FINANCING KIDRON/WADI EL NAR REVITALIZATION:
A BRIDGE TO DEVELOPMENT

July 2013
ACKNOWLEDGEMENTS

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Executive Summary

This report describes the contours of a potential financing plan for sewage infrastructure in the Kidron Valley—one of the region’s most culturally, historically, and environmentally pivotal resources for economic development. In 2010, the Kidron Basin Working Group proposed the Kidron Basin Master Plan, a comprehensive, integrated infrastructure and economic/community development plan for the redevelopment of the Kidron Basin from the Old City to the Dead Sea – crossing between Israel and Palestinian areas. One of the main elements of the master plan and pre-conditions for sustainable development is infrastructure finance to clean-up the sewage flowing through the Kidron Valley.

This financing plan is based on discussions with stakeholders and leadership throughout the region and on the market conditions for project financing in the region. The elements of this plan are intended to be market-based, leveraged, and financially feasible and sustainable. The core of the plan focuses on the development of sewage infrastructure to collect, treat, and distribute over 15 million cubic meters from the Jerusalem region, 85% from Jerusalem and 15% from Palestinian areas. The estimated cost of this core infrastructure is ₪355 million, including collection lines, modular treatment facilities in Ubeidiya, and effluent lines to transport gray water into the Kidron Valley.

The proposed model suggests the creation of a special purpose vehicle (SPV), to provide the sewage collection and treatment services on a contract basis with the Israeli and Palestinian Water Authorities, using a combination of bonds, private and social equity, and subordinated debt through the capital markets, international development financial loans and guarantees, and philanthropic impact investments. This project-financing model is feasible based on the proposed capital structure, terms, and estimated market conditions. Further, the new infrastructure will enable and support the growth of tourism and tourism-related revenues in the greater Jerusalem region serving economic development goals of both Israeli and Palestinian communities. New businesses and the expansion of existing businesses will provide incremental value-added taxes, real estate taxes, improvement taxes, use fees, and license fees, which broaden the case for financial and fiscal feasibility for the project.

Based on this financing concept, we suggest that the project should move forward on to the development of a detailed plan, including contract terms, detailed engineering, capital and operating estimates, and commitments from financial participants. The proposed capital structure aligns economic, financial and environmental needs for river revitalization and economic development in the shared Kidron-Wadi El Nar River Basin.
INTRODUCTION

The purpose of this document is to describe the contours of a potential financing plan for sewage infrastructure in the Kidron Valley. There are many possible approaches, given the context, international interest, and market conditions. This plan is based on discussions with stakeholders and leadership throughout the region and on the market conditions for project financing. The elements of this plan are intended to be market-based, leveraged, and financially feasible and sustainable.

BACKGROUND

In 2004 Israeli, Palestinian and German scholars studied the management of the Elbe Valley with the Kidron Valley, to compare how political borders affect basin management. The study brought to light the importance of ignoring political borders in basin management and led to the establishment of a steering committee to develop a master plan for the Kidron Valley (Wadi El Nar, in Arabic). The Milken Institute Israel Center was asked to join the steering committee in 2007, and subsequently initiated a Financial Innovations Lab® to focus on trans boundary water projects. The Lab identified the barriers in several key areas, including consistent regulation, multi-lateral institutions, and sustainable financing. One of the potential projects identified in the Lab was the Kidron Valley, a unique, internationally-significant heritage district with a complete lack of sewage infrastructure.

As a result, the Kidron Basin Master Plan, with a vision for the basin, has been completed and is currently in its implementation stage. The Milken Institute Israel Center has participated in the planning process and is now focusing on the business initiatives developed during the process. A major initiative is the removal of the sewage in the basin and joining five cities and towns to a single waste water treatment plant (WWTP). The WWTP will not only purify the sewage, but will also return purified effluent back to the basin users and serve as a center for environmental study.

The collaborative work between Israeli and Palestinian experts in the Kidron Valley/Wadi Nar has been the touchstone for setting up a transboundary framework for integrated basin management. It is our hope that this model will serve the other transboundary rivers and streams in the region including the Besor/Hebron, Jenin/Kishon, Zomer/Alexander, and other watershed river/stream basins.
PLAN

In 2010, the Kidron Basin Working Group proposed the Kidron Basin Master Plan. The Master Plan is a comprehensive, integrated infrastructure and economic/community development plan for the redevelopment of the Kidron Basin from the Old City to the Dead Sea – crossing between Israel and Palestinian areas (see Figure 1).

