



GOVERNMENT OF THE
VIRGIN ISLANDS
Premier's Office



VIRGIN ISLANDS
**RECOVERY AND
DEVELOPMENT AGENCY**

Water Network Improvement: Reservoirs and Metering Evaluating Value for Money

Project Number: WAT.02.27.140

Water Network Improvement: Reservoirs and Metering

Value for Money (VfM) Assessment Report

1) INTRODUCTION

One of the core roles of the Recovery and Development Agency (RDA) is ensuring Value for Money (VfM) in the delivery of programmes and projects aimed toward recovery and development of the Virgin Islands. Section 5(2)(c) and (d) of the Virgin Islands Recovery and Development Regulations outline the value for money mandate of the RDA, specifying that:

The Agency shall be responsible for implementing the Government’s Recovery and Development Plan in partnership with the Ministries and in so doing shall:

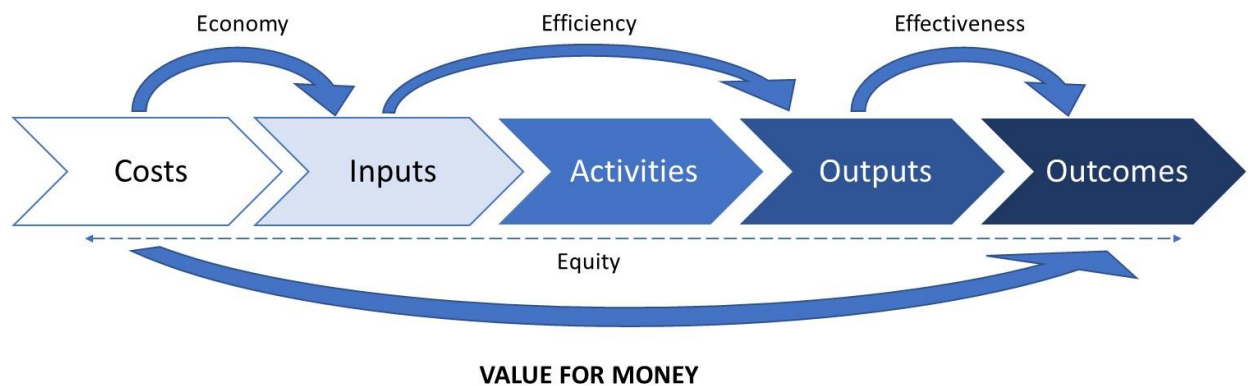
- (c) deliver the intended benefits; [and]
- (d) ensure that each project represents value for money.

To this end, the RDA has developed a Value for Money Framework and Methodology, which uses specific criteria to assess projects’ Value for Money and assigns an overall VfM score for each project.

The VfM score is made up of eight indicators (listed in Table 1) within the four outlined areas of Value for Money, namely Economy, Efficiency, Effectiveness and Equity.

Table 1: Value for Money Areas within the 4Es

VALUE FOR MONEY AREA	
Economy	Economy
Efficiency	Output Cost, Output Time, Schedule
Effectiveness	Output Effectiveness, Outcome Effectiveness, Quality
Equity	Equity



The Water Network Improvement project began in May 2020, aimed at rehabilitating three reservoir sites on Tortola, namely the Long Bush, Carrot Bay and Zion Hill reservoirs. This involved replacement and installation of four (4) tanks as well as adjoining required pipes, and installing gate valves as well as residential and bulk meters. This project was funded by the Caribbean Development Bank (CDB), through the Rehabilitation and Reconstruction Loan (RRL) portfolio of projects which have included works on roads, schools, administration buildings and water infrastructure. These projects were handed over to the Recovery and Development Agency (RDA) for implementation in early 2020.

Works on the Water Network Improvement project has included rehabilitation of four (4) water tanks as well as installation of required pipes and meters. Rehabilitation of the three reservoir sites has been aimed at improving access to potable water and reducing the cost of public water subsidisation. Using \$4,838,818.91, this project was able to deliver on its planned outputs, with no valid defects reported in the ensuing months.

The following sections of this report assess the overall Value for Money of the Water Network Improvement project, using the methodology outlined in the RDA’s VfM Framework Guidelines for Economy, Efficiency, Effectiveness (Equity was not scored for this project).

