



OFFICE OF INSPECTOR GENERAL

AUDIT OF USAID/JORDAN'S WATER AND WASTEWATER INFRASTRUCTURE PROJECT

AUDIT REPORT NO. 8-278-15-001-P
JANUARY 20, 2015

FRANKFURT, GERMANY



Office of Inspector General

January 20, 2015

MEMORANDUM

TO: USAID/Jordan Mission Director, Beth Paige

FROM: Regional Inspector General/Frankfurt, James C. Charlifue /s/

SUBJECT: Audit of USAID/Jordan's Water and Wastewater Infrastructure Project (Report No. 8-278-15-001-P)

This memorandum transmits our final report on the subject audit. We considered carefully your comments on the draft report and have included them, without attachments, in Appendix II.

The report includes two recommendations to help the mission address the issues identified by our audit. We acknowledge management decisions on Recommendations 1 and 2 and final action on Recommendation 2. Please provide the necessary documentation to obtain final action on Recommendation 1 to the Audit Performance and Compliance Division in the Office of the Chief Financial Officer.

I appreciate the cooperation and courtesy extended to my staff during the audit.

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SUMMARY OF RESULTS

Water is a scarce resource in Jordan. According to forecasts by the World Health Organization, it will become increasingly scarce as the nation's population increases.¹

The Jordanian Government launched a new water strategy in 2008 to increase the amount of water it has from new sources and to use treated wastewater more efficiently. In line with this and U.S. Government development policy, USAID/Jordan awarded a 5-year, \$34.1 million task order in May 2010 to CDM International Inc. to implement the Water and Wastewater Infrastructure Project. (Jordan relies almost entirely on international donors like USAID to fund multimillion-dollar capital improvements for its water and wastewater networks because it lacks the revenue to improve infrastructure independently.) As of May 2014, it had spent \$20.5 million.

This project was designed to provide engineering assistance by preparing master plans and studies to identify and prioritize short-, intermediate-, and long-term water and wastewater infrastructure needs in the governorates of Amman, Jerash, Ma'an, and Tafilah. After the plans and studies were completed, project staff would design and oversee the construction of immediate upgrades for the governorates' water and wastewater infrastructure, which would be funded by the Jordanian Government or other international donors—including USAID.

According to the studies, the infrastructure in some governorates is at or past capacity and has exceeded its useful life. In other governorates, the infrastructure is not sufficient to distribute water from new sources, like the Disi aquifer which now provides water for parts of Amman.

In addition, the Jordanian Government does not have updated digital records of its water and wastewater networks in the target governorates, and these records are needed to operate, maintain, and manage the infrastructure. Not having digital records also limits the government's ability to plan for future infrastructure requirements.

The Regional Inspector General/Frankfurt (RIG/Frankfurt) conducted this audit to determine whether USAID/Jordan's Water and Wastewater Infrastructure Project was meeting its purpose to provide engineering support to the Jordanian Government (page 3). We found that it had done so through completing the following activities.

- Converted paper records and drawings of water and wastewater networks to digital computer-based systems.
- Created water and wastewater master plans for the four target governorates.
- Created detailed designs for two new wastewater treatment plants in Jerash and Tafilah.
- Oversaw the construction of new pipe networks and a water pumping station in Amman.

However, in reviewing this contract and reviewing past USAID projects, we found that the Jordanian Government was not recovering all the costs for operating, replacing, and building infrastructure. This is an inherent condition within Jordan that ultimately prevents the water

¹ <http://www.who.int/heli/pilots/jordan/en/>

sector from becoming truly sustainable (page 6).

In addition, mission officials did not review certain information and omitted other information while certifying the Tafilah wastewater treatment plant as required by Section 611(e) of the Foreign Assistance Act of 1961, as amended (page 8).

To address these problems, we recommend that USAID/Jordan:

1. Prepare a new 611(e) certification memo that discusses all issues regarding Tafilah Governorate raised by the Water and Wastewater Infrastructure Project and other USAID-funded projects. The memo also should discuss the Jordanian Government's ability to maintain a capital project, so the Mission Director can make an informed decision about funding for the planned Tafilah wastewater treatment plant (page 9).
2. Establish guidelines on how to prepare 611(e) certification memos that include all necessary information and staff roles and responsibilities in the certification process (page 9).

Detailed findings appear in the following section. Appendix I has information on the scope and methodology. Our evaluation of management comments is included on page 10, and the full text of management comments is in Appendix II.