Figure 1 Components of Kidron Basin Master Plan

The core of the plan focuses on the development of sewage infrastructure to collect, treat, and distribute over 15 million cubic meters from the Jerusalem region. The estimated cost of this core infrastructure is ₪355,164,239 (see Figure 2).

Figure 2 Kidron Sewage Treatment Capital Budget (Phase A)

<table>
<thead>
<tr>
<th>Capital Cost</th>
<th>Estimated Cost (NIS)</th>
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<tbody>
<tr>
<td>Sewage Lines</td>
<td>24,697,600</td>
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<tr>
<td>Treatment Plant</td>
<td>179,177,700</td>
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<tr>
<td>Effluent Lines</td>
<td>21,800,000</td>
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<td>Contingency</td>
<td>11,283,765</td>
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<td>Soft Costs &amp; O/P</td>
<td>47,391,813</td>
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<td>Financing Costs</td>
<td>7,240,147</td>
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<td>Capitalized Reserve</td>
<td>58,318,205</td>
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<td>Working Capital</td>
<td>5,255,008</td>
</tr>
<tr>
<td></td>
<td>355,164,239</td>
</tr>
</tbody>
</table>

Source: Milken Institute, 2013
The main trunk line will follow the Kidron River basin from Wadi Joz in Jerusalem, past Jabbel McAber, Suwahra, Beit Sahoor and Ubeidiya (see Figure 3). A pump and treatment facility will be based in Ubeidiya. The gray water effluent lines will return purified effluent for irrigation in the Kidron/Wadi Nar basin. Based on this infrastructure, the plan outlines development of a business cluster, focusing on the environment, heritage, education, recreation and tourism, which will strengthen of the financing plan itself and the economic health of the region directly and indirectly.

Figure 3 Map of Alternatives for Treating the Kidron – Wadi El Nar Basin

MODEL
The Kidron Sewage Treatment project combines the public and private sectors to create a business model. This model is known as a public private partnership, shifting risk and returns to the private sector and harvesting the public benefits and sustainability for the public sector.

PROJECT FINANCING
As illustrated in Figure 4, a special purpose vehicle (SPV) is created as a separate, limited recourse, single purpose corporate entity (1). The SPV is owned by partners, including limited partnership such as cash equity investors, professional team, contractors, and operators. It is managed by a general partner that has the responsibility for all operations. The SPV hires all professional services, including the contractor for the design and construction of the infrastructure and treatment plant itself (2). The SPV then hires the operator for the collection, treatment and distribution services (3).

Figure 4 Project Model - Direct Revenues

The SPV signs a long term contract with the Israel Water Authority and the Palestinian Water Authority to provide the sewage collection and treatment services. In turn, the Government provides a variety of tap-in, flushing, drainage, and water treatment fee payment (4) to the operator.

In addition to the direct government fees, the SPV will be able to sell a variety of products, including gray water, compost, and energy sales on the market and on long-term contracts to strengthen the operating revenues (and underlying credit) of the project (5).
In order to strengthen the direct revenue, the project financing model includes several indirect revenue sources. As part of the project plan, the infrastructure will support the growth of tourism and tourism-related revenues in the greater Jerusalem region. As shown in Figure 5, new businesses and the expansion of existing businesses (6) will provide incremental value-added taxes, real estate taxes, improvement taxes, use fees, and license fees (7), which make the case for a partial government guarantee for the project financing (8). Additionally, the incremental value created in the region will permit the use of revenues from events, services, and even a portion of the incremental taxes themselves from the expanded hospitality and tourism activities in the region, such as hotel room-nights (9). These indirect revenues are based on the increases in tax revenues from the new infrastructure which can provide additional reserve funding (10) for the project.

All of these direct and indirect sources support the plan for a project financing (11) for the special purpose vehicle.

**Figure 5 Project Model - Indirect Revenues**

Source: Milken Institute, 2013
**CAPITAL STRUCTURE**

Based on the market conditions, costs, and risks, we are proposing a hybrid capital structure, including the following equity, debt, and guarantee components (see Figure 6):

1. **Equity** – Provided through in-kind services and cash contributions from limited partners. The equity is required upfront.
2. **Senior Debt** – The senior tranche of debt will be structured through a 20-year revenue bond sold in the capital market through a private placement. The senior debt will have a priority lien on all project income and assets, with limited recourse only to the SPV.