2) Overview of Overall VfM Score (57.9 out of max 100 points)

Challenges to this project achieving a higher VfM score were largely related to costs and time, having fallen well outside its original budget as well as its planned schedule and time benchmark. In terms of outcome effectiveness, the project did not conclusively demonstrate achieving its expected outcome of improving access to potable water and decreasing public subsidisation of water, resulting in only partial points being assigned for outcome effectiveness. Achieving its planned outputs, with no valid defects reported within the ensuing period, the project was able to achieve full points for Output effectiveness as well as Quality.

Water Network Improvement – VfM Scoring			
Economy	Economy	0/10	0/10
Efficiency	Cost Efficiency	20/20	20/40
	Time Efficiency	0/10	
	Schedule	0/10	
Effectiveness	Output Effectiveness	20/20	35/45
	Outcome Effectiveness	5/15	
	Quality	10/10	
Equity	Equity Goals	NA/5	NA/5
Overall VfM Score			55/95
Total Adjusted VfM Score			57.9/100

The overall VfM score was 57.9 out of 100. This indicates scope for improving overall Value for Money in terms of costs and time, as well as achievement of the broader outcome. Spending above the expected budget, in combination with some delays in project implementation, with timelines exceeding the expected schedule and the time benchmark used affected the economy and efficiency scores.

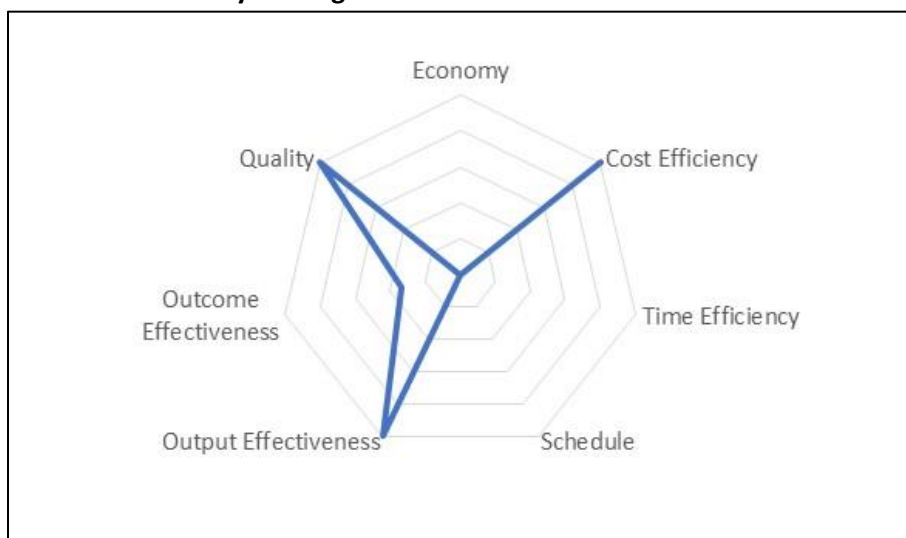
Following discussions on the importance of improving timing of RDA-implemented projects, given that efficiency is a core argument for the continued existence of the RDA in facilitating public sector recovery and development, a decision has been made to present an enhanced scoring framework for Value for Money in the RDA context, which further highlights the importance of timing. As such, the Table below presents a more time-focused assessment of VfM for the CDB-funded Water Network Improvement project.

Water Network Improvement – Time Focused VfM Scoring			
Economy	Economy	0/10	0/10
Efficiency	Cost Efficiency	20/20	20/50
	Time Efficiency	0/15	
	Schedule	0/15	
Effectiveness	Output Effectiveness	20/20	32.5/35
	Outcome Effectiveness	2.5/5	
	Quality	10/10	
Equity	Equity Goals	NA	NA
Overall Time Focused VfM Score			52.5/95
Total Adjusted Time Focused VfM Score			55.3/100

A focus on the time element results in an Overall Adjusted VfM Score of 55.3 out of 100 for the Water Network Improvement project. Going forward, the time focused VfM Score will be provided alongside the original VfM Scoring framework in all future VfM Reports, to further put into focus the importance of efficiency gains in RDA-implemented projects.

