganshui the ICR has taken the percentage proposed in the PAD in the case that the remediation treatment did not involve a cement kiln plant. However, the PAD presented an alternative cost-benefit analysis in case a cement kiln plant was involved. As this happened to be the case during implementation, it is the EIRR for that scenario that is taken in this assessment as the reference for comparison.

For two of the three compared EIRR, the analysis at closure yields higher results (by 5.1% higher for Nepharm and by 31.3% higher for Jingkou) and lower for Ganshui (by 12.5%). Overall, the ex-post analysis yields higher results than what was expected, with the caveat of having at closure only 3 sites for which the comparison can be undertaken, instead of the initial 6 planned at appraisal.

Other operational and administrative factors reported in the ICR as affecting efficiency:

- The project underwent a 23-month extension.
- The land clearing activities carried out in Qingyuan were stalled because lengthier consultations were needed with local villagers. This affected the construction progress and provoked delays. Implementation delays were also caused by (i) earlier financial and procurement issues and slow progress with identification of demonstration sites and disbursements; (ii) the COVID pandemic.
- The extensive experience of the central PMU (FECO) with project implementation was a key factor for project efficiency. It also served as National Coordination Group for the Implementation of the Stockholm Convention and maintained close contact with all stakeholders, facilitating cross-pollination between the national and provincial levels.

The results presented in the economic analysis and additional complementary factors justify a rating of Substantial Efficiency.

Efficiency Rating

Substantial

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal		0	0 ☐ Not Applicable
ICR Estimate		0	0 ☐ Not Applicable

* Refers to percent of total project cost for which ERR/FRR was calculated.

6. Outcome

High Relevance, Substantial Efficacy and Substantial Efficiency yield Moderately Satisfactory rating for Overall Outcome.

a. Outcome Rating

Moderately Satisfactory

7. Risk to Development Outcome

Government commitment risk There is a risk that the government may drop the remediation of the sites' contamination as a priority. Although the demonstrative objective has been achieved (objective 2), if the risk materializes, the efforts would not be maintained to expand the remediation intervention to other sites Although currently this is a small risk, given the policies and commitments in place (14th Five- Year Plan 2021–2025), there is some uncertainty beyond 2025, as the new Five-year Plan is not yet published and the priorities are not revealed.

Environmental risk There are two potential environmental risks: (i) that despite the remediation efforts, some levels of contamination remain; (ii) that during the remediation treatment some pollutants end up spreading outside the treatment areas and pose a health hazard for the technicians in the site and environing communities.

8. Assessment of Bank Performance

a. Quality-at-Entry

The project design took into account the lessons learned from similar projects in other countries and from projects in China that had benefitted from GEF funds. The lessons were laid out in the PAD (page 17).

For instance, the lesson regarding how it is important “to foresee unexpected events, financially and technically, as they nearly always occur during cleanup operations”, translated into anticipating the possibility of having to use a different remediation strategy for one of the sites, which is a risk that actually materialized for the case of Gushian. Due to this lesson, a cost-benefit analysis was calculated in case of materialization of this eventuality.

The risk assessment was comprehensive, and the mitigation measures adequate, such as, for instance, the need for a strong central PMU that would ensure stakeholder coordination and make up for the lack of capacity identified at the level of the two local PMUs.

The PDO is pitched at output/intermediary outcome level. The Results Framework has important shortcomings: the indicators identified at PDO-level were pitched at output level and were not specific nor measurable (type of materials was not specified and quantified targets were not identified). The RF fails to reflect the project’s results at outcome level, like e.g., measurements of improved capacity and measurements of decreased pollution levels. The PAD stated that 4 of the 6 sites were more likely to participate (page 63), which points at a possible overestimation of the target at appraisal, as the reality during implementation was that 4 sites indeed remained in the project.

While important aspects of Quality-at-Entry were in place, shortcomings related to lack of specified target values and lack of relevant outcome indicators in the Results framework warrant Quality-at-Entry rating of Moderately Satisfactory.

