



ADVANCING DEVELOPMENT EFFECTIVENESS

Evaluation Design Report

MCC Lesotho Water Sector Project

Metolong Program & Urban and Peri-Urban Water Activity

Process Evaluation



May 2017

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EVALUATION DESIGN REPORT

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Process Evaluation

May 2017

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ABBREVIATIONS

CoW	Commissioner of Water
DCSE	Design and Construction Supervising Engineers
EDR	Evaluation Design Report
ERR	Economic Rate of Return
FDI	Foreign Direct Investment
GoL	Government of Lesotho
HLP	High Lift Pumps
HQ	Headquarters
IE	Impact Evaluation
IRB	Institutional Review Board
ITT	Indicator Tracking Table
KII	Key Informant Interview
LEWA	Lesotho Electricity and Water Authority
LHDA	Lesotho Highlands Development Authority
LLP	Low Lift Pumps
LMDA	Lesotho Millennium Development Agency
MA	Metolong Authority
MDP	Ministry of Development Planning
M&E	Monitoring and Evaluation
MCA-L	Millennium Challenge Account-Lesotho
MCC	Millennium Challenge Corporation
MI/d	Megaliters per day
MP	Metolong Program
MPMU	Metolong Program Management Unit
NRW	Non-revenue water
O&M	Operations and Maintenance
PIU	Project Implementation Unit
SI	Social Impact
UPUW	Urban and Peri-Urban Water
WASCO	Water and Sewerage Company
WTW	Water Treatment Works

1 INTRODUCTION & BACKGROUND

1.1 Country context

Similar to many countries in sub-Saharan Africa, Lesotho's urban population has grown rapidly in recent decades. Job opportunities in Maseru, Lesotho's capital, in the water-intensive textile and garment industry, have contributed to urbanization, along with natural population growth and expansion of peri-urban areas. By 2008, domestic and industrial demand for water in urban areas was rising faster than available supply. Supply constraints and aging network infrastructure contributed to a reported decline in reliability, which made it even more difficult for the utility to maintain service levels for existing customers and nearly impossible to expand coverage to unserved areas, despite pressures to achieve targets for increasing access for urban residents. Further, the need to attract foreign direct investment (FDI) for expansion and growth of the textile and garment industry in a dynamic economic context was seen to depend heavily on a secure, reliable supply of water.

To address these problems, as part of its first Compact with the Government of Lesotho (GoL), the Millennium Challenge Corporation (MCC) invested in rehabilitating and upgrading urban water infrastructure while also co-financing the Metolong Program, which included a dam, water treatment works (WTW), new pumping stations, and downstream conveyance, in order to dramatically increase the supply of water available throughout the network to meet rising demand. MCC funded the WTW, pumping stations, and the program management unit that coordinated the entire program.

1.2 Objectives of this report

This design report presents SI's approach to evaluating the implementation of the Metolong Program and Urban and Peri-Urban Water (UPUW) Activity. SI's evaluability assessment included a recommendation to sequence the evaluation, first conducting a process evaluation focusing on implementation, and using the results to inform the impact evaluation (IE) design, which would focus more on household impacts. This recommendation was based on preliminary indications that some Compact-funded infrastructure is not fully functional and thus not likely to have had the chance to deliver results to date. This design report outlines the design for the process evaluation, to address evaluation questions related to implementation fidelity; management; operations and maintenance; training, staffing, and support; budgeting and funding; and sustainability of the program. Necessarily, an important component of the process evaluation involves verifying outputs of the MP and UPUW Activity.

The rest of the report is structured as follows: Section 2 presents an overview of the Compact and the urban water interventions, including brief summaries of intended beneficiaries and geographic coverage, as well as the theory of change and economic model. Section 3 presents the evaluation design, including SI's methodological approach and data collection strategies for assessing implementation fidelity and answering other evaluation questions related to project implementation. Section 4 summarizes the data collection tools which are appended to this report as Attachments A, B, and C. Section 5 describes SI's proposed reporting and dissemination plans. Section 6 includes a proposed timeline for the process evaluation.

2 OVERVIEW OF COMPACT & INTERVENTIONS

MCC Lesotho Compact: The Millennium Challenge Corporation (MCC) entered into a Compact with the Government of Lesotho (GoL) between 2008 and 2013. This \$362.5 million Compact included activities in the water sector, the health sector, and private sector development. The Water Sector Project aimed to increase access to improved water supply and sanitation facilities for rural and urban communities, including domestic, commercial, and industrial users. Separate interventions were carried out for urban and rural areas.

Urban water interventions: The focus of SI's evaluation is limited to the investments in the urban water sector, including the Metolong Program (MP) and UPUW Activity. The MP sought to provide a long-term reliable water supply to lowland areas of Lesotho, and included a dam, water treatment works (WTW), low- and high-lift pump stations, and a downstream conveyance. MCC funded the Water Treatment Works (WTW), pump stations, and the Metolong Program Management Unit (MPMU). The UPUW Activity aimed to extend and rehabilitate the water network in urban and peri-urban areas. It included new and rehabilitated infrastructure, as well as provisions for new household connections. This evaluation will be conducted *ex post*, as implementation has been completed. A summary of the activities and outputs for the Metolong Program and UPUW Activity is provided in Table 1, with a map of project sites in Figure 1.

Beneficiaries and geographic coverage: Urban interventions were targeted primarily to urban areas in the lowlands of Lesotho, including the capital of Maseru and surrounding towns, as well as the majority of other urban areas around the country. Interventions were designed based on MCC's problem diagnostic that identified an acute shortage in bulk water supply to meet rising demand in rapidly growing urban areas; further, the potential expiration of AGOA threatened employment in the textile and garment industry in Lesotho, and increased water supply was envisioned as a means to attract additional foreign direct investment into the country for needed facilities, such as a fabric mill. Lastly, the reliability of supply was said to be worsening as network infrastructure continued to age, also affecting the utility's cost-recovery. Thus, the main anticipated beneficiaries of the urban water interventions included urban and peri-urban households (including previously unserved households as well as those experiencing unreliable supply through existing connections), textile and garment industry firms, and the utility (WASCO).

Theory of change and economic model: The theory of change asserted that increasing the amount of water in the system, upgrading infrastructure, and improving and extending the network would lead to increases in access/coverage, reliability, and quality, which would result in time savings and reduced diarrheal illness, ultimately increasing the time and resources available for generating income among households in urban Lesotho. MCC hypothesized that an increased supply of quality, reliable water would result in industry expansion and growth, ultimately leading to more employment opportunities and greater production. Increased coverage and reliability was expected to result in greater cost recovery for WASCO, which could then be allocated to maintaining the new infrastructure. The project logic is summarized in Figure 2.

Table 1. Summary of MCC Lesotho urban water interventions

ACTIVITY	COMPONENTS
Metolong Program	Construction of downstream water treatment works for the supply of water from the Metolong Dam to Maseru and the neighboring towns of Mazenod, Roma, Morija, and Teyateyaneng, and the establishment of the Metolong Program Management Unit (“MPMU”).
UPUW Activity	<p>Extension and rehabilitation of the urban and peri-urban water network.</p> <p><i>Package 1</i> – Maseru, Mazenod, Roma, Morija: rehabilitated reservoirs and pipelines; new reticulation, new household provisions, new public water points. Linked to MP. Final project also extended transmission to Teyateyaneng.</p> <p><i>Package 2</i> – Semonkong: Water Treatment Works; water intake, new mains; new reticulation, household provisions, public water points; new reservoirs.</p> <p><i>Package 3</i> – Mafeteng, Mohale’s Hoek, Quthing, Qacha’s Nek: Rehabilitate water treatment works; new water intake, mains; new reticulation, new household provisions, new public water points; new reservoirs; rehabilitated reservoirs, mains.</p> <p><i>Package 4</i> – Mokhotlong, Butha-Buthe, Leribe: Upgrade Water Treatment Works; New and rehabilitated water intake, new mains; New reticulation, new household provisions, new public water points; New reservoirs; Rehabilitated reservoirs, mains.</p> <p><i>Package 5</i> – Mapoteng: Chlorination and source and water tank; New water intake, main; new community draw-off points; new reservoir.</p>