AUDIT FINDINGS

Infrastructure Project Addressed Some Critical Water Issues in Jordan

To help the Jordanian Government implement its water strategy, and in keeping with USAID/Jordan's country strategy, the mission designed the Water and Wastewater Infrastructure Project to be an umbrella contract for various types of architectural and engineering services related to planning, designing, and overseeing infrastructure projects.

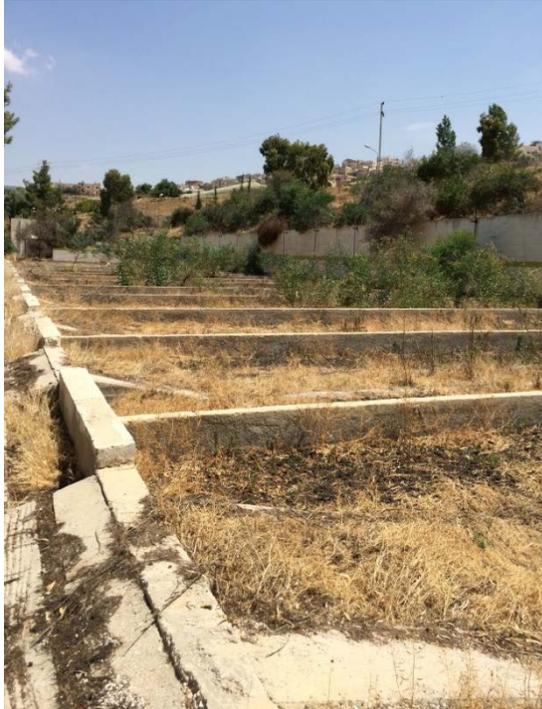
The project had several phases. The first was to create and update a geographical information system (GIS) from old paper records and maps stored in the offices of the Water Authority of Jordan and its operators in Amman, Jerash, Ma'an, and Tafilah. The records had information about existing water and wastewater pipes.

CDM successfully implemented or updated a GIS in each governorate. This gives government planners and water operators the ability to review information about the pipe networks in specific areas of a city or region, and to forecast infrastructure needs by using hydraulic modeling—a type of analysis to predict exactly what type of pipe and related components are needed throughout a neighborhood, city, or governorate.

Although the intent was to have water operators in Ma'an and Tafilah use these new systems, it was not clear how many actually were. Officials from the Ministry of Water and Irrigation and water authority said they were using the systems, but staff in the governorates were not.

In the second phase, the project developed a water and wastewater master plan in the four governorates. The plans use estimated population changes—mostly increases—and the effect they would have on the water and wastewater infrastructure. This then enables the government to prioritize upgrades, such as replacing old pipes and pumps or installing bigger ones to meet the increased demand for services in 5-year increments through 2035. This type of planning is necessary to make sure limited funds are spent only on the most urgent needs.

The Jordanian Government used the master plan for Amman to develop a list of priorities for directing a new water supply from the Disi aquifer, as shown in the photos on the next page. They were separated into three phases, and international donors provided most of funding for each phase. Construction for the first two was ongoing; the first phase is paid for by the German Government, and a USAID grant covers the second.



CDM redesigned various stages and components of the wastewater treatment plant in Jerash. A USAID grant worth between \$24 million and \$30 million will be used to replace it with one based on CDM's designs. (Photos by RIG/Frankfurt, May 2014)

In the third phase, the project was to design new water and wastewater infrastructure systems. To date, CDM has initiated or completed designs for wastewater treatment plants in Jerash, shown in the photos above, and Tafilah and water pipe upgrades in Amman, shown in the photos on the next page. The Jordanian Government used those designs to award construction contracts. In the case of the treatment plants, the designs should enable the governorates to treat the wastewater so it meets environmental regulations and can be reused for agricultural purposes.



Workers in Amman dig a trench for new pipes. (Photos by RIG/Frankfurt, May 2014)

For the fourth phase, CDM is managing the Jordanian contractors that are building new water pipes and pumps in Amman, shown in the photos above and below. A team from CDM was on site daily observing the contractors' work, inspecting the quality of the construction, and making sure it met design specifications and other government regulations. Construction management supervision like this is in line with best practices.



To install water pipes, workers dug a trench along a road (left). A CDM inspector checks a sample of the soil (center) that covered the pipe before the road was repaved (right). (Photos by RIG/Frankfurt, May 2014)

The Water and Wastewater Infrastructure Project met Jordan's needs for several reasons. It was designed to use architectural and engineering best practices and to address specific critical issues in four target governorates. The scope has been modified over time to be responsive to changing needs. CDM is a qualified U.S.-based architectural and engineering firm with skilled, knowledgeable employees who have worked with the many different government organizations that oversee the water sector in Jordan. The USAID contracting officer's representative (COR) responsible for the project was an engineer who had worked extensively with the Ministry of

Water and Irrigation.

