Department of Antiquities

Petra
Petra Development & Tourism Region Authority
سلطة إقليم البترا التنموي السياحي

STATE OF CONSERVATION REPORT

FOR PETRA ARCHAEOLOGICAL PARK

Foreword

Mr. Kishore Rao
Director,
The World Heritage Center
7, place de Fontenoy
75352 Paris 07 SP,
France

Dear Mr. Rao,

Re: **State of Conservation Report for Petra Archaeological Park, 2014, and Response to the World Heritage Committee's Decision 37 COM 7B.50**

With specific reference to the World Heritage Committee's subject decision concerning the World Heritage site of Petra, we are pleased to submit the State Party's State of Conservation Report herewith. This summarizes initiatives and challenges at the Park, and integrates our intervening actions that respond to each and all issues and provide information for consideration at the World Heritage Committee 39th meeting session.

Signed,

Dr. Emad Hejazeen

Commissioner for Petra Archaeological Park and Cultural Heritage

Petra Development and Tourism Region Authority

Dr. Monther Jamhawi

Director General

Department of Antiquities
Ministry of Tourism and Antiquities

ACRONYMS

ACOR	American Center for Oriental Research
CBRL	Centre for British Research in the Levant
CRM	Cultural Resource Management Program
DRR	Disaster Risk Reduction
DOA	Department of Antiquities
ESIA	Environmental and Social Impact Assessment
ICOMOS	International Council for Monuments and Sites
ISPRA	Italian Institute for Environmental Protection and Research
JICA	Japanese International Cooperation Agency
MOTA	Ministry of Tourism and Antiquities
OUV	Outstanding Universal Value
PAP	Petra Archaeological Park (the Park)
PDTRA	Petra Development and Tourism Region Authority
PNT	Petra National Trust
NGO	Non-governmental Organization
RFP	Request for Proposals
TOR	Terms of Reference
UNESCO	United Nations Education, Science and Culture Organization
USAID	United States Agency for International Development
USDOI	United States Department for the Interior
US-NPS	United States National Park Service
WHC	World Heritage Committee
WHS	World Heritage Site

PETRA WORLD HERITAGE SITE - PROPERTY DATA

State Party

The Hashemite Kingdom of Jordan

State Party

The Hashemite Kingdom of Jordan

Identification Number

326

Year of inscription on the List of World Heritage

1985

Type of Property

Cultural

Geographic Information (lat/long)

30°19'50"N, 35°26'36"E

Area

264 square kilometers

Government Institutions Responsible for the Property

Ministry of Tourism and Antiquities (MOTA), Department of Antiquities (DOA), with Petra Development and Tourism Region Authority (PDTRA – management jurisidiction)
Located in the Governorate of Ma'an, Jordan

Criteria

(i) (iii) (iv)

Previous Committee Decisions

1994, 1995, 1996, 1997, 1998, 2000, 2001, 2010, 2011, 2013

Previous monitoring missions

2000: ICOMOS Mission
2004: UNESCO Mission
2009: UNESCO Technical Expert Missions
2010: World Heritage Centre/ICOMOS Reactive Monitoring Mission

Factors affecting the property identified in previous reports

a) Lack of a management plan for the property
b) Lack of clear boundary delimitations

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1. Response to the World Heritage Committee
Decision 37 COM 7B.50

1.1 Introduction

As detailed in this ***State of Conservation Report***, and as a part of the Petra Archaeological Park priorities' program, the management has undertaken positive actions in response to the decision arising from the 37th session of the World Heritage Committee (WHC), (Appendix II: Decision 37 COM 7B.50 of the World Heritage Committee). The relevant WHC decision excerpts are presented, and the subsequent actions are summarized, in this first section of the report.

Recognized as a World Heritage Site in 1985, the retrospective Statement of Outstanding Universal Value for Petra summarizes the reason for its inclusion (Appendix I: The Retrospective Statement of Outstanding Universal Value for Petra, 2010).

In accordance with the ***Operational Guidelines for the Implementation of the World Heritage Convention***, (specifically paragraph 172), the collaborative Petra Archaeological Park management of Petra Development and Tourism Region Authority (PDTRA), the Petra Archaeological Park (PAP/'the Park') and the Department of Antiquities (DOA), have continued to inform the World Heritage Committee of activities that potentially affect the Outstanding Universal Value of the site. Indeed, the Park management have communicated beyond this basic requisite, and are in frequent communication with the World Heritage Centre Secretariat and the United Nations Education, Science and Culture Organization (UNESCO) Office in Amman, as well as communities of stakeholders, in efforts to inform and seek input on planning and preliminary development concepts.