Figure 1. Map of MCC Lesotho urban water interventions

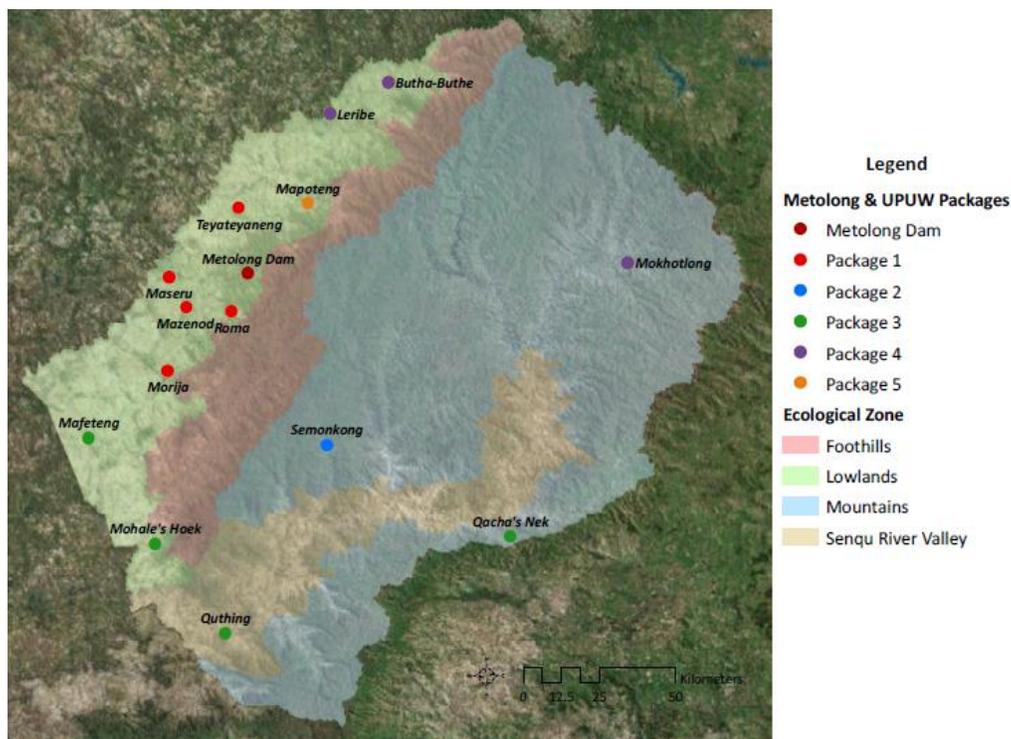
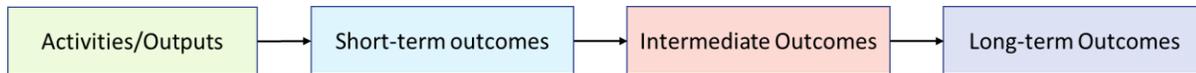
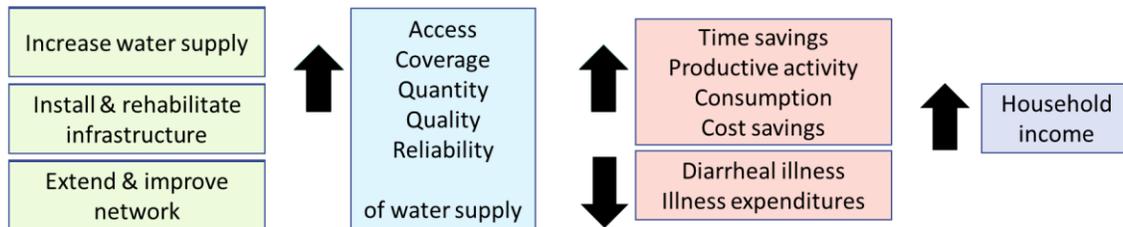


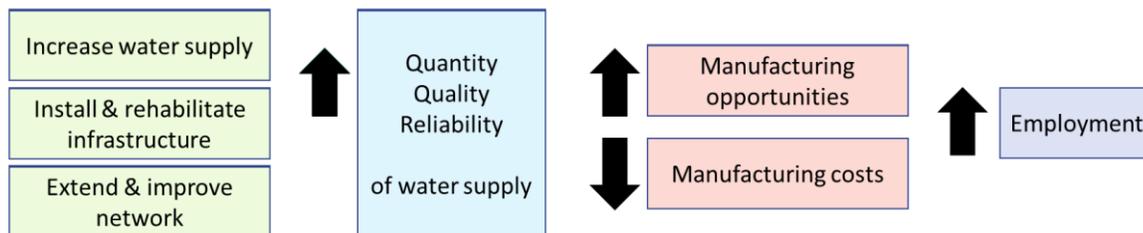
Figure 2. Theory of change for urban water interventions



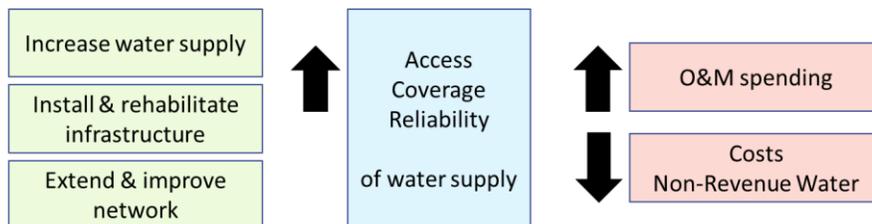
(a) Theory of change for impact of urban water interventions on **households**



(b) Theory of change for impact of urban water interventions on **industry**



(c) Theory of change for impact of urban water interventions on **utility**



3 EVALUATION DESIGN

3.1 Evaluation Questions

MCC provided eight questions in the evaluation scope of work focusing on issues primarily related to (a) project implementation, (b) impact on beneficiaries, (c) sustainability, and (d) lessons learned. The evaluation questions, with suggested refinements as proposed in SI's evaluability assessment, are listed below.

- 1) Is the program evaluable?
- 2) Was the program implemented according to plan? Are interventions operating according to plan? If not, what are the major issues, and to what extent were they affected by implementation fidelity?
- 3) What is the current functionality, use, and plan for managing and maintaining the infrastructure under the Metolong Program and UPUW Activity?
- 4) To what extent has a management unit been established for the Semonkong water system? To what extent has WASCO HQ provided support to those managing the new system in Semonkong?
- 5) To what extent has support been provided to the Water and Sewerage Company (WASCO) for the management of Metolong Dam, Water Treatment Works, and Pump Stations? If provided, who provided it, when was it provided, and how effective has this support and dam management been? Does a staffing plan exist for Metolong Dam? To what extent are positions occupied and what has turnover been to-date?
- 6) Do Operations and Maintenance plans exist for the Metolong Program and UPUW assets? How are these plans budgeted and funded? Are these O&M plans being observed and carried out?
- 7) What were program results on key short-term and intermediate outcomes?
 - a. To what extent has access to quality water increased? What activities, if any, has WASCO conducted to encourage households to connect to the network?
 - b. To what extent are community members (including businesses such as manufacturing firms) using water from the urban water network and how has this changed since the Lesotho Compact started?
 - c. To what extent are community members experiencing cost and time savings, or reductions in water-related illness?
 - d. How have the MP and UPUW programs impacted WASCO's income and costs? Has additional income been generated that can be directed to maintaining the new infrastructure?
- 8) What lessons can MCC or the Government of Lesotho apply to future programs related to program design, implementation, and sustaining results?

3.2 Evaluation Design Overview

3.2.1 Evaluability Assessment

SI conducted an evaluability assessment of the urban water interventions to establish an understanding of the way the project was designed, monitored, and implemented, in order to develop an appropriate *ex-post* evaluation methodology. This addresses **evaluation question 1**. Based on findings which showed that some Compact-funded infrastructure is not fully functional and may not yet have had the chance to deliver intended results to surrounding communities, SI recommended that a process evaluation be conducted to address project implementation and inform the design of IE activities.