Quality-at-Entry Rating
Moderately Satisfactory

b. Quality of supervision
16 Supervision Missions were undertaken throughout the life of the project. They were held twice a year throughout the project life, except for the first and last year of implementation. Implementation Progress remained Moderately Satisfactory throughout most of the project life on account of delays in procurement and other activities – mainly related to Component 2, slow disbursement, and limited institutional capacity. There was a notable drop in ratings in 2021 when it became clear that there was insufficient time remaining to finalize the demonstration sites within the remaining project life. The restructuring was processed to extend the project life and allow for those activities to be completed toward achievement of the PDO. The team reacted to the delays in implementation during the first year of the project, caused by weak management capacity and slow disbursement procedures, and recruited technical experts to support the PMU and offering relevant trainings.

The MTR took place in Dec 2018, and there was agreement on the withdrawal of the Shenyang Chemical Plant from the project. However, this was not reflected in the first restructuring of 2021, to give enough time to identify new sites (to replace the Shenyang Chemical Plant and 2 more sites still pending identification). It was in the second restructuring of 2023 that the final group of sites was reflected.

The central PMU demonstrated commitment and autonomy, from hiring of consultants/international experts to playing a key role in integration and collaboration with and between the two provincial PMUs and the Bank.

A shortcoming is that the team did not take the opportunity, at either of the restructuring occasions, to address the shortcomings in the design of the RF to add concrete targets and more adequate indicators to better reflect the improved capacity so that they would be measurable and comparable against a plan. The ICR acknowledges that the difference between the original and end-targets is explained by the fact that these targets were conservative estimates at the time of project preparation and more accurate figures were expected during implementation based on more detailed site investigations. However, the targets were not updated. Supervision is hence rated Moderately Satisfactory.

Quality of Supervision Rating
Moderately Satisfactory

Overall Bank Performance Rating
Moderately Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design
The PDO, “to improve the country's capacity for managing site contamination and demonstrate environmentally sound identification and cleanup of sites contaminated with persistent organic pollutants (POPs) and other hazardous chemicals”, is pitched at intermediary outcome and outcome level. The first part of the PDO (achievement of greater management capacity) is a means to a more ultimate outcome of a sustained reduction in contamination levels and improved public health. The second part of the PDO (demonstration of sound identification and cleanup) refers to obtaining concrete demonstrative examples that also contribute to the improved capacity and are pitched at output level.

The RF does not include output level indicators that are specific (they do not have target values) and the indicators identified at outcome-level mainly represent outputs. More adequate indicators showing how the practitioners were making use of the new learned techniques are missing, in order to assess improved capacity. The progress toward achieving the PDO was to be monitored and collected by the national PMU and the other two local PMUs, from project beneficiaries, stakeholders and contractors. Additional studies were included as optional in case of need, in order to obtain effective data for justifying achievements of the PDO. Capacity building on M&E was to be provided to the PMUs as needed. The cost for the M&E activities were included in Component 1. A mid-term review was planned for 2018 (PAD, page 57).

The RF has significant shortcomings in its design in that several of the indicators lack specific and quantifiable targets, and expected project outcomes lack appropriate indicators at outcome level. The management capacity (Objective 1) lacked indicators to measure use and application of the new approaches (guidelines, policies, etc.) and subsequent changes in practice. This causes difficulties in measuring project achievements against targets, and in measuring and demonstrating how and to what

degree the project has contributed to its objective to improve the capacity of site contamination management.

b. M&E Implementation

The MTR was conducted as planned (in 2018). The central and provincial/local PMUs conducted regular M&E of project implementation, identified and addressed issues, and formulated corrective actions. The World Bank provided the necessary training to facilitate smooth oversight, monitoring, and reporting. Data on the results indicators were regularly collected by the PMUs from beneficiaries, stakeholders, and contractors, and validated by third parties. In addition, a technical support and management team was established with domestic and international experts to support the PMUs with the design of activities, quality review of results, and environmental and social aspects. The World Bank participated in these technical discussions, and brought in additional international experience, as required. The option of commissioning additional studies to justify achievements (planned at appraisal if necessary) was not used.