As part of an effort to continuously improve, the RDA has implemented cost containment strategies through more detailed planning efforts and improved time management to help propel efficiency gains and more adequately capture user requirements.

Figure 1: Overall Value for Money Scoring – Radar Chart



The overall Value for Money Scoring Chart (Figure 1) demonstrates the excellent scores received for Cost Efficiency, Output Effectiveness, and Quality, while assessment of Outcome Effectiveness resulted in partial points, and assessment of Economy, Time Efficiency and Schedule resulted in no points being awarded.

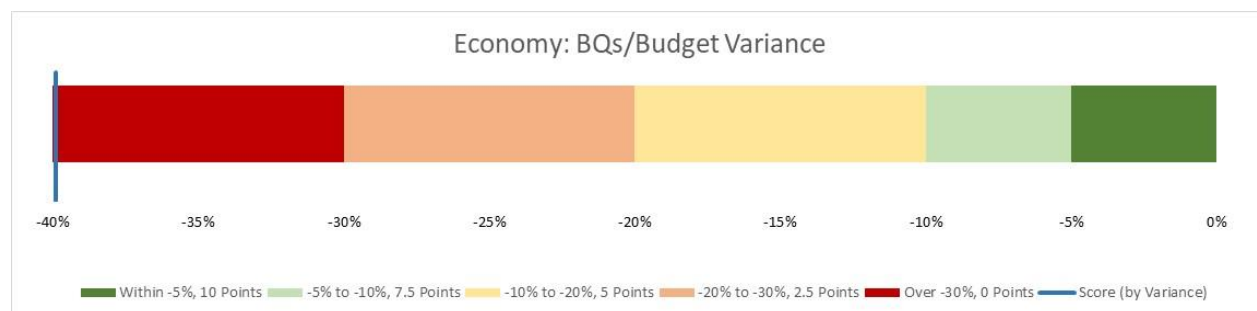
3) ECONOMY (0 out of max 10 points)

The economy of the Water Network Improvement project has been assessed based on the original budget for the project agreed with the CDB, at \$2.21 million.

The total spend for this project as at end of May 2022 is \$4.84 million which is approximately 118.95% above the original budget. The variations to project costs were related to required retaining walls required to be taller than originally planned, due to prevailing site conditions. These variations had both cost as well as time implications. The final project costs coming in well-above the original budget resulted in this project not being assigned any points in assessment of its Economy (Table 2).

Table 2: Assessment of Economy

ECONOMY ASSESSMENT: 0/10 POINTS	
Original Budget	\$2,210,000.00
Actual Spend	\$4,838,818.91
Variance (\$)	(\$2,628,818.91)
Variance (%)	(118.95%)
ECONOMY SCORE	0



4) ON BENCHMARKS USED

In calculating VfM Scores for both Cost and Time Efficiency, consideration has been given to performance against relevant benchmarks established for the production of specific outputs. Giving a background of the benchmarks used, and why, provides the necessary context for comparisons made.

In the case of the Water Network Improvement project, the following benchmarks for cost and time have been used to assess cost and time efficiency:

Type	Benchmark	Sources	Considerations
Cost	\$2.80 per gallon of water storage	Angi's List: https://www.angi.com/articles/how-	Average of water storage costs per gallon (from \$0.60 to \$5.00)

		much-does-water-tank-replacement-cost.htm	
Time	3,342 gallons of water storage installed per day	Number of gallons of water storage installed divided by number of planned project days	Average number of gallons of water storage installed per day

Cost Benchmark

The cost benchmark has been determined based on the average cost per gallon of water storage installed quoted on the Angi’s List website: <https://www.angi.com/articles/how-much-does-water-tank-replacement-cost.htm> (See Table above for details).

Time Benchmark

The time benchmark used was calculated based on the number of gallons of water storage to be installed and the planned number of project days. In the context of the Water Network Improvement project, this translated to a total of 3,342 gallons of water storage installed per day.