3.2.2 Process Evaluation

The purpose of the process evaluation is to assess how the project was implemented and managed, report on current functionality and use, and derive lessons learned that can be applied to future Compacts. It includes two components: an **implementation fidelity assessment** and a **performance evaluation**. The process evaluation will include both the MP and the UPUW Activity.¹

3.2.2.1 Implementation Fidelity Assessment

The implementation fidelity assessment primarily addresses **evaluation questions 2, 3, and 6**. The purpose of the assessment is to determine whether the program was implemented according to plan, as well as document current functionality and use of the works, and where applicable, to assess where observed problems in functionality are originating. The results of the implementation fidelity assessment will inform decisions about evaluating household impacts. Recommendations can also be made based on the process evaluation for remedying any major problems.

EQ2) *Was the program implemented according to plan? Are interventions operating according to plan? If not, what are the major issues, and to what extent do they affect implementation fidelity?*

EQ3) *What is the current functionality, use, and plan for managing and maintaining the infrastructure under the Metolong Program and UPUW Activity?*

EQ6) *Do Operations and Maintenance plans exist for the Metolong Program and UPUW assets? How are these plans budgeted and funded? Are these O&M plans being observed and carried out?*

To answer these questions in full, we take a broad view of implementation fidelity, rather than a narrow focus on physical installation. We include important aspects of design, management, O&M, and funding that are collectively required to ensure that the infrastructure will carry out its intended function into the future.

Our overall methodological approach can be summarized as follows: SI will conduct **structured observations** at each project site, as well as **key informant interviews** with relevant stakeholders. Information from the site visits and key informant interviews will be used to develop **implementation fidelity scores** for each installation. To our knowledge, existing standards for assessing implementation fidelity of such projects using this broad definition have not been defined; our proposed method is described below.

¹ The implementation fidelity assessment will not include the Dam, while the performance evaluation does include one question pertaining to the Metolong Dam.

We will assess implementation fidelity based on the following four elements: **(i) Design, (ii) Installation, (iii) Management/O&M, and (iv) Funding.** Collectively, these elements account for the most important factors contributing to whether or not the infrastructure is fully functioning and achieving intended results. We will implement a unique scoring scale for each of the four elements, which will be summed to arrive at an overall fidelity index score. A single score allows comparison between different installations and types of infrastructure that might be quite different in nature. We have developed a draft of this scoring system, shown below in Table 2. As mentioned above, the fidelity scores will be based upon structured observations made at each project site, as well as information from key informant interviews where relevant. A justification for each score with supporting information, including photographs where applicable, will also be included in a narrative for each installation.

Site visit structured observation protocols will be filled for each site within each UPUW Activity as well as for the Metolong WTW and pump stations. Before beginning data collection, SI will populate design and function requirements for each installation based on a comprehensive review of design documents into the site visit observation protocols. This will enable the team to assess whether installations are fit for purpose and match or exceed design requirements, whether they are sustainable in an operating mode for the design life, and whether they are being operated and maintained by correctly and adequately trained staff with requisite spare parts readily available. While structured observations and scoring will be based on the professional judgment of the observer to compare requirements with actual implementation, in order to enforce a systematic assessment of fidelity to the greatest extent possible, SI has developed a set of standards described in the next sub-section for comparing designs to observation (3.2.2.1.1).

Note that in the majority of the smaller plants, the Compact paid for upgrading part of the plant. While the assessment will focus on the Compact segment, its function may be compromised by some upstream or downstream segment(s) which do(es) not function adequately. This may result in a scenario where there is a good score for the Compact segment, but a poor overall assessment of functionality as a whole. Where applicable, this will be documented clearly and corroborated with observation notes, photographs, and other evidence as needed.

Table 2. Implementation fidelity elements and scoring criteria

Fidelity element	Scoring Criteria
(i) Design	<p>2 = Designs suit the function requirements (or specifications) and local context; function requirements cover the right quantity at the right quality over the right period of time at the optimum cost.</p> <p>1 = Areas of poor design but the function requirements can be met with minor modifications or changes in operating procedures.</p> <p>0 = One or more parts of the design prevent the function requirements from being fully realized. (e.g., a plant that provided 60% of the required delivery would be scored “0” if the problem is with the design, rather than the operation)</p>
(ii) Installation	<p>4 = As envisaged.</p> <p>3 = Can be remedied with minimal time* and cost.</p> <p>2 = Can be remedied with moderate time and cost.</p> <p>1 = Remedy involves major time and cost.</p> <p>0 = Installation has failed altogether.</p>
(iii) Management / O&M	<p>2 = Both operations procedures and maintenance requirements are to standard (e.g. manuals available, log sheets printed and filed, operators trained to deal with situations out of the ordinary), O&M scheduled, schedule is posted in clear view, plant is clean and tidy.</p> <p>1 = Either O or M not to standard.</p> <p>0 = Both O&M are not to standard.</p>
(iv) Funding	<p>2 = Evidence of funding adequacy – sufficient staff**, tools, building maintenance and sufficient storage for chemicals, spares etc. and equipment is in good condition.</p> <p>1 = Evidence of funding constraints – short staffed (operator overloaded but managing, most important tasks being completed), buildings not maintained and storage etc. inadequate. Equipment not in good condition</p> <p>0 = Evidence of severe funding constraints – very short staffed (operator overloaded and workload unmanageable, some important tasks not being completed), equipment broken, buildings in disrepair.</p>
Fidelity index	<p><i>Scores will be weighted so that each element contributes equally to index:</i></p> <p>(i) * 1.3333333 + (ii) * 0.5 + (iii) * 1.3333333 + (iv) * 1.3333333 = Range 0-10</p>

Note: Score criteria refer to on-site observation; further input to score can be obtained through KIIs.

*We suggest the following parameters: minimal time: 1 week of repair crew of 2 men with a total cost of less than 4 time repair crew cost (total = 40 man days); moderate time: 2 weeks of repair crew of 4 men with a cost of less than 6 time repair crew cost (total = 240 man days); major time: upwards of above - 4 weeks of repair crew of 8 men with a cost of less than 8 time repair crew cost (1280 man days).

**Sufficient staffing: If the plant is to operate for more than 8 hours per day, there must be a full shift for each 8 hours. The shift should include at least the operator/process controller and one assistant plus at least one more laborer for the day shift. Less staffing than this, and the operators can be overloaded, and the requirements cannot be fulfilled.

3.2.2.1.1 Standards for assessing implementation fidelity for design, installation and operations

DESIGN AND INSTALLATION

The following criteria can be used to assess the various types of infrastructure, as far as the design approach and whether installation occurred according to design:

River Abstraction: *As stated* – target abstraction flow rate and daily volume to be abstracted; how the inflow sediment load is to be settled or screened out; where inflow is pumped, the number of raw water pumps, maximum to operate at one time and number to be on stand-by; intake desilting pump(s) type, number and required delivery. Pump power demand, optimum motor sizing and installed motor size to be stated. Manual and/or automatic operation. Corrosion protection and materials used for pipes, screens etc. Any secondary function installations.

Raw Water Pipeline: *As stated* – corrosion protection to be well designed and applied, size to be compatible with design flows and head losses. Flow meter, instantaneous and totaling, with remote read out. Secondary items to be incorporated, such as check valves, scour valves and air release /air ingress valves.

Water Treatment Works: *As stated* – Throughput per day, type and number of sedimentation tanks / filters/filter beds and combined design flows to indicate spare capacity to accommodate backwashing and maintenance. All connecting pipe works, backwash arrangements (automatic or manual), air blowers, chemical dosing systems (including chlorination/sterilization); filter sludge ponds and dried sludge disposal.

Water quality delivered by Water Treatment Works to clear water reservoir, pump station or reticulation, after any clarification treatment: *As stated or Presumed* to be to SANS 241; Parts 1 & 2 (as included in the O&M Manual). This must include chlorination of final treated water.

Pump Station: *As stated* – the target delivery flow at target pressure. The maximum number of pumps to be operating at a time, number of standby pumps; pump power demand, optimum motor sizing and installed motor size. Manual and/or automatic operation. Any secondary function installations. Corrosion protection; pump(s) and pipe(s) layout for optimum pump operation (avoiding internal vortices and potential cavitation).

Electrical Control Panels: *As stated* – but should include for operating and isolating all individual units (pumps / mixers / dosing units / etc.; should include ammeters for all units over 5kW power rating, voltmeters per phase, Run / On lights.

Remote Sensing Automatic Operation / Manual Operation: *As stated.* – Operating algorithms to be fully described, manual operations to be available on demand.