Because of the project's accomplishments to date, the Jordanian Government has improved its ability to manage and address the water crisis. Jordanian officials and those from other international organizations said they would like the same type of USAID project implemented in other governorates and sectors. For example, water and wastewater master plans and new infrastructure systems are needed in the northern governorates because of the influx of refugees due to the Syrian crisis. German Government officials said they would pay for infrastructure projects based on CDM's master plans and designs in the future, if that coordination was available again.

Jordanian Government Did Not Charge Enough Through Water Tariff to Pay for Infrastructure

The Foreign Assistance Act of 1961, as amended, requires development programs to follow certain principles with the goal that a developing country will “achieve self-sustaining growth and to provide opportunities to improve the quality of life for their people.” Countries also are required to use their own institutions and financial resources to help achieve a program or project goal.

Some of the act's other principles are listed below.

- Development goals should be established by the host country, and assistance provided to meet those goals should be done collaboratively.
- Programs should be directed to work on “critical problems.”
- Programs should be designed and implemented with the support of other countries and organizations to meet the same development goal.
- The U.S. Government should encourage policy reforms to help economic growth.
- Programs and money “shall be used in support of, rather than substitution for, the self-help efforts that are essential to successful development programs” with programs focusing on countries that are taking “positive steps to help themselves.”

The project was designed to follow most of those principles. For example, the Jordanian Government—through the Ministry of Water and Irrigation—has a water strategy with specific goals established through the year 2022. The project's tasks complemented this by providing useful master plans and studies in select governorates. In addition, as mentioned in the summary, the nation is facing water shortages, which is a critical problem for the Jordanian Government and people. Last, CDM's designs are being used by other countries, like Germany, and organizations to fund important construction projects that expand and improve the water and wastewater sector.

However, the fourth principle is not being addressed. USAID has found problems with Jordan's fiscal situation for decades in the water and wastewater sector.² Current water tariffs do not

² RIG/Cairo's Audit Report No. 6-278-12-002-P *Audit of USAID/Jordan's Design for Sustainability in Its*

generate enough revenue to cover the costs of operations, maintenance, replacing equipment, or new construction. Therefore, USAID funds continue to be used for capital projects because the Jordanian Government has not made policy reforms to increase the water tariff to cover the true cost of building, operating, and maintaining infrastructure.

Mission officials said other projects are working on the issue of water subsidies. However, the Jordanian Government has chosen to address energy subsidies first, which have a larger fiscal impact on the country. The government has made a strategic decision not to increase prices for both energy and water at the same time because both are considered essential services for all Jordanians. The officials said increasing prices for them at the same time could potentially create social unrest.

A senior executive from Miyahuna, Amman's water company, echoed USAID/Jordan's observations, explaining that the lack of capital funding for infrastructure investment is a major problem, but the current government is unwilling to increase the price of water yet because of potential repercussions. It is unclear how the population would respond to a tax increase, and both the Jordanian and U.S. Governments want to maintain the country's stability.

The scope of this project did not include activities to address policy reforms, but USAID/Jordan is using others to help the water authority determine the true cost of water; these projects should provide the Cabinet of the Prime Ministry with information it needs to justify increased tariffs. USAID/Jordan is also implementing programs to help water operators in various governorates become more efficient and address illegal water sales.

Mission officials said the Jordanian Government is determined to start increasing the water tariff in 2015 in hopes of recovering all operations and maintenance costs by 2020. However, this still does not address costs for construction of new facilities. In 2014 USAID certified that approximately \$60 million was available for two new wastewater treatment plants in Jerash and Tafilah and pipe-related upgrades in Amman. These types of projects could continue indefinitely as they have for decades until the Jordanian Government changes policies to facilitate sustainability.

Until the Jordanian Government makes the needed policy reforms to address the water tariff, expenses in the water and wastewater sector will continue to exceed revenue and the government will run a deficit. This means that foreign governments and other donors, like USAID, will have to continue to support Jordan by building multimillion-dollar water and wastewater infrastructure systems.

However, we do not make any recommendations at this time because (1) the project was not designed to work directly on policy reforms related to the water tariff, (2) the political sensitivities of the water tariff, and (3) other interventions planned by the mission.

Water Resources Program, dated December 22, 2011, found that agricultural demands for water were affecting Jordan's water sector.