The shortcomings in the design of the RF and its indicators were not corrected during implementation (description of indicators including specific targets, inclusion of indicators at outcome level). The ICR acknowledges that some targets were conservative estimates at the time of project preparation and more accurate figures were expected during implementation based on more detailed site investigations, but these were never updated.

c. M&E Utilization

The M&E findings facilitated some adaptation of the activities. For instance, the indicator measuring progress on remediation allowed for timely adjustments and changes in strategy, as was the case for the Chongqing and Liaoning provinces. The local PMUs collaborated with the central PMU to address issues and formulate next steps. This process was embedded in the project design, given the need to adjust remediation plans depending on successes or challenges of the remediation testing and trials.

M&E Quality Rating

Modest

10. Other Issues

a. Safeguards

The project was a Category A – Full Assessment due to the complexity of the targeted contaminated sites and the potential environmental and health risks, thereby triggering the Environmental Assessment (OP/BP 4.01) and Physical Cultural Resources (OP/BP 4.11) policies (due to the possibility of chance findings at the treated sites during excavation). The Indigenous Peoples (OP/BP 4.10) and Involuntary Resettlement (OP/BP 4.12) policies were also triggered provisionally, since not all project sites were known at the time of appraisal. During implementation, the project did not identify any ethnic minorities, cultural or historical sites, either within or in the vicinity of the project sites. However, Involuntary Resettlement was triggered, as there

was need for land acquisition at one of the project sites during project implementation (Chongqing Jingkou). To ensure the land acquisition was compliant with the relevant national and municipal regulations, under the ESMF, the local PMU conducted a due diligence on land use of the site, particularly to resolve the land rights issues. A Resettlement Due Diligence Report was prepared as well as an Involuntary Resettlement Action Plan, both of which were satisfactory to the World Bank. Throughout project implementation, particular attention was paid to the prevention and control of secondary pollution during the remediation process, in accordance with the Environmental and Social Management Framework (ESMF). Specialized agencies were hired to conduct environmental and social impact assessments during site remediation, as well as detailed analysis of potential environmental and health risks during construction processes, and based on this, an Environmental and Social Management Plan (ESMP) was formulated. A process was developed to screen the locations of remediation sites based on environmental and social criteria. The measures identified in the ESMP and it related M&E and reporting system had a strong reference value for professionals in China's Contaminated Site remediation field. The full assessment was disclosed on May 31, 2014, the executive summary of the environmental assessment was disclosed on October, 15, 2014, and volumes dedicated to specific sites were disclosed during the life of the project and before works began.

When 10 new activities for on-site pollution prevention were introduced at the second restructuring (March 2023) the project engaged a third-party expert. Guided by the World Bank's Environmental and Social Framework (ESF), General Guidelines on Environmental Health and Safety, the Office of Export and Secure Research Compliance Advisory Note Technical Assistance, and the ESMF for this project, terms of reference were developed for the new activities, environmental and social risks were identified, and environmental and social impact assessments were conducted to eliminate or mitigate any negative impacts.

The project complied with environmental and social safeguards.

b. Fiduciary Compliance

Procurement

The central PMU had prior experience managing World Bank-financed projects and ensured the correct application of procurement policies and procedures. The provincial and local PMUs had more limited capacity and experience, which resulted in procurement delays during the first few years of the project. The World Bank provided specialized management training during project initiation and throughout implementation, and technical experts were enlisted by the PMUs to enhance the PMU's capacity in procurement and contract management. This led to accelerated procurement performance in the later stages of implementation.