Standby Generating Sets: *As stated* – must be capable of generating demand for all operating equipment in the Treatment Works or pump station needed to deliver the design throughput. If not, the limitation must be clearly stated in notices throughout the Treatment Works or at the Motor Control Panel in the Pump Station. Fuel storage to be sufficient for a minimum of 24 hours operation at full load, unless otherwise stated in the Function Specification.

Rising Main Pipeline: *As stated* – corrosion protection to be well designed and applied, size to be compatible with design flows and head losses. Flow meter – instantaneous and totaling, with remote readout for larger stations. Secondary items to be incorporated, such as check valves, scour valves and air release / air ingress valves.

Reservoir: *As stated* – Should be roofed and ventilated and have a transmitting electronic level sensor as well as a physical level indicator, which should be visible and legible from a distance. All outlets to have isolating valves and overflow capacity must be to suit maximum inflows.

OPERATION BY ADEQUATELY TRAINED STAFF

Operators' records, which should be available on site, should show the following:

Pump stations: Automatic or Manual Mode: Automatic digital or manual logging at start and end of day/shift (08:00 / 16:00) of instantaneous flow and totaled delivery. Log times of switch on / switch off (manual) and observed automatic times. Log flow, pressure, ammeter readings during pumping and pressure during no pumping period. If reservoir(s) level(s) is (are) available, log these at start and end of day / shift. Note any unexpected or unusual events or problems, such as power outages, emergency generator use, and to whom reported. Log any maintenance or repair work carried out by anybody.

Intake Works: Apart from the above, note times of running desilting pump(s).

Water Treatment Works: Log all tests, inspection activities and changes made to processes. Test raw water and finished water quality daily if constant – more often if changing. Log all indices. Check flocculation dosing effectiveness. Note filter bed head losses. Schedule backwashing.

3.2.2.2 Performance Evaluation

The second component of the process evaluation will focus on other aspects of project performance and implementation. The design for this component follows what is typically defined as a performance evaluation.² This part of the process evaluation will address **evaluation questions 4, 5, and 7d** through a combination of document review, site visits, and key informant interviews. Evaluation question 8, relating to overall lessons learned, would be addressed by synthesizing all results at the conclusion of the evaluation. To the extent that findings from the process evaluation are relevant, we will include preliminary answers to evaluation question 8 based on the process evaluation in reporting documents produced as part of the process evaluation.

EQ4) *To what extent has a management unit been established for the Semonkong water system? To what extent has WASCO HQ provided support to those managing the new system in Semonkong?*

SI will verify the presence of a management unit for the Semonkong water system through key informant interviews and a site visit to Semonkong. Key informant interviews with WASCO staff and senior operators will also provide information on its roles and responsibilities, turnover, available resources, and support from WASCO. If it has been established, KIIs will also include a member of this unit. SI will determine the extent to which the management unit has been properly resourced to carry out its responsibilities, and probe for any specific successes and challenges faced to date. If the unit has not been established, SI will determine whether any alternative management system is in place, or otherwise how certain processes/functions are being performed in the absence of any management unit.

EQ5) *To what extent has support been provided to the Water and Sewerage Company (WASCO) for the management of Metolong Dam, Water Treatment Works, and Pump Stations? If provided, who provided it, when was it provided, and how effective has this support and dam management been? Does a staffing plan exist for Metolong Dam? To what extent are positions occupied and what has turnover been to-date?*

Key informant interviews will be essential to characterizing the support offered to WASCO for the management of the Metolong Dam from the perspective of those providing and receiving support, including stakeholders from WASCO, the MA and MPMU, staff from the Metolong WTW, and potentially other implementing entities and development partners. SI has been informed of the probable involvement of the Lesotho Highlands Development Authority (LHDA) in the monitoring of dam safety issues but understood this was yet to be formalized. Site visits at the Dam³, WTW, and pump stations will assist the team in addressing the question about staffing plans, vacancies, and turn-over through review of administrative records, and may also assist the team in verifying some of the support or training measures reported in the KIIs. As envisioned, the KIIs would precede site visits, but SI may need to schedule brief follow-up meetings with key informants to verify particular issues or observations.

The team will also verify the support/trainings provided through administrative records from WASCO HQ, as feasible. Requirements and norms for training standards in Lesotho must be determined through KIIs in order to assess the relevance and effectiveness of such training. Assessing support provided would also include

² According to MCC M&E Policy, a performance evaluation is a study that seeks to answer descriptive questions, such as: what were the objectives of a particular project or program, what the project or program has achieved; how it has been implemented; how it is received and valued; whether expected results are occurring and are sustainable; and other questions that are pertinent to program design, management and operational decision making.

³ Note that the Metolong Dam will not be visited as part of the implementation fidelity assessment but may be visited in order to conduct physical verification for the performance evaluation component of this study.

ascertaining the availability of back-up operators, and routine support provided by Area Managers on-site, though a combination of KIIs, administrative records, and site visits.

EQ7d) How have the MP and UPUW programs impacted WASCO's income and costs? Has additional income been generated that can be directed to maintaining the new infrastructure?

SI will conduct KIIs with the Operations, Engineering, and Finance Sections of WASCO to address this question. The unit cost of water delivered from the MP should be much the same for partial or full design throughput, since capital cost is not considered.⁴ Similarly, extensions of the delivery systems under the Compact should improve income without the usual associated amortization costs.⁵ However, WASCO appears to be in financial difficulties despite these additional sources of revenue. SI must obtain information to determine why the perceived opinion within WASCO management is that the MP and UPUW programs have caused additional losses.

3.3 Data Collection

Implementation Fidelity: As discussed in the sections above, information gathered through structured site observation protocols and a comprehensive review of design documents and completion reports will serve as the basis for implementation fidelity scores and responses to evaluation questions 2, 3, and 6. KIIs will also inform the scores where applicable. KIIs with WASCO HQ staff, WASCO site operators (including Metolong operators), MCA-Lesotho design consultants, staff from MPMU, and the UPUW PIU (as feasible) will also capture perceptions and reactions to the way the programs have been implemented and maintained, as well as how the Compact activities were managed.

Performance Evaluation: Key informant interviews with WASCO and operators at relevant sites will be the primary source of information for responding to evaluations questions 4, 5, and 7d. Where applicable, physical verification regarding the presence of specific documents on-site will also assist the team in addressing these questions. Lastly, project documentation and administrative records available in-country at WASCO and at relevant project sites will also inform responses to these evaluation questions.

Duplicate site visits will not be conducted; information from site visits and KIIs relevant to either component will be gathered concurrently during a single visit/interview. See Table 3 below for a summary of the data source for each evaluation question in the process evaluation. Following this, a list of site visits and preliminary list of key informants are provided. Draft tools are included as Attachments A, B, C and include the following:

Attachment A) Site Visit Structured Observation Protocol

Attachment B) Fidelity Scorecard Template

Attachment C) Key Informant Interview Guides

⁴ Chemical and pumping costs are related to throughput, WTW staffing costs are essentially fixed, so we expect lower unit cost for higher production. Losses should be fixed per reticulation and rising main, except for increasing non-revenue water taken from stand-pipes.

⁵ Increased sales should decrease the proportion of non-revenue water unless the reticulation pipelines are poorly constructed and losses are high.