5) EFFICIENCY (20 out of max 40 points)

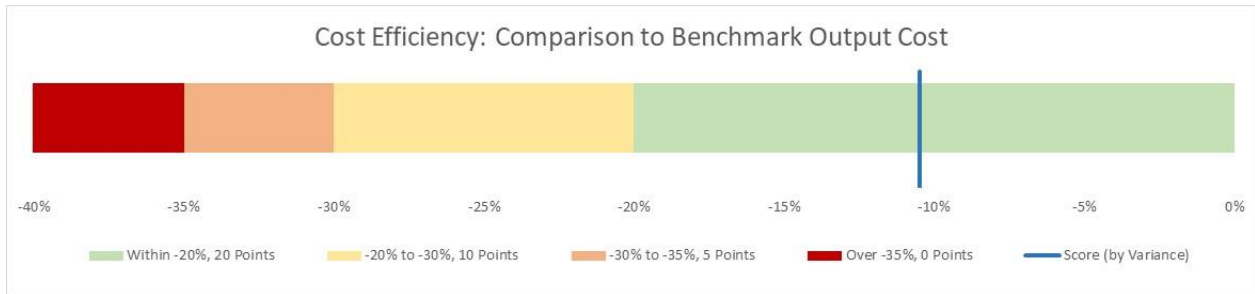
The efficiency of an intervention considers Output Cost (Cost Efficiency), Output Time (Time Efficiency) and Schedule.

Cost Efficiency

In terms of output cost, the project involved rehabilitation of four (4) tanks comprising 1,564,218 gallons of water storage, namely 816,936 gallons at Long Bush; 645,702 gallons at Carrot Bay; and 101,580 gallons at Zion Hill. This translates to an average of \$3.09 per gallon of water storage installed. Based on research conducted, a benchmark cost for installation of water storage of \$2.80 per gallon has been used, sourced online from Angi. In this way, the cost of each output for this project was just over the benchmark cost used, but still allowing for a full twenty (20) points to be assigned for cost efficiency (Table 3).

Table 3: Cost Efficiency Assessment

COST EFFICIENCY ASSESSMENT: 20/20 POINTS	
Output Unit Cost	\$3.09 per gallon
Benchmark Output Unit Cost	\$2.80 per gallon
Variance (\$)	(\$0.29)
Variance (%)	(10.5%)
COST EFFICIENCY SCORE	20



Time Efficiency

Having started on 7 May 2020, all three project activities were initially slated to be completed by 12 November 2020. In reality, all project activities were not completed until 3 December 2021. It should be noted that a portion of the delay in project implementation was related to work on the Zion Hill Reservoir being postponed until the Carrot Bay Reservoir was brought fully back online. In this way, between late July and early Dec 2020, while work was scheduled to begin, it was postponed to ensure continuous water access for the surrounding community. Additionally, delays in project implementation were also related to Covid-19, in terms of manufacturing and shipping of required materials, and travel plans of required tank installation teams. The total number of project days across all three projects was 1,351 (1,217 when adjusted for the imposed delay), compared to a planned number of project days at 468, some 160% over the targeted schedule. With 1,564,218 gallons of water storage installed in the Territory over a period of 1,217 adjusted days, this translated to an average of 1,316 gallons of water storage installed per day. The benchmark output unit time used is 3,342 gallons of water storage installed per day, based on the targeted outputs and targeted schedules for the three project activities. The actual output time was therefore 60.6% above the output time benchmark used, thus no points were assigned for Time Efficiency for this project (Table 4).