**Figure 6 Scenario I - Sources**

3. **Subordinated Debt** – If needed, a subordinated tranche of debt will be structured through a 20-30 year loan or bond. The subordinated debt will have a second lien position on all project income and assets. The price is expected to be below market rates. The sources for the subordinated loan will be development finance institutions, including the World Bank’s IDA program, USAID loan programs, and the European Investment Bank.
4. **Social Equity** – In order to improve cash flows on the project and provide additional debt coverage to the senior and subordinated debt, we are proposing an investment through World Bank’s IDA program, providing a grant that converts to equity based on cash flow performance and the market rate equity and senior debt reaching a minimum return.
5. **Guarantees** – To strengthen the credit position of the senior debt, and lower the interest rate by an estimated 50 basis points, the senior bonds will be covered by a limited guarantee against first losses on 20% of the outstanding debt. The amount of the guarantee will be reduced as the debt coverage improves. Sources for the limited guarantee will include a

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Source: Milken Institute
mix of Israel Government guarantees, the USAID’s OPIC<sup>9</sup> program, and the World Bank’s Partial Risk Guarantees (PRG)<sup>10</sup>.

6. Construction Financing – Depending on the composition of the partnership and their cash investments, the project company is expected to arrange an interest-only construction financing loan until the construction is completed and the project operation has stabilized, expected by years 3-5. During this period, the construction loan will be based on a 60% loan to value. Upon permanent financing, the loan to value is to rise to almost 70%, paying back a substantial portion of the cash equity invested by the project company.

**PROJECT REVENUES**

The project financing structure includes several streams of direct and indirect revenues, as described in the Project Financing section above.

1. Service Revenues – The primary revenues for the project financing will come from service fees paid by the water authorities in Israel and the Palestinian Authority. Based on the projections of sewage sources, an estimated 85% of the service fees will be paid by the Israel Water Authority (Gihon) using the prevailing water treatment fees paid by Jerusalem residents. The remaining 15% of the service fees will be paid by the Palestinian Water Authority. In both cases, the authorities will contract with the SPV directly for the services.

2. Sales Revenues – The secondary source of revenues for the SPV will come from contract sales for treated gray water to the Palestinian Authority for

Figure 7 Projected revenue sources (20 years of operations)
Agricultural uses. Again, in this case, the contracted sales will be covered by long-term contracts. For purposes of modeling, only 65% of the gray water is included in the sales revenue projections.

3. Indirect Revenues – In order to boost the credit for the SPV, we are proposing a contribution to the project reserve funding (and underlying credit enhancement) based on the estimated incremental taxes or fees\textsuperscript{11} resulting from increased sales revenues by the region’s hotels for a designated period of time. The concept for the use of these indirect revenues is based on the projection of increases in hotel room stays from the new tourist attractions in the Kidron Valley. These attractions are expected to increase tourists’ rates, particularly international tourists, and will lead to them spending extra time (and an extra night) in a Jerusalem hotel. If needed, a portion of these incremental revenues can be taxed and allocated as a Government contribution to the project reserve funding to the SPV to cover a portion of the debt on the capital costs of the project. Otherwise, they will be used for economic development programs and projects within the project area as the senior debt is retired. The assumptions for these revenues and the allocation to the SPV are included in the next section.\textsuperscript{12}

Assumptions
The financial plan includes many assumptions about revenues, costs, cash flow, and financing. Below is a summary of selected assumptions.

1. Revenues
   a. Estimated sewage volume is 14,800,000 cubic meters per year based on a Base Year 2010, with an annual growth rate of 0.50\%.\textsuperscript{13}
   b. These service rates are a weighted average of 2.51 per cubic meter in 2013 for the both the Israeli and Palestinian customers. Service revenue growth is 0.50\% per year.
   c. Gray water sales are estimated at 65\% of the gross sewage volume.
   d. The market price for the gray water is NIS 0.50 (the market range is NIS 0.42 to NIS 0.68 in various regions in the Palestinian Authority. Market price for gray water sales is estimated to grow by 0.75\%, capping out at approximately NIS 0.63 per cubic meter.