Table 3. Data collection by evaluation question

Evaluation Question	Key Outcomes	Data source	Data type
EQ1: Evaluability	n/a	Desk review of due diligence, feasibility, and M&E documents, Scoping trip interviews and preliminary site visits	Quantitative as available in relevant documentation; qualitative interviews
EQ2: Implementation Fidelity EQ3: Functionality, use, management, maintenance EQ4: Semonkong management unit EQ5: WASCO HQ support for Metolong EQ6: O&M plans for Metolong and UPUW	n/a - Verification of key activities and outputs	Desk review: design and completion reports, as-built drawings and other relevant project documentation + Administrative records from WASCO and sites + Site Visit Structured Observations + Key Informant Interviews	Desk review – design and function requirements and as-built information Quantitative and qualitative information from administrative records Site Visits – Structured Observation Form + Qualitative Notes KIIs – Qualitative
EQ7a-c: Impacts on households and industry	<i>7a-7c: Water use & consumption; Time savings; Diarrheal illness (prevalence & expenditures); Productive activity</i>	<i>7a-7c: TBD</i>	<i>7a-7c: TBD</i>
EQ7d: WASCO Cost recovery	7d: WASCO Utility Costs; Spending on O&M	7d: WASCO financial records & key informant interviews	Quantitative as available in relevant documentation; qualitative interviews
EQ8: Lessons to apply to future programs	n/a	<i>Synthesis</i>	<i>All above</i>

Table 4. Project documents to be reviewed for process evaluation

Author	Document
UPUW Activity	
PDNA International	Final Design Report: Package 1: Maseru and Mazenod: Vol. 1
PDNA International	Final Design Report: Package 2: Semonkong Phase 1: Vol. 1
PDNA International	Final Design Report: Package 2: Semonkong Phase 1: Vol. 2
PDNA International	Final Design Report: Package 2: Semonkong Phase 1: Vol. 3 part 1
PDNA International	Final Design Report: Package 2: Semonkong Phase 1: Vol. 3 part 2
PDNA International	Final Design Report: Package 2: Semonkong Phase 1: Vol. 3 part 3
PDNA International	Final Design Report: Package 3 - Vol. 1
PDNA International	Final Design Report: Package 3: Mafeteng, Mohale's Hoek, Quthing, Qachas Nek: Vol. 2
PDNA International	Final Design Report: Package 3: Mafeteng, Mohale's Hoek, Quthing, Qachas Nek: Vol. 3 (Part 1)
PDNA International	Final Design Report: Package 3: Mafeteng, Mohale's Hoek, Quthing, Qachas Nek: Vol. 3 (Part 2)
PDNA International	Final Design Report: Package 4
PDNA International	Final Design Report: Package 5
PDNA International	Final Completion Report: End of Assignment for Base Packages
PDNA International	Project Completion Report: Package 1 (Part 1)
PDNA International	Project Completion Report: Package 1 (Part 2)
PDNA International	Project Completion Report: Package 1 (Part 3)
PDNA International	Project Completion Report: Package 2
PDNA International	Project Completion Report: Package 3
PDNA International	Project Completion Report: Package 4 (Part 1)
PDNA International	Project Completion Report: Package 4 (Part 2)
PDNA International	Project Completion Report: Package 4 (Part 3)
PDNA International	Project Completion Report: Package 4 (Part 4)
PDNA International	Project Completion Report: Package 4 (Part 5)
PDNA International	Project Completion Report: Package 5
PDNA International	UPUW Consolidated Design Report (Part 1)
PDNA International	UPUW Consolidated Design Report (Part 2)
PDNA International	UPUW Consolidated Design Report (Part 3)
PDNA International	Monthly Report 23 for Optional Package 5
Jeffares & Green	Design Review for the UPUW Project-Preliminary Findings Report (Part 1)
Jeffares & Green	Design Review for the UPUW Project-Preliminary Findings Report (Part 2)
GIBB	UPUW Assessment of EHS Performance
GIBB	UPUW Task 2.1 (EHS Program) Monthly Report 5
Consulting Engineers Salzgitter	Technical Assistance to WASCO-PMU Progress Report 5
Consulting Engineers Salzgitter	Technical Assistance to WASCO-PMU Progress Report 6
TBD	Environmental and Social Impact Assessments (ESIAs) for UPUW
Metolong Program	

Author	Document
CDM International	MPMU Final Inception Report
CDM Smith	MPMU Monthly Report 41
CDM Smith	MPMU Monthly Report 49
CDM Smith	MPMU Monthly Report 54
GIBB/Consolidated Consultants	Metolong Dam Project Phase II Monthly Progress Report - Site Supervision
CMC/Botjheng JV	Metolong WTW Monthly Report Nov. 2012
CMC/LogiProc	Metolong WTW- Monthly Operation Summary- Aug. 2016
CMC/LogiProc	Metolong WTW- Monthly Operation Summary- Jul. 2016
Unik Construction	Metolong Dam Downstream Conveyance Monthly Progress Report 2
Unik Construction	Metolong Dam Downstream Conveyance Monthly Progress Report 5
Unik Construction	Metolong Dam Downstream Conveyance Monthly Progress Report 13
TBD	Environmental and Social Impact Assessments (ESIAs) for Metolong
Overall	
Jimat/DRN	End of Program Review Vol. 1: Overall Program
Jimat/DRN	End of Program Review Vol. 2: Water and Sanitation Sector

3.3.1 Site Visits

The following sites will be visited for data collection, where structured observation and KIIs will take place.

1. Metolong Dam low-lift pump stations
2. Metolong WTW & high-lift pump stations
3. UPUW Package 1: Maseru, Mazenod, Roma, Morija⁶ (reservoirs and pump stations)
4. UPUW Package 1: Teyateyaneng (pump stations)
5. UPUW Package 2: Semonkong
6. UPUW Package 3: Quthing
7. UPUW Package 3: Qacha's Nek
8. UPUW Package 3: Mohale's Hoek
9. UPUW Package 3: Mafeteng
10. UPUW Package 4: Mokhotlong
11. UPUW Package 4: Leribe
12. UPUW Package 4: Butha-Buthe
13. UPUW Package 5: Mapoteng

3.3.2 Key Informants

SI will consult with all key stakeholders with insight or responsibility for aspects of the Metolong and UPUW interventions that relate to the topics and evaluation questions addressed by this process evaluation. This includes stakeholders responsible for operation and maintenance of the interventions, training and support for

⁶We did not visit Package 1 installations during the scoping trip because there is very little that can be seen – reservoirs and pump stations can be visited.

operators and other relevant personnel, management of construction and oversight, and those responsible for funding and ensuring sustainability of the interventions. Key informants will also include individuals with knowledge of various relevant topics including technical issues around the implementation and maintenance of infrastructure works, environmental issues, wastewater treatment issues, water quality, financial and sustainability issues, and other related topics. SI will also interview stakeholders whose expertise was accessed during the Compact for specific purposes, e.g. independent design reviews. Some key informant interviews will take place remotely, and SI will conduct these remote interviews based on when their input will be most relevant and useful, relative to the timing of the data collection trip in Lesotho.

3.3.2.1 Analysis of Key Informant Data

SI does not intend to record interviews as we anticipate in this case that this may affect the respondents' willingness to share freely during interviews. SI will take detailed notes during interviews and will transcribe them in full following the interviews. The notes will be categorized as appropriate by the relevant part of each evaluation question to which they pertain. We will analyze and report on the information shared by key informants as relevant for each evaluation question, interpreting responses in the context of information available through project documentation, project monitoring information, direct observation during site visits, and other key informants.

As the interviews will be conducted with a relatively small number of key informants, selected because of their specific experiences, roles, and expertise, SI will not conduct thematic analyses across all interviews (in some cases a very limited number of individuals are able to weigh in on given questions), and thus a standard codebook for analysis will not be relevant in this case, other than to categorize notes by the relevant evaluation question. KII notes will serve to directly address evaluation questions, supplementing structured observation data.

3.4 Challenges & Limitations

Implementation fidelity scores can be most confidently assigned in cases where it is abundantly clear what was expected. To the extent that documents are not available or otherwise do not adequately demonstrate specifications or expectations, scores will be based partially on what the team can infer about expectations. We must acknowledge a degree of subjectivity on elements that will not have objective criteria upon which to make scoring decisions. Likewise, some infrastructure cannot be physically observed, such as reticulation. Project documentation including completion reports and as-built drawings must be relied upon in such cases, as well as key informant interviews.

In addition, the scoring system has been devised for the purposes of this evaluation. Thus, the score is not an inherently meaningful measure of the level or percent of implementation fidelity outside of this study. It is meant as an aid that can be used in order to demonstrate results relative to expectations, and in some cases, may be helpful to compare the relative success of different components.

There is also a possibility that required administrative documents are not made available to the SI team. We will attempt to mitigate this risk by submitting a request for documents to WASCO ahead of the in-country data collection, through the appropriate channels, to provide ample notice and justification for such requests, and will follow up again in person as applicable for any pending documents. In addition, SI could draw upon its local consultants to follow up in-person as needed between the initial request and the trip, as well as after the trip, if needed. To the extent that information is not made available or that WASCO is not willing to allow SI

access to certain documentation, SI's ability to address certain evaluation questions would be limited to what can be gathered through other means (KIIs, direct observation).