As the custodians of the site, the collaborative Park mangement are committed to safeguarding Petra, in accordance with the obligations of the Hashemite Kingdom of Jordan (hereafter, Jordan) under the ***UNESCO World Heritage Convention***. This report summarizes the work in progress, describing present and future initatives to protect a wider definition of the site's cultural significance, natural significance and cultural landscapes.

In addition to its World Heritage cultural site status, PAP is a national historic site that is protected under Jordan's Law of Antiquities No. 21 for 1988 and its amendments, and as such, Petra's resources are presided over by the DOA. In 1993, Petra was also declared a "Protected Site" by a decree of the Council of Ministers, thus establishing it as a park, with protection further reinforced in 1996. In 2007 the area of 264 square kilometers was established as the 'Petra Archaeological Park' which was re-emphasized under the PDTRA law number 15 of 2009.

World Heritage Committee Decision 37 COM 7B.50

"The World Heritage Committee,

1. Having examined Document WHC-1337/.COM/7B,
2. Recalling Decision 35 COM 7B.49 , adopted at its 35th session (UNESCO, 2011),
3. Acknowledges the information provided by the State Party on the implementation of conservation and management measures to address existing conditions at the property;
4. Urges the State Party to sustain on-going efforts, with particular attention to the following:

    a) *Finalize the delineation of the buffer zone and develop adequate regulatory measures to ensure its protection, and submit a minor boundary modification proposal by 1 February 2014 for review by the World Heritage Committee at its 38th session in 2014,*

    b) *Finalize the Petra Conservation Plan and develop a comprehensive Management Plan for the property, building on previous documents and ensuring synergies with existing planning initiatives; ensure official endorsement of existing plans (e.g. Operational Priorities Plan 2010-2015 or the Strategic Master Plan 20112030-) by the governing bodies; submit all completed plans related to the conservation and management of the property for review by the World Heritage Centre and the Advisory Bodies, and undertake the necessary adoption process to ensure their effective enforcement,*

    c) *Finalize the development of the Disaster Risk Reduction Plan and secure the necessary resources for its implementation, prioritising the stabilization of the Siq,*

    d) *Finalize the development of a visitor management strategy, including regulations for public use, in consideration of the carrying capacity of the property,*

    e) *Identify priority capacity building needs and implement the necessary measures to address them,*

    f) *Ensure that Heritage Impact Assessments, in relation to the Outstanding Universal Value of the property, are carried out for development works foreseen, and submit, in accordance to Paragraph 172 of the Operational Guidelines , project proposals and their technical specifications to the World Heritage Centre for review prior to committing to their implementation;*

5. Request the State Party to submit to the World Heritage Centre, by **1 February 2015**, an updated report on the state of conservation of the property and the implementation of the above, for examination by the World Heritage Committee at its 39th session in 2015."

1.2 Buffer Zone

The World Heritage Committee,
(37 COM 7B.50, item 4, 4b)

> *"Urges the State Party to sustain on-going efforts, with particular attention to the following:*
>
> *Finalize the delineation of the buffer zone and develop adequate regulatory measures to ensure its protection, and submit a minor boundary modification proposal by 1 February 2014 for review by the World Heritage Committee at its 38th session in 2014".*

1.2.1 Summary

Ensuring the preservation and protection of sensitive and special zones against urban sprawl and uncontrolled development is a paramount intent of the definition of buffer zones for World Heritage Sites. As stated in the World Heritage Operational Guidelines, the Buffer Zone,

> *"… is an area surrounding the nominated property which has complementary legal and/or customary restrictions placed on its use and development to give an added layer of protection to the property. This should include the immediate setting of the nominated property, important views and other areas or attributes that are functionally important as a support to the property and its protection".*[1]

In summary, and forming a part of the Park's conservation strategy, the Park management and PDTRA have undertaken steps towards the fulfilment of the WHC Decision (above).

The first layer of protection (the site boundaries) is delineated to protect the physical and intangible expression of outstanding universal value (OUV), integrity and authenticity inside the property. The added layer of protection (the Buffer Zone) is designed to protect the OUV, integrity and authenticity and their tan¬gible and intangible expression, specifically against external threats.

A comprehensive study to define and legally implement a Buffer Zone for the Petra Park has been completed by specialist consultants, Dar Al-Omran. The essential Buffer Zone definition has been developed with the best use of existing resources and legal instruments for protection. The Buffer Zone Plan includes a legal file detailing enforcement and monitoring mechanisms, and the means to ensure consistency with applicable laws, regulations and guidelines (see Folio I). The plan sets out an implementation road map with a synchronized implementation schedule and clearly defined responsibilities and time frames.