2. Operating Costs
   a. The cost of treatment of sewage is estimated at NIS 0.55 per cube.
   b. Annual maintenance costs of the treatment facility are estimated at 0.25\% of the capital costs. Management costs are estimated at 0.35\% of the revenues.
   c. Other operating costs include insurance, utilities, security, and financing fees.
   d. Expense escalation is 2\% per year.
3. Cash flow
   a. Net revenues are based on 95% of gross revenues. The operating margin for the project is estimated at 75% of the net revenues.
   b. The tax rate expected for the SPV is estimated at 12%-15% of taxable income.

4. Capital Budget
   a. All capital costs are escalated to a 2015 start year.
   b. The capital budget includes 20% of the hard costs allocated for design and engineering.
   c. Financing costs are estimated at 3% of the selected capital costs. The capitalized reserve is sufficient to cover 100% of the projected annual debt payment. A working capital fund is capitalized based on the possible operating losses during the start-up and scale-up of the treatment facility.

5. Financing
   a. The senior bond is priced at 5.5% for 20 years. The payments are flat, fully amortizing the bonds at term. The expected market is 5%, but the limited guarantee is estimated to reduce the coupon price by 50 BP. The actual price for the senior debt will be based on market conditions at the time of the bond issue.
   b. If applicable, the subordinate debt is priced at 4.5% for 30 years. The payments are flat, fully amortizing the bonds at term.
   c. Depreciation of the capital assets is projected on a straight-line basis for an average useful life of all project assets of 22 years.
   d. The guarantee will be based on 20% of the senior debt until the debt coverage ratio exceeds specific thresholds: Less than 1.25 X–20%; between 1.50 X and 2X – 10%, and greater than 2X– 0%.
   e. The guarantee will yield a fee of 0.15% of the outstanding debt, paid out of the project cash flows.

6. Returns
   a. The distribution of cash flow is triggered by reaching thresholds on the multiple for returns of capital to the cash investors (hurdle rates).
   b. As the hurdle rate is achieved, the balance of distributions to investors will change.
   c. While the guarantors earn a fee on the outstanding guarantee, the guarantors will earn a portion of the distribution of cash flows.
   d. The Social Equity will not earn any return on capital during the project until the hurdle rate is achieved. Once achieved, the Social Equity will earn an “upside” distribution based on the success of the project.
7. Selected Direct Financial Impacts
   a. Increment taxes and fee revenues are based on an estimated 3.2 million overnight stays in Jerusalem region; 2.6 million overnight stays are from international travelers.
   b. The growth rate of the volume international travelers (overnight stays) is estimated at 3% per year.
   c. The direct revenues from each overnight stay from international travelers are approximately NIS 335. The growth rate in the per-night rate is estimated at 1% per year.
**Feasibility**

We summarize three capital structure scenarios below. Scenario I is described in this document fully. The other scenarios below demonstrate the financial feasibility with alternative sources of funds. Scenario II shows a bond and equity. Scenario III demonstrates no private equity, but includes a bond, subordinated debt, and social equity. All other revenue and cost and project assumptions remain the same.

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<td>₪355,164,239</td>
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<td>Net Revenues</td>
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<td>Senior Debt Coverage</td>
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<td>Cash Flow</td>
<td>₪4,837,136</td>
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Risks
The proposed project financing has multiple risks. Below is a list of these risks and steps that should be taken to mitigate these risks:

<table>
<thead>
<tr>
<th>Category</th>
<th>Explanation</th>
<th>Mitigation</th>
</tr>
</thead>
</table>
| Development| Complicated project implementation; uncertain collateral developments to support regional growth | • Integrated planning  
• Stakeholder involvement and investment  
• New financial resources to fuel economic and community development |
| Market     | Multiple users, payment history, weak collections; indirect connection between revenues from increases in tourism; no take or pay sales of water | • Long term, single payer contracts with water authorities (Israel and Palestinian)  
• Long-term, single payer Government contract for payment based on projected tax increments  
• Long-term take or pay contract by Palestinian Authority for treated water |
| Performance| Ability to perform collections, treatment, and distribution processes and operations | • International tender with world-class contractors and operators  
• Performance bonuses  
• Completion and Performance bonds |
| Security   | Disruptions caused by vandalism and conflicts                                 | • Insurance  
• Stakeholder investment |
| Geopolitical| Conflicts among stakeholders; complicated trans boundary financial operations and contract enforcement, and payment transfers | • Global insurance coverage  
• Refinancing - cash equity exit provision |
| Financial  | International bonds/loans denominated in Euro and Dollars with payments in NIS; Risks of fixed interest rate for long terms | • Use currency hedge or contingency  
• Use variable rate interest rate swap instrument |
**PROJECTIONS AND RESULTS**