To mitigate any potential resistance and foster buy-in for the evaluation, SI will discuss with all relevant stakeholders that the purpose of the evaluation is to advise MCC on ways to improve upon future activities based on the Lesotho WSP experience, and in the process to possibly suggest how to improve the management and sustainability of these activities. SI will emphasize that we are not looking to disclose inadequate management but need the information to compile the evaluation results, which can facilitate better planning and organization of future Compacts.

3.5 Data & Informational Needs

3.5.1 Project Documentation & Relevant Contacts

At the time of submission, requests to LMDA for the following information are pending:

- Package 3 Volume 1 Design Document (SI has volumes 2 and 3)
- Package 4 and 5 design documents
- Higher quality diagrams included in all design documents
- GIBB review of designs
- Package 2, 3, and 5 extensive completion reports including all annexes and as-built drawings
- As-built drawings for all packages
- Correspondence from PDNA addressing questions from WASCO on design & operation queries

The following will be requested as well from LMDA or MCC:

- Environmental and Social Impact Assessments (ESIA) pertaining to these interventions

3.5.2 Documentation Request to WASCO

Following the approval of this report, SI will submit a request to WASCO for the following documentation, prior to in-country data collection. A specific list will be drafted for the formal request. In some cases, directly observing these documents in-country will also be part of the process evaluation (e.g. observing whether maintenance schedules are clearly posted on-site).

Metolong WTW

1. Funding / budgeting details
2. Full WASCO organogram for staffing / oversight / top management
3. O&M manuals which should include: Operating routines and instructions, Planned Maintenance schedules, Emergency Preparedness Plans
4. Consumables / Spares requirements and essential spares lists

UPUW Activity: Information available to the SI evaluation team is largely lacking to date on budgets and funding, maintenance and emergency plans, staffing and head office support, and suitable operation and maintenance manuals and operators' records. All reports and manuals can be requested ahead of in-country data collection work, while the site visits will furnish information from KIIs with operating staff, regarding O&M, operational problems and approaches to potential remediation action, where necessary.

4 INSTRUMENTS

4.1 Site Visit Structured Observation Protocol

See Attachments A and B for the site visit structured observation protocol and the implementation fidelity scorecard template. Site visit observation protocols will be filled in for each site within each UPUW package.

As it may be more feasible to fill in the structured observation protocols in hard copy, a final version of the site observation protocol will be digitized, and will include fields to log the date visited, the individuals present and providing information, and will include references to relevant project documents, and/or photographs. In addition, notes taken during the site visits will be transcribed in soft copy and submitted to MCC. Relevant information from these notes will be included in the notes section of the fidelity scorecard.

4.2 Key Informant Interviews

SI will conduct key informant interviews with relevant stakeholders to gather information relevant for the process evaluation, including the implementation fidelity assessment as well as the performance evaluation components. In order to reduce the burden on respondents, who may have valuable insights for both components of the process evaluation, interviews will cover a range of topics related to evaluation questions 2 through 6 and 7d.

5 REPORTING & DISSEMINATION

SI will prepare a **trip report** from the process evaluation in-country data collection mission, summarizing activities, sites visited, and individuals interviewed.

A stand-alone, formal report is not envisioned for the process evaluation; findings will be folded into the final evaluation report. SI will hold a **preliminary findings presentation** from the process evaluation at MCC's convenience. In addition, SI will prepare a **written assessment of each problematic installation** that does not appear to be up to its design requirements or for which the design has proved inappropriate or the installation should be modified, or remedial work done, given that this information may be time sensitive relative to the point at which the final evaluation report would be prepared. This assessment would provide analysis on the gap between expected and realized outcomes in terms of design, functionality, etc.

SI's technical proposal included a StoryMap deliverable. This is an interactive, web-based map tool that can be used to show maps, photographs, and written findings and data together in a user-friendly format. SI envisions that a final version of the StoryMap will be produced as a final deliverable in the evaluation, including the results of any impact evaluation activities undertaken. Development of this deliverable can begin after the completion of data collection.

6 ADMINISTRATIVE

In this section we summarize our plans for carrying out required administrative tasks to implement the evaluation.

6.1 IRB Requirements & Data Protection and Publication

IRB requirements: SI has an in-house Institutional Review Board (IRB) that can review applications for human subjects research. Although the kind of data collection activities described in this document do not meet the requirements for submission to the IRB as human subjects research,⁷ SI submitted the study protocol for IRB review and received expedited review and approval for this component of the evaluation. With regards to posting qualitative data from the process evaluation, we note MCC's stated objective⁸ to obtain from evaluators, where possible, raw qualitative data for the purposes of providing this either publicly or through restricted-access for use by other researchers at some future date. However, in this process evaluation, only a limited number of individuals can be expected to comment substantively on a specific topic or on specific evaluation questions and interview guides necessarily differ by respondent. In many cases the content of the responses could serve to re-identify a respondent even where direct identifiers were removed. Given the balance of risks and benefits, key informants will be assured that names and job titles will not appear in any reporting and, further, raw qualitative data will not be provided to MCC or posted publicly.

Respondent Protection: To protect the privacy and confidentiality of key informant interviews, the SI team will ensure that interviews take place in a reasonably private location where key informants are comfortable responding openly. An informed consent form will be administered to all key informants prior to the start of the interview, to ensure respondents understand SI's independent role in the evaluation, the voluntary nature of the interview, and their right to refuse to answer specific questions and/or to stop the interview early. Respondents will also be informed in this consent form that their names and job titles will not be referenced in any reporting, and quotes that would serve to re-identify them will not be used in reporting. Further, to ensure respondent comfort during interviews, interviews will not be audio recorded. SI will take detailed notes and will transcribe these notes in full, electronically, following the interviews. After reporting and dissemination is complete, SI will dispose of hand-written notes which include any names, job titles, or contact information. Transcribed interview notes will be saved in project folders which are accessible only by project team members.

⁷ Defined by the US Department of Health and Human Services (HHS) Office for Human Research Protections (OHRP) in 45 CFR 46.102, as **research** ("a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge") that involves **human subjects** ("a living individual about whom an investigator (whether professional or student) conducting research obtains data through intervention or interaction with the individual, or identifiable private information"). This definition generally would not include activities undertaken with the principle objectives of operational or program improvement or assessment, such as: mid-term program evaluations, fiscal or program audits, literature reviews, meta-evaluation analyses, or data collection for other purposes, unless they involve potentially significant risks to subjects or work with highly vulnerable populations (e.g. minors). However, the SI IRB will require review if program evaluation research involves vulnerable people (e.g. children, prisoners, mentally disabled, socially marginalized groups, illegal workers, people in a highly oppressive political regime or conflict area), or if data collection procedures, data submission to client, or accidental disclosure of data to certain people might pose risks of negative social, economic, political, physical or other negative ramifications.

⁸ MCC Evaluation Microdata Documentation and De-Identification Guidelines January 2017 p. 9, and comments received on draft Process EDR.

6.2 Evaluation Team & Timeline

6.2.1 Evaluation Team Roles and Responsibilities

The SI evaluation team will distribute responsibilities for the process evaluation as follows:

Program Manager/Sr. Analyst-Evaluation Expert (Danae Roumis – SI HQ): Oversee compliance with methodology, timeline, and deliverable schedule for process evaluation. Contribute to methodology, analysis, and preparation of written deliverables. Participate in DC-based dissemination.

Sr. Analyst-Water Supply Expert (Robin Clanahan): Primarily responsible for data collection and analysis for process evaluation; prepare trip report and produce draft deliverables for MCC. Lead findings presentations.

Junior Analyst (Masike Ramasike): Participate in Lesotho-based data collection, coordinate site visits, and liaise with in-country stakeholders. Contribute and participate as requested to written deliverables and in Lesotho-based dissemination efforts.

Sr. Analyst-M&E Advisor (Basab Dasgupta – SI HQ): Contribute technical feedback on methodology for data collection and analysis; review written deliverables for quality assurance purposes.

Junior Analyst (Miguel Albornoz – SI HQ): Manage contract, work plan, and budget compliance; liaise with consultants and provide technical research assistance as requested by Program Manager.