USAID/Jordan Did Not Thoroughly Review Certification That Project Will Be Maintained

Before USAID pays for a capital project worth more than \$1 million, Section 611(e) of the Foreign Assistance Act of 1961³ requires a certification of a country's capability "to effectively maintain and utilize the project taking into account among other things the maintenance and utilization of projects in such country previously financed or assisted by the United States." The Mission Director is responsible for making the decision to certify that host-country governments have the financial and human resources needed to maintain and use the new projects.

On May 10, 2014, USAID/Jordan's Acting Mission Director certified in a memo to USAID's Assistant Administrator for the Middle East that the Jordanian Water Authority had the capability to maintain and use a new wastewater treatment plant in Tafilah Governorate that was worth about \$18 million. However, she did so without considering staffing, operational, maintenance, and fiscal issues that CDM identified in studies paid for by USAID.

Additionally, the sources cited in the certification memo had information and conclusions that were potentially misleading. One report cited was older than CDM's report, and other reports did not include examinations of facilities in Tafilah Governorate, which were necessary for an updated, detailed consideration of the government's capabilities in this governorate. One "comprehensive review" cited in the certification—which did not actually discuss infrastructure in Tafilah—could not be found; the COR who wrote the certification memo used findings taken directly from an older memo.

Six mission managers reviewed the certification before it was approved by the Acting Mission Director. Some of them admitted that they cleared it without asking for the documentation to check its accuracy. In addition, some mission employees admitted that they were not aware of the CDM studies. The Deputy Mission Director also agreed that the 611(e) certification could have been better prepared.

Mission managers depend on the COR's summary of relevant project information—part of the 611(e) memo—to make informed decisions before moving forward with a specific capital project. USAID produces an abundance of reports on numerous subjects throughout the mission, and it would be unreasonable to expect each manager to be aware of all the details in each report. Because of this, the COR provides a condensed summary in the draft 611(e). However, in this instance, the summary did not address issues raised from all the relevant project reports.

The 611(e) certification process is a legal requirement that is meant to ensure that the U.S. Government's capital investments in any country are maintained and used. Studies that CDM conducted for the Water and Wastewater Infrastructure Project and other studies from USAID/Jordan programs going back decades have raised serious concerns about the Jordanian Government's fiscal policies, staffing, and operations and maintenance of water- and wastewater-related infrastructure. Because this information was not completely and accurately discussed in the certification memo, and because USAID/Jordan managers did not review the memo thoroughly, it is unclear whether the Jordanian Government has the necessary financial

³ Codified at 22 U.S.C. 2361(e).

and human resources to maintain USAID's \$18 million investment for the new wastewater treatment plant in Tafilah. Therefore, we make the following recommendations.

Recommendation 1. We recommend that USAID/Jordan prepare a new 611(e) certification memo that discusses all issues regarding Tafilah Governorate raised by the Water and Wastewater Infrastructure Project and other USAID-funded projects. The memo also should discuss the Jordanian Government's ability to maintain a capital project so the Mission Director can make an informed decision about funding for the planned Tafilah wastewater treatment plant.

Recommendation 2. We recommend that USAID/Jordan establish guidelines on how to prepare 611(e) certification memos that include all necessary information and staff roles and responsibilities in the certification process.

EVALUATION OF MANAGEMENT COMMENTS

USAID/Jordan agreed with both recommendations. Based on comments from the mission and supporting documentation, management decisions have been reached on both, as well as final action on Recommendation 2.

Recommendation 1. USAID/Jordan concurred with the recommendation and will issue a new 611(e) certification memo addressing those issues identified in the audit finding. The mission has set a target completion date for February 26, 2015. We acknowledge the mission's management decision.

Recommendation 2. USAID/Jordan concurred with the finding. On December 9, 2014, it issued Mission Order No. 200-201-04, which provides guidance on staff roles and responsibilities for the development of 611(e) certifications. We acknowledge the mission's management decision and final action.

SCOPE AND METHODOLOGY

Scope

We conducted this performance audit in accordance with generally accepted government auditing standards. They require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions in accordance with our audit objective. We believe that the evidence obtained provides that reasonable basis.

The purpose of the audit was to determine whether USAID/Jordan's Water and Wastewater Infrastructure Project was meeting its purpose of providing engineering infrastructure support to the Jordanian Government. The mission awarded CDM a \$34.1 million task order with an effective date of May 4, 2010, to May 3, 2015.