Based on the assumptions described in this plan and capital structure described in Scenario I above, the project yields positive, sustainable results.

The project debt extends for 30 years, including the senior and subordinate debt (see Figure 9). Based on the proposed terms for the coverage from the limited guarantee, the guarantee is reduced when the debt cover exceeds the amount needed to pay the debt and will be released completely before the repayment of the debt, when the debt coverage exceeds 2X what is needed to pay the debt.

Figure 9 Outstanding debt and reserve coverage (scenario I)

The net cash flow is positive from the beginning of the project, although the capital budget is holding working capital to cover unforeseen shortfalls in the operating revenues or costs in the operating costs (see Figure 10). When the senior debt is paid back, estimated cash flow is available.
The distributions commence with the cash equity investors immediately with positive cash flows, reaching an IRR of approximately 14%. Once the hurdle rates of payments to the cash equity investors is met, returns will be distributed to the other parties, ranging from 5% to the guarantor, 5% for the social equity (see Figure 11).

**Figure 11 Estimated Distributions and Rates of Return (scenario I)**

For each of the groups, these distributions are in addition to the interest and fees paid during the project, where applicable.
CONCLUSION

The proposed project financing is feasible on the basis of the proposed capital structure, terms, and estimated market conditions. Based on this financing concept, the project should move forward on to the development of a detailed plan, including contract terms, detailed engineering, capital and operating estimates, and commitments from financial participants.
NOTES

1 Simon Klawitter, Natalie Mullak, Georg Meran, Nir Becker and Nader Khateeb, “WWT Management Option for the Kidron Valley/Wadi El-Nar” (paper prepared for the German-Israeli-Palestinian research project “From conflict to collective action: Institutional change and management options to govern transboundary watercourses”), http://www.academia.edu/2358512/WWT_management_option_for_the_Kidron_Valley_Wadi_Nar


4 Based on 11.11.12 estimate of capital costs by Afik Engineering

5 Depending on the structure of the contracts for construction, services, and ownership for services provided by equity partners, if the project company does not hire the service providers (because of a tender process), the agreed-upon value of the service providers may be reimbursed upon permanent financing.

6 The International Bank for Reconstruction and Development (IBRD) aims to reduce poverty in middle-income countries and creditworthy poorer countries by promoting sustainable development through loans, guarantees, risk management products, and analytical and advisory services.

7 The European Investment Bank provides project loans and other financial services for the European Union. Approximately 10% of the EIB’s portfolio is invested in targeted non-EU regions. http://www.eib.org/products/loans/index.htm

8 The World Bank’s International Development Association (IDA) provides investments in regional integration, providing special financing for programs that cross international boundaries and assist distressed and poor populations. http://www.worldbank.org/ida/theme-integration.html

9 OPIC – The Overseas Private Investment Corporation is the US’s development finance institution, providing investors with loan guarantees, insurance, and support for private equity investments. http://www.opic.gov/what-we-offer/financial-products

10 World Bank Partial Risk Guarantees (PRG) covers private lenders against the risk of a public entity failing to perform its obligations with respect to a private project. PRGs ensure payment in the case of default resulting from the nonperformance of contractual obligations undertaken by governments or their agencies in private sector projects. PRGs typically cover outstanding principal and accrued interest of a debt tranche. http://web.worldbank.org/external/default/main?theSitePK=3985219&pagePK=64143534&contentMDK=20260268&menuPK=64143504&piPK=64143448
The use of these revenues directly will require regulatory and statutory approval. Alternatively, the Government may decide to count these new revenues as an internal offset for a commitment of funds, either current or capitalized, to the project through the Ministry of Infrastructure.


Volumes and demand projections are included in the Kidron Master Plan, 2011.