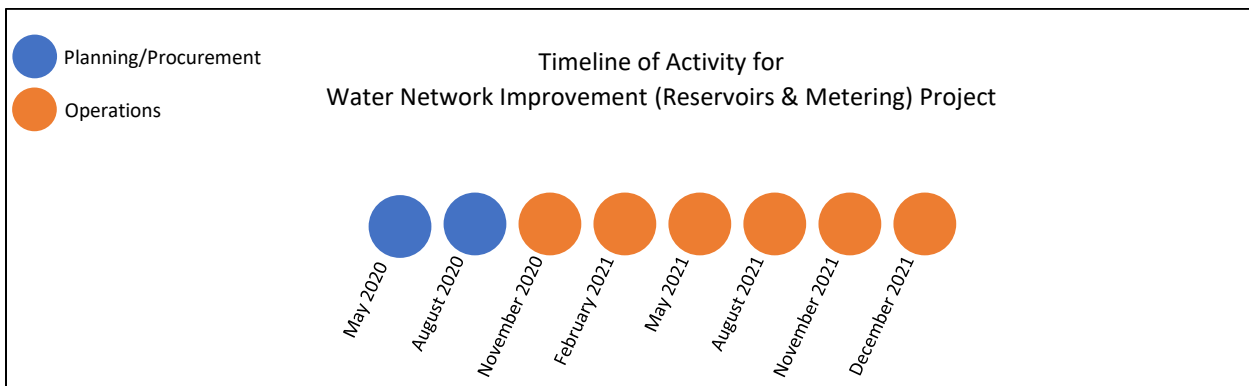
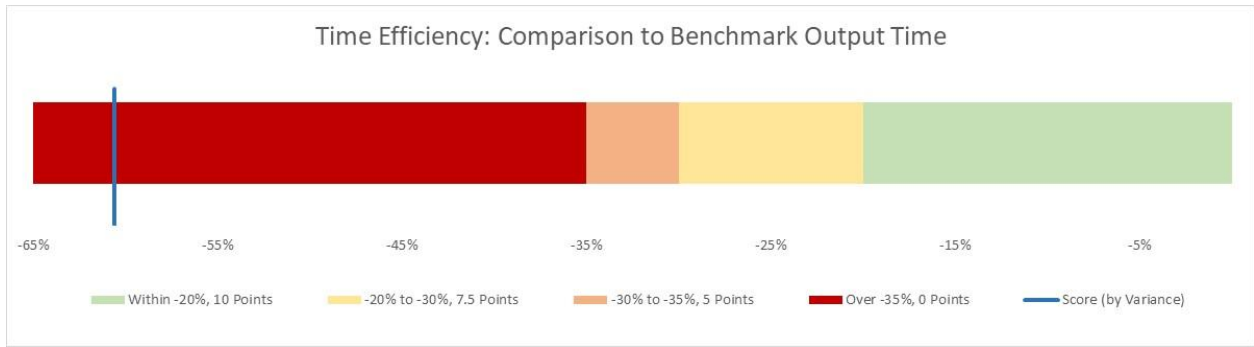


Table 4: Time Efficiency Assessment

TIME EFFICIENCY ASSESSMENT: 0/10 POINTS	
Output Unit Time	Avg. 1,316 gallons of water storage installed per day
Benchmark Output Unit Time	Avg. 3,342 gallons of water storage installed per day
Variance (sq ft.)	(2,026)
Variance (%)	(60.6%)
TIME EFFICIENCY SCORE	0

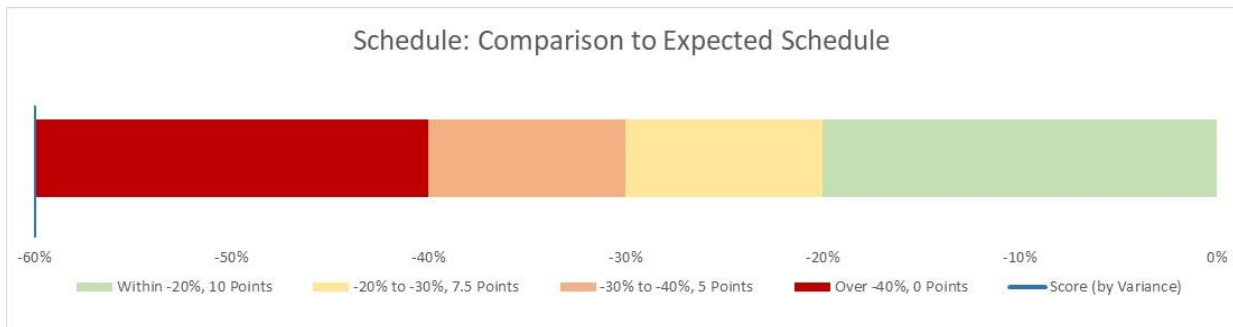


Schedule

In terms of schedule performance, given that there were 468 or over a full year of planned project days compared to a total number of adjusted actual project days which stood at 1,217, this variance of 749 days meant that the project was not assigned any points in its Schedule assessment (Table 5).