Financial management

The project maintained a stable financial management team that was well versed with the use and methods of grant-based funding and managed it in accordance with World Bank requirements. Initial delays in disbursement caused by limited capacity at the provincial and local PMUs were overcome through frequent coordination with the central PMU. Audit reports were issued annually and found to be

compliant, with unqualified opinions. The required Interim Financial Reports were generally submitted on time and no unusual activity was identified.

c. Unintended impacts (Positive or Negative)

The ICR reports that as a consequence of the communication of the project's good experiences to legislative bodies in a timely manner throughout implementation, the project contributed to the establishment of the Soil Pollution Prevention and Control Law, the establishment of a database of polluted sites, a demonstration information management platform, and set the technical standards that would support implementation of the new law.

d. Other

Mobilizing Private Sector Financing

The project involved the private sector in the remediation process by way of the remediation technology – pilots, testing, and implementation – and redevelopment of the sites. Examples of private sector interventions include the piloting of treatment technologies in Chongqing real estate for the new residential development at Northeast Pharmaceutical Group in Liaoning province. The project has also enabled planning for development under a public-private partnership of a knowledge and remediation center in Chongqing and supported research on potential financing options (including public-private partnerships) and market incentive measures for remediation.

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Highly Satisfactory	Moderately Satisfactory	The Efficacy rating is Substantial, as there are shortcomings in the evidence provided for some of the outcome indicators, and relevant indicators to measure outcome is lacking.
Bank Performance	Satisfactory	Moderately Satisfactory	There are shortcomings at entry level regarding the lack of target values and relevant indicators. These shortcomings were not addressed during supervision or at restructurings.
Quality of M&E	Substantial	Modest	There were significant shortcomings in the Results Framework (lack of target values

			and lack of relevant outcome indicators) leading to difficulties in measuring and demonstrating expected project outcomes.
Quality of ICR	---	Substantial	

12. Lessons

The following lessons have been drawn from IEG:

When indicators to measure behavioral changes and increased performance of public officials are lacking it is not possible to measure to what degree performance is changing, in order to assess the improved management capacity of the institutions. In this project, indicators in the RF measured the production and availability of guidelines, policies and training materials, but failed to measure the changes in behavior (the applied new skills) that would better show the changes in the capacity among officials and other stakeholders, regarding the approach of risk-based analysis for site remediation.

When target values are lacking in the Results Framework, it is not possible to assess project success as the degree of project achievement cannot be compared to target values. In this project, relevant target values for output indicators were not set and neither updated during implementation. This made it not possible to assess project achievement against targets.

The following lessons from the ICR (rephrased) are considered particularly relevant:

Balancing technical, economic, and social dimensions of the project can increase the probability of success of remediation approaches. The remediation of contaminated sites is a complex environmental issue that requires the consideration of the trade-offs. The implementation of stakeholder engagement appeared essential to ensure timely remediation and build trust within the population toward the remediation plan. Similarly, the ESMP has proven an efficient instrument to effectively avoid or mitigate potential social conflicts.

Ongoing audits and controls during the remediation process can contribute to building a demonstration effect. It was in the pilot nature of this project to allow for flexibility and changes in the technical approaches selected for site remediation. Due to the controls on the counterpart side the inspections revealed important data (on levels of contamination, for instance) that allowed for reconsidering the approaches and to learn from the process.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR is well structured, parses the PDO logically and describes the components adequately. The report is consistent and presents a logical linking and integration of its various parts. The sections on relevance and efficiency are complete. The ICR provides good coverage of the implementation experience. It is focused on results and provides substantial information beyond the indicators to provide a complete picture on the project's results. The ICR's lessons are useful. The team provided written responses to IEG's questions to supplement the information provided in the ICR.

There are some shortcomings regarding the discussion on achievements, which failed to identify shortcomings in lacking target values and relevant outcome level indicators. Overall, the ICR is rated Substantial.

a. Quality of ICR Rating
Substantial