1.2.2 Buffer Zone Land Use Plan

The strategic principle of the develop¬ment of the Buffer Zone Plan is to:

> *"Transform the concept of development in land use plan from pure physical construction and*

1 UNESCO Operational Guidelines for the Implementation of the World Heritage Convention, Paragraph 104.

development to controlled oriented activities within an overall compromised management planning framework to achieve the different required levels of protection while achieving also the required socio-economic development"

(p. 5, Petra Archaeological Park Buffer Zone Plan, Legal File, 2014)

A Buffer Zone land use plan was developed as a part of the management, protection and planning tool, in which all components were delineated, demarcated, defined and shown as follows:

- *Boundary of PAP and Boundary of the Buffer Zone*
- *Proposed Land Uses*
- *Archaeological Sites (different types)*
- *Waterways and their Buffers*
- *Steep Slope Areas*
- *Hisheh Forest*
- *Ownership*
- *Proposed Re-zoning and Amendments*
- *Existing Zoning*
- *Existing Buildings*
- *PDTRA Border and Jurisdiction Borders*

The land use map and the special regulations proposed in the buffer zone identify the areas' potential and limitations, classifying areas within the buffer zone and protected areas as follows:

- *A Protected Area including four main areas as follows:*
  - Areas of high sensitivity - no development should be allowed
  - Area adjacent to Um Sayhoun Settlement
  - Areas along Al-Beidha Road
  - Agricultural Areas
- *Eco-Tourism Areas*
- *Agricultural Use Areas*
- *Eco-Overlooking Areas*
- *Viewing Nodes*
- *PAP Special Management Zone.*

The buffer zone land use plan is submitted in a form of final draft that was developed under the direct monitoring of a technical committee represented by park stakeholders[2]. The final draft was officially endorsed by the DOA Management and PDTRA Council. By end of January 2015 the land use regulations will be declared to the public for a period of two months, allowing for local community feedback ***(Appendix I – Buffer Zone)***

2 Technical committee members included representation from DoA, PAP, PDTRA, UNESCO Amman and local community representative.

1.3 Conservation and Management Planning

The World Heritage Committee,
(37 COM 7B.50, item 4, 4b)

> *"Urges the State Party to sustain on-going efforts, with particular attention to the following:*
>
> *Finalize the Petra Conservation Plan and develop a comprehensive Management Plan for the property, building on previous documents and ensuring synergies with existing planning initiatives; ensure official endorsement of existing plans (e.g. Operational Priorities Plan 2010-2015 or the Strategic Master Plan 20112030-) by the governing bodies; submit all completed plans related to the conservation and management of the property for review by the World Heritage Centre and the Advisory Bodies, and undertake the necessary adoption process to ensure their effective enforcement".*

1.3.1 Conservation Action Plan

Consistent with the WHC Decision (above) and the need to undertake conservation documentation and actions, the Park management now has a comprehensive framework to guide its organizational, planning and field programming.

It is widely acknowledged that Petra has a good base of management planning documents drafted, including plans and studies undertaken in the years of 1968, 19921996 ,1994- and 2000. Their review enabled the Park management to further develop key recommendations for the Operational Priorities Plan 20102015-. The Conservation Action Plan builds upon the management framework and information presented in the draft Conservation Plan. The outcome of the work is the definition of a conservation priorities schedule, or a 'road map' for the implementation of incremental actions. The Conservation Plan is presented in three main parts:

Part I. Plan Framework
Part II. Key Issues
Part III. Conservation Strategies

The guidelines and principles presented in previous Petra management and operational plans have been reviewed, and have been revised and expanded in compliance with the WHC Decision (35 COM 7B.49, item 5b):

> *"… based on recommendations of existing management and operational plans … define conservation guidelines and principles to guide future interventions at the property … ".*

The tremendous scale of Petra, and the sheer number of monuments and features that constitute its immovable cultural heritage (an estimated 3200 rock-cut monuments and archaeological features), requires a clear definition of priorities to determine conservation initiatives in planning, research and intervention. In the Park, there are more projects and issues for action than resources: time, budget or ability.

The initiatives, projects and actions selected are to make best use of existing and expected resources and to also address the most pressing issues or problems. Safety has been consistently ranked as the most important factor in the consideration of conservation work and abating risks. The priority of action is not only based on the potential human or natural risk; economic and technical feasibilities are also taken into account in determining which actions would be taken first.