Table 5: Schedule Assessment

SCHEDULE ASSESSMENT: 0/10 POINTS	
Planned Project Days	468 days
Adjusted Actual Project Days	1,217 days
Variance (days)	(749 days)
Variance (%)	(160%)
SCHEDULE SCORE	0



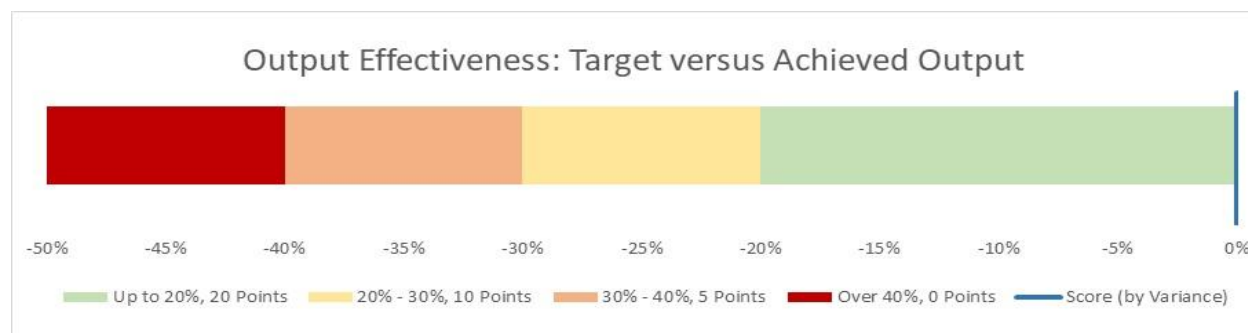
6) EFFECTIVENESS (35 out of max 45 points)

Output Effectiveness

Output effectiveness is a measure which compares targeted output indicators to achieved output indicators. In the case of the Water Network Improvement project, the total number of gallons of water storage targeted for installation to improve access to potable water was 1,564,218 gallons. The project was able to install 1,564,218 gallons, and hence a full 20 points has been assigned for Output Effectiveness (Table 6).

Table 6: Target versus Achieved Output

OUTPUT EFFECTIVENESS ASSESSMENT: 20/20	
Targeted Outputs	1,564,218 gallons of water storage
Achieved Outputs Rehabilitated	1,564,218 gallons of water storage
Variance	0
Variance (%)	0%
OUTPUT EFFECTIVENESS SCORE	20

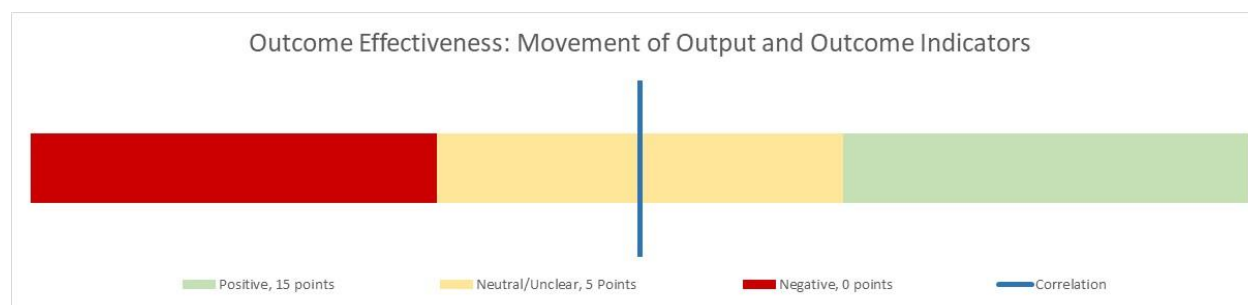


Outcome Effectiveness

In terms of outcome effectiveness, the change relationship between the observed output and outcome has been used as a simple measure of outcome effectiveness. Using this methodology, the directional change in output is compared to the directional change in outcome. In the case of the Water Network Improvement project, the output: number of gallons of water storage installed in the Territory, moved in a positive direction; while the outcome: public subsidisation of water consumption largely remained static. As such, the relationship between the main output and outcome for this project has been assessed as neutral or unclear, and a score of 5 out of 15 points has been assigned for this project's Outcome Effectiveness (Table 7). Even though more gallons of water storage were available in the Territory, public subsidisation of water is still taking place at a very high rate. Similarly there are still observed issues in access to public water in the areas where reservoirs and meters were installed, seemingly due to water distribution deficits.