Administrative Assistant (Andrea Hur – SI HQ): Administrative functions; provide technical research assistance as requested by Program Manager and Junior Analyst.

6.2.2 Evaluation Timeline and Reporting Schedule

Immediately upon approval of the methodology, SI would begin desk review and submit document requests to WASCO. We propose a trip for data collection for up to three weeks (two weeks for data collection, plus buffer time for follow up meetings after site visits), to be planned following MCC approval but tentatively anticipated to start in late May. SI aims to deliver the preliminary findings presentation to MCC within six weeks after the end of data collection. If approved, local dissemination would be scheduled at a later date.

7 REFERENCES

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ANNEX: STAKEHOLDER COMMENTS

The following comments were received from MCC M&E, Economic Analysis, and other teams reviewing the EDR:

In reference to	Comment	Evaluator Response
Evaluation Question 2: Was the program implemented according to plan? Are interventions operating according to plan? If not, what are the major issues, and to what extent do they affect implementation fidelity?	I'm not sure I follow how problems with current operations can "affect" implementation fidelity. Perhaps they could have been affected by implementation fidelity?	For clarity, the wording of the question was revised to reflect MCC's comment: "If not, what are the major issues, and to what extent were they affected by implementation fidelity?"
Evaluation Question 5: To what extent has support been provided to the Water and Sewerage Company (WASCO) for the management of Metolong Dam, Water Treatment Works, and Pump Stations? If provided, who provided it, when was it provided, and how effective has this support and dam management been? Does a staffing plan exist for Metolong Dam? To what extent are positions occupied and what has turnover been to-date?	<p>1: Is there a management plan for the Dam? Does it include monitoring of water quality (e.g. identify potential disease vectors and/or increase costs of treatment)? Is the measurements of water quantity? If the watershed around the dam is not protected, sediments could be filling in the dam and undermine the depth/quantity of water as well as increase turbidity and nutrient loads in the water (e.g. increase filtration and treatment costs).</p> <p>2: In general, ESP is interested in assessing the extent to which key plans are in place, being implemented and resourced appropriately. This seems to be a fair aspect of O&M. Please see questions in Attachment C and refine as needed and consider who else should be asked these questions.</p>	Assessing whether there is a management plan in place for the Dam, and whether water quality and quantity are being monitored regularly/properly there is within scope of the process evaluation with regard to O&M of the Metolong Dam. SI will include this in the data collection effort as part of the site visit to Metolong Dam and WASCO KIIs. See also Attachment C responses.
Evaluation Question 7a: To what extent has access to quality water increased?	<p>1: If there is sedimentation in the dam, what are the projections for quantities of water without active sediment removal? It speaks to the operational life of the dam and the water supply.</p> <p>2: SI: I don't think we need to add this as an evaluation question but can "explore" as a part of O&M. See how I propose to address in Attachment C.</p>	Agreed. As part of the data collection effort, through the site visit to Metolong Dam and WASCO KIIs, SI will obtain information on whether Dam management is projecting quantities of water without active sediment removal. See also Attachment C responses.

<p>Evaluation Question 8: What lessons can MCC or the Government of Lesotho apply to future programs related to program design, implementation, and sustaining results?</p>	<p>4: As part of this it would be helpful to review impacts associated with waste water. This is particularly important for WASCO Package 2 in Semongkong, where our program introduced piped water where it had not previously existed without any plan for wastewater treatment. Households were supposed to construct soakaways before water connections could be done, but we do not know if this is actually happening in practice (and if it is, whether or not this is proving effective/sufficient)</p> <p>1: Echoing 4's point, was the water managed in an integrated fashion for protecting the source whether it is watershed or supported by aquifers through use and discharge back into the environment. It looks like insufficient attention was paid to discharge which could contaminate water tables below the water use points. Indirectly, this could lead to increased disease vectors such as diarrhea, which was supposed to be reduced by this program – not increased. It may explain extraneous results if you still have high levels of diarrhea being report. It would be good to find out spatial where the diarrhea cases to see if waste water treatment is a concern.</p> <p>2: ESP makes the point that WASCO committed to take care of this issue, which presents a risk to any health-related results. Can we explore this in the interviews with WASCO staff and discussions with site managers?</p>	<p>Agreed that the need for wastewater treatment is important in all areas covered by the packages. Yes, SI will follow up during KIIs with WASCO HQ staff and site managers (regional, area, and site operators) - with special attention to Semonkong as noted by commenters - regarding wastewater management/integrated water management. See also Attachment C for addition of related questions into KII guides.</p>
<p>In Evaluability Assessment Section 4.5.3, in response to SI's suggestion to add the following to evaluation question 4: "To what extent has WASCO HQ provided support to those managing the new system in Semonkong?"</p>	<p>Great. We also would like to assess whether WASCO has done anything to encourage HHs to connect to the network.</p>	<p>As this question pertains specifically to the management of the Semonkong system, we propose adding a question as part of question 7 to explore whether WASCO has conducted any activities to encourage households to connect to the network, related to the topic of whether access to quality water has increased. SI has added the following to evaluation question 7a: "What activities, if any, has WASCO conducted to encourage households to connect to the network?"</p>

<p>To answer these questions in full, we take a broad view of implementation fidelity, rather than a narrow focus on physical installation. We include important aspects of design, management, O&M, and funding that are collectively required to ensure that the infrastructure will carry out its intended function into the future.</p>	<p>1: This can also include maintenance of the watershed around the Dam, so that sediment loads do not fill the reservoir. Unless the government or utility owns the land, they may not control land use. Loss of reservoir will reduce water availability in a short period of time. In the network, lack of O&M will lead to technical losses and contamination of the water quality over time. This could undermine the indicator of reducing diarrhea, for example.</p> <p>2: SI: this is related to the sediment comment above. Please see additions in Attachment C.</p>	<p>See response above and Attachment C.</p>
<p>Our overall methodological approach can be summarized as follows: SI will conduct structured observations at each project site, as well as key informant interviews with relevant stakeholders.</p>	<p>Can you document somewhere whether SI will just take handwritten notes or whether you'll record the interviews as well, and also how you plan to process and analyze the data? For instance, are you planning to type it all up and use software to code it, etc. or are you planning to do something less formal?</p>	<p>SI does not intend to record interviews as we anticipate in this case that this may affect the respondents' willingness to share freely during interviews. SI will take detailed notes during interviews and will transcribe them in full following the interviews. The notes will be categorized as appropriate by the relevant part of each evaluation question to which they pertain. We will report on the information shared by key informants as relevant for each evaluation question, interpreting responses in the context of information available through project documentation, project monitoring information, direct observation during site visits, and other key informants. As the interviews will be conducted with a relatively small number of key informants, selected because of their specific experiences, roles, and expertise, we are not conducting thematic analyses across all interviews (in some cases a very limited number of individuals are able to weigh in on given questions), and thus a standard codebook for analysis will not be relevant in this case, other than to categorize notes by the relevant evaluation question. All notes will serve to directly address evaluation questions, supplementing structured observation data. This is now documented in the body of the text in a new sub-section 3.3.2.1.</p>
<p>Table 2, Fidelity element (i) Design, score of 2: 2 = Designs suit the function requirements (or specifications) and local context; function requirements cover the right quantity at the right quality over the right period of time at the optimum cost.</p>	<p>3: Should there be another score (maybe 1.5) for infra that met the project specifications but whose functionality is compromised by upstream or downstream issues (as described I preceding paragraph)? Even if a different score is not attached, SI should describe this aspect of functionality in their scoring summary. It's a really</p>	<p>We consider this as an installation problem rather than a design problem, unless the malfunctioning element should have been included in the package and redesigned (in which case it would factor into the score). SI proposes leaving the scores, though as an important aspect of the overall functionality of the infrastructure, any such cases will be</p>