The audit covered activities implemented from May 4, 2010, through May 31, 2014. USAID/Jordan had obligated \$29.5 million and disbursed \$20.5 million through this period. Because this audit focuses on performance instead of specific financial transactions, the team limited financial disbursement testing to the COR's procedures for reviewing invoices and supporting documentation.

The overall project was divided into six tasks.

1. Zarqa wastewater facilities
2. Greater Amman water and wastewater systems
3. Jerash City wastewater treatment plant
4. Tafilah and Ma'an water and wastewater systems
5. Reuse Knowledge Center Petra
6. Cover other engineering services for selected small-scale water and wastewater projects as identified by USAID and in coordination with the Water Authority of Jordan.

The scope of the audit was limited to Tasks 2, 3, 4, and 6 because 1 and 5 were deleted from the contract.

In planning and performing the audit, we assessed and tested relevant management controls related to documentation and data verification, reporting, supervisory and management reviews, and approvals of infrastructure and procurement-related activities.

Fieldwork took place in Jordan from May 18 to June 8, 2014.

Methodology

To answer the audit objective, we interviewed mission employees, CDM staff, Jordanian Government officials at the Ministry of Water and Irrigation and the Water Authority of Jordan, the Amman water and wastewater system operator (Miyahuna), officials from a German development bank (KfW), and local construction contractors.

We reviewed and assessed the following documents provided by USAID/Jordan and CDM: program design documents, contract deliverables, the completed GIS, host-country construction contracts, construction priority letters from the Jordanian Government, and other relevant documents. We also reviewed applicable laws and regulations, and USAID policies and procedures to include the Foreign Assistance Act of 1961, as amended.

Site visits were limited to two of the four governorates in Jordan; we could not visit Ma'an and Tafilah because of security problems, timing, and no construction activities had begun there. However, we did visit Jerash, where the project is scheduled to provide construction management services for a new wastewater treatment plant, and locations throughout Amman, where construction on new water pipes and a pump station was ongoing. We judgmentally selected these because they represent two out of three construction projects in which USAID was planning to award grants worth approximately \$24 million and \$15 million, respectively, for host-country construction contracts in 2014.

The audit results cannot be projected to all project activities. For the construction activities we selected, we validated that deliverables were completed and submitted to USAID/Jordan and that CDM included the local government or ministries and beneficiaries in the design and selection phase of the project. We observed rehabilitation activities when applicable and met with beneficiaries to confirm the quality of CDM's work.

MANAGEMENT COMMENTS



MEMORANDUM

TO: James C. Charlifue, Regional Inspector General

FROM: Beth S. Paige, Mission Director/s/

DATE: December 11, 2014

SUBJECT: Audit of USAID/Jordan's Water and Wastewater Infrastructure Project (Audit Report No. 8-278-15-00X-P)

REFERENCE: JCharlifue/BPaige Memo dated November 25, 2014

Thank you for providing the Mission with the opportunity to review the subject draft audit report. Discussed below are the Mission's comments on the recommendations in the report.

Response to Audit Recommendations

Recommendation 1. *We recommend that USAID/Jordan prepare a new 611(e) certification memo that discusses all issues regarding Tafilah Governorate raised by the Water and Wastewater Infrastructure Project and other USAID-funded projects. The memo also should discuss the Jordanian Government's ability to maintain a capital project, so the Mission Director can make an informed decision about funding for the planned Tafilah wastewater treatment plant.*

Mission Response: USAID/Jordan concurs with this recommendation and will issue a new Section 611(e) Certification for the Tafilah waste water treatment plant that will address the findings raised in the draft report and fulfill the actions set forth in the recommendation.

Target Completion Date: February 26, 2015. The Mission deems that a management decision has been reached on Recommendation 1.

Recommendation 2. *We recommend that USAID/Jordan establish guidelines on how to prepare 611(e) certification memos that include all necessary information and staff roles and responsibilities in the certification process.*

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Mission Response: USAID/Jordan concurs with the recommendation to establish guidelines in preparing the 611(e) certifications. To that end, on December 9, 2014, the Mission issued Mission Order No. 200-201-04 providing guidance on staff roles and responsibilities in the preparation of Section 611(e) Certifications (Attachment 1).

Target Completion Date: The Mission deems that appropriate actions have been taken to address Recommendation 2. We, therefore, request the RIG's acknowledgment to the management decision and concurrence with its closure upon issuance of the report.

Attachments:

- 1- 611(e) Preparation Certification Guidelines MO

cc: M/CFO/APC
DMD: LTatem
ADMD: JDunlop
WRE: MKnight
FMO: RShire
OPM: DSanchez-Bustamante
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