Table 7: Relationship between Outputs and Outcomes

OUTCOME EFFECTIVENESS ASSESSMENT: 5/15	
Output Change: gallons of water storage installed	+1,564,218
Outcome Change: increased access to potable water or decreased public subsidisation of water	No significant change detected
Assessment of Change Relationship	Neutral/Unclear
OUTCOME EFFECTIVENESS SCORE	5



Quality

In terms of Quality, reports of valid defects have been used as the basis on which to assess the Quality of the Water Network Improvement project. No valid defects were reported within the defects and liabilities period for the project, hence a full ten (10) points have been assigned for quality of this project.

Table 8: Quality Assessment

QUALITY ASSESSMENT: 10/10	
Number of valid defects reported	0
Quality Assessment (Standards)	Met
QUALITY SCORE	10

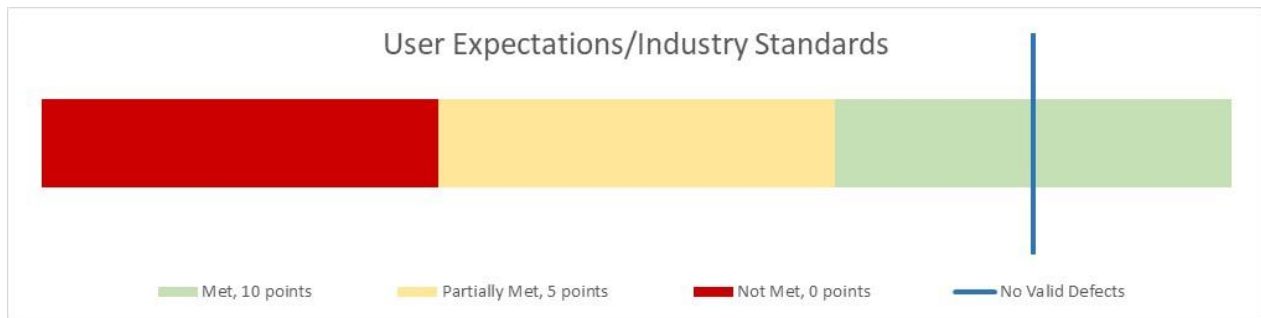


Figure 2: VfM Score Comparison with Other Completed Projects



7) Lessons Identified

Lessons identified coming out of the Water Network Improvement project include:

- 1)** Encourage contractors to order required supplies and equipment with adequate lead time given existing supply chain issues which affect arrival of items and can negatively affect construction schedule. Factoring updated supply expectations into project schedules will also help to account for reality, and provide more realistic schedule targets; and
- 2)** Importance of understanding the linkages between outputs and expected outcomes, and the external factors that comprise the context required in order for outcomes to be achieved. The RDA must work closely with partner Ministries, Departments and Agencies to ensure that factors external to the project are adequately in place such that the envisioned outcomes can be achieved. In the case of the Water Network Improvement project, while the Reservoirs have been reconstructed, there are still significant water issues in areas where the Reservoirs serve, due to issues in water distribution. For this reason, in conjunction with billing and collection challenges, the value which Government subsidises water in the Territory has actually increased since reconstruction of the Reservoirs and installation of meters.

8) Conclusions

This report has been prepared using the RDA's Value for Money Framework in assigning a VfM Score to the Water Network Improvement project based on Economy, Efficiency, and Effectiveness (Equity was not scored for this project). The importance of keeping accurate, up-to-date, readily accessible information on project budgets, schedules, spending and results has once again been underlined in the process of conducting this VfM assessment. The Monitoring and Evaluation (M&E) Team continues to play an important role in reviewing the quality of this information, and collating data for calculation of projects' VfM scores.

Achieving points out of 57.9 points out of 100, the Water Network Improvement project's VfM could have been enhanced through improved cost containment, time management and outcome management. That said, the project was able to achieve its targeted outputs at a high level of quality, within the cost benchmark used demonstrating perfect scores in Cost Efficiency, Output Effectiveness and Quality.