	<p>important point that they've raised! <u>2:</u> This is a good point. I just don't know whether it's a design issue or an O&M issue. SI, how do you propose capturing 3's point?</p>	<p>documented in the narrative summary accompanying this scoring element.</p>
<p>Section 3.2.2.1.1 Standards for assessing implementation fidelity</p>	<p>In order to determine whether or not designs were appropriate, it will be important for the Consultant to review the Final Design Reports for each of the Urban-Peri-Urban Water Projects. These reports include the project Design Standards and Guidelines, Design Criteria and Assumptions, Geotechnical Conditions, Final Design Components, Engineer's Cost Estimate, Project Implementation requirements and Work Program. Project Completion Reports and As-Built Drawings are the source for determining whether or not projects were built according to design.</p>	<p>Agreed. Design and completion reports are listed within the project documentation that is to be reviewed for this process study, and the design documents form the basis upon which the structured site observation protocols will be based. Any needed documents that SI does not currently have access to are included/will be included in document requests to LMMA.* This includes more comprehensive versions of some of the completion reports, all as-built drawings, and better-quality diagrams from design reports. <i>*Requests have since been fulfilled.</i></p>
<p><i>Section 3.2.2.1.1 Standards for assessing implementation fidelity</i> River Abstraction: As stated – target abstraction flow rate and daily volume to be abstracted; how the inflow sediment load is to be settled or screened out; where inflow is pumped, the number of raw water pumps, maximum to operate at one time and number to be on stand-by; intake desilting pump(s) type, number and required delivery. Pump power demand, optimum motor sizing and installed motor size to be stated. Manual and/or automatic operation. Corrosion protection and materials used for pipes, screens etc. Any secondary function installations.</p>	<p>Where is this screened out? I am assuming it is not the water coming into the reservoir. Most likely it is filtration starting at the treatment plan, but I could be wrong.</p>	<p>This is the raw water at river or sand abstraction intake.</p>
<p><i>Section 3.2.2.1.1 Standards for assessing implementation fidelity</i> Raw Water Pipeline: As stated – corrosion protection to be well designed and applied, size to be compatible with design flows and head losses. Flow meter, instantaneous and totaling, with remote read out. Secondary items to be incorporated, such as check valves, scour valves and air release /air ingress valves.</p>	<p>This should also help them identify technical losses from leaks in the system depending on where these flow meters were placed and accuracy. A relatively new system should not see too many leaks, especially with the corrosion protection. It will happen over time. Is the utility monitoring this?</p>	<p>WASCO has stated that they have no real measurement of losses (non-revenue water) for smaller areas, only estimates for the system as a whole. These flow meters are really to assess losses through the WTW, in filter backwash or sediment evacuation from clariflocculators or in tanks at sediment.</p>

<p>Section 3.2.2.1.1 Standards for assessing implementation fidelity OPERATION BY ADEQUATELY TRAINED STAFF</p>	<p>4: Are there environmental staff present, and how/are they monitoring any downstream technical impacts? Also need to confirm H&S staffing. 2: SI: See list of questions I added to Attachment C.</p>	<p>Agreed, see Attachment C.</p>
<p>Section 3.2.2.1.1 Standards for assessing implementation fidelity OPERATION BY ADEQUATELY TRAINED STAFF Water Treatment Works: Log all tests, inspection activities and changes made to processes. Test raw water and finished water quality daily if constant – more often if changing. Log all indices. Check flocculation dosing effectiveness. Note filter bed head losses. Schedule backwashing.</p>	<p>1: It would be very interesting to see if they can maintain the required monitoring regime. Does the system break down? Do they have reagents for the testing? Are they following testing protocols (i.e. QAQC)? They could get false results. Gaps in data? 2: SI: will the site visit checklist already capture these issues or can tweaks be made accordingly?</p>	<p>This is now listed in the structured observation protocol/check list, for WTW. Also, the availability of reagents is related to the review of funding. SI has also added the WASCO Laboratory Manager to the list of key informants to be able to ask questions about the monitoring regime at the various sites. WASCO Regional and Area managers, as well as site operators, will also be asked.</p>
<p>Section 3.2.2.2 Performance Evaluation EQ4) To what extent has a management unit been established for the Semonkong water system? To what extent has WASCO HQ provided support to those managing the new system in Semonkong?</p>	<p>As noted above, also need to understand how wastewater is being handled and if there are any negative impacts associated with the lack of a wastewater treatment system.</p>	<p>See earlier responses.</p>
<p>Section 3.2.2.2 Performance Evaluation SI has been informed of the probable involvement of the Lesotho Highlands Development Authority (LHDA) in the monitoring of dam safety issues but understood this was yet to be formalized.</p>	<p>OK, it looks like there should be a dam safety plan in development. What is the timeline for completing this? How will it be implemented?</p>	<p>The usual frequency of dam safety inspection and reporting is five years, with quarterly reports from the dam operating staff via a fixed format questionnaire. See Attachment C, for added questions for SI to follow up on the development and formalization of the dam safety plan. Also dam management plan has been added to the list of documents to be requested from WASCO related to the Metolong Program.</p>
<p>Table 4, Project documents to be reviewed for process evaluation</p>	<p>4: The ESIA's may also be relevant 2: SI: Apparently some of these O&M issues should have been laid out in the original ESIA's. I don't think I have these but LMDA should. These were required to get the original permits so if WASCO isn't following them, they'd be considered out of compliance. Can you request this documentation and then we figure out whether it's necessary to compare it with what WASCO is actually doing?</p>	<p>SI has added ESIA's to the list of documents to be included in another request to LMDA. They have also been added to this list (Table 4). To date SI has not seen any mention of ESIA's* or any reaction in design reports to the return from WTW's of filter backwash or sediment direct to the river – these should be dried and disposed of in some way adequate to immobilize them, such as incorporation in burnt clay bricks. The instream flow requirements for the river below the Metolong Dam have been assessed and apparently are being released. <i>*SI has since received some relevant documents.</i></p>

<p>Section 3.3.2. Key Informants</p>	<p>Please provide some context for who has been proposed, like an overall statement that SI will consult with all key players responsible for A, B, C, along with the role each person or function in this list plays.</p>	<p>Added statement and revised bulleted list into a table to added notes on role/function of each KI.</p>
<p>Section 3.3.2. Key Informants</p>	<p>5: Need to add PDNA who were the designers and supervisors on the UPUW project. If possible, it would be good to interview individuals from the PIU that replaced SMEC. After MCA decided not to execute SMEC's contract option, MCA established a new PIU that included staff seconded from WASCO, an international engineer brought on board through a consulting contract with MCA (CES Consulting Engineers Salzgitter GmbH) and MCA staff. [redacted]</p> <p>2: SI may also want to talk to MCC's Independent Engineer (MWH). [redacted]</p>	<p>List now includes [relevant individuals]. The first three have also been added to the list of contact information needed in Section 3.5.1., and at the time of submission this contact information has been requested from LMDA.</p> <p>[redacted]</p>
<p>Attachment C. List of key informants</p>	<p>Would there be any value in talking with any of the construction contractors? You'll see that I also asked about MCC staff and our independent engineer in the EDR.</p>	<p>SI expects that a conversation with the construction contractors after the trip would provide more insight than before the trip. SI plans to make a decision on whether there would be utility in talking to the construction contractors, after the in-country data collection has taken place.</p>
<p>Attachment C. [redacted]</p>	<p>Learning from the TZA water experience, is it worth asking WASCO employees whether they felt they were adequately trained/prepared to take over the infrastructure and properly manage/maintain it? This is linked to some of the questions in here already, but from a slightly different angle. I think it would be helpful for MCC to learn how to better prepare implementing entities for takeover. I think the later guides sort of get at this.</p>	<p>Question has been inserted into relevant KII guides.</p>
<p>Attachment C. [redacted]</p>	<p>Should we ask anything related to tariffs or do you think the question about managing deficits will elicit that discussion if relevant?</p>	<p>We anticipate it would come up naturally within this discussion. We have added a probe in this KII guide.</p>

<p>Attachment C. [redacted]</p>	<p>ESP raised a number of environmental and social-related O&M issues. This mostly boils down to determining whether appropriate plans are in place and being implemented and resourced appropriately. Here are the specifics they flagged: Is there a management plan for the Dam? Does this plan cover (or do separate plans exist for) dam safety, environmental management, health and safety, and watershed management? Do these plans include monitoring of (1) water quality (e.g. identify potential disease vectors and/or increase costs of treatment); (2) water quantity (how much water is behind the dam wall); (3) discharge (against requirements); and (4) sedimentation? Is this happening in practice? Evidence of that? Do they have the staffing and budget in place for these plans?</p>	<p>Added to relevant KII guides.</p>
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