The Conservation Action Plan categorizes previously defined 'at risk' monuments into rankings to highlight where conditions create a higher risk of danger to safety as well as survival of a feature. Over fifty features are categorized, with assessments based on:

- *Likely hazard or risk to public safety*
- *Estimated danger of imminent collapse*
- *Cumulative advantage and extended benefit of action or mitigation effort*
- *Location*
- *Previous and precedent baseline and technical research*
- *Landmark value and previously assessed values*

The features designated for priority action are ranked as follows:

- ***Critical:*** *Field diagnostic / assessment work to commence in the next 46- months*
- ***Essential:*** *Field diagnostic / assessment work to commence in the next 1012- months.*

To improve the knowledge of risks and conservation priorities, short-term work includes the updating and expansion of an inventory of the immovable features. Initially, all monuments which have been defined as 'at risk' are to be surveyed and baseline condition and monitoring reports completed in the first four months of the inventory project. With further progress, the outcomes of the inventory work will expand the ability for early 'alerting' of monuments at risk.

The 'Priorities for Action' present strategic selections, match identified issues and directly linked to the defined objectives, principles and guidelines. The explanations and demand for the projects are also identified in the Plan's Part II: Key Issues. The implementation schedule is organized in the following categories:

- *Organization: Site Management, Documentation Centre*
- *Field Research: Inventory and Condition Reporting, External Research Applications, Archaeological Field Campaigns*
- *Conservation Interventions: Preventive Conservation, Comprehensive Conservation Projects*
- *Risk Mitigation and Emergency Preparedness: Risk Identification, Emergency Operations, Mitigating Measures*
- *Consultations and Cooperation: Local Liaison, Park Uses and Zoning.*

In accordance with the WHC decision, the Petra Conservation Action Plan was officially endorsed by DoA and PAP in December 2014. The Petra Conservation Action Plan is included in a folio accompanying this State of Conservation Report.

As part of a wider engagement to develop a comprehensive Site Management Plan for the park, the DoA and PAP in partnership with UNESCO Amman developed ToR for commissioning the site management plan study led by experts provided by UNESCO. (Appendix II – Conservation Action Plan)

1.3.2 Collaborative Management

In 2014, the collaborative Petra Archaeological Park management has invested considerable effort to update the legal framework for Park operations. The updated bylaws no. 82 of 2014 were finalized and endorsed in July 2014 governing all site activities relating to site protection and tourism management. This legal record is supported by a framework of protocols and working instructions to define the roles and responsibilities between PAP and DOA. Formally structuring these fundamentals is, for the first time, establishing how the organizations can work in a compatible and complimentary way for the conservation, including the overall presentation and regulation of the site. This framework is currently being detailed to be signed off by the two parties, DOA and PAP, in the form of an official Memorandum of Understanding (MoU). (Appendix III - A framework of protocols and working instructions)

1.3.3 Advisory Groups

Technical Task Force groups are formed project-by-project to provide counsel and directives for specific initiatives. Membership is dependent on requisite skills that are deemed necessary for project assessment and determination of issues arising.

The allocation of Technical Task Force groups enables collective counsel on a specific matter for a finite period that corresponds to the completion of the specific project. This process has been effective and will continue. A method of peer review, the consultation enables PAP to benefit from the informed views of private and public sector representatives, university scholars, artists and culture and anthropological specialists. For example, Technical Task Force groups have been formed for the renewable energy project, the back road rehabilitation project, the buffer zone study, the conservation plan, the animal welfare project, etc.

1.4 Disaster Risk Reduction

The World Heritage Committee,
(37 COM 7B.50, item 4, 4c)

> *"Urges the State Party to sustain on-going efforts, with particular attention to the following:*
>
> *Finalize the development of the Disaster Risk Reduction Plan and secure the necessary resources for its implementation, prioritizing the stabilization of the Siq".*

1.4.1 Disaster Risk Reduction Plan

The complexities of the resource management issues for Petra are amplified given the natural processes of weak stone decay, flooding, earthquakes, changing climatic conditions, etc. Halting these natural processes is not a realistic prospect, particularly given the scale of Petra.

In a UNDP supported project, "Integrated Risk Assessment for the Petra Development and Tourism Region" (2013), the risks associated with potential earthquakes, flashfloods, landslides and rock fall risks are assessed. It is determined that the majority of the foundation geology of the Wadi Musa area is 'low to average' in the case of seismic activity.

Earthquake study scenarios include modeling the effects of a magnitude 7 earthquake with epicenters between 140 and 100 km distances. The assessments review the potential impacts on roads, high-tension power cables buildings, culverts and retaining walls.

Using a 100 year floodplain, flood risk modelling, assessments and mapping conclude that there was a risk of excessive flood velocities and a likelihood that retaining walls would slide under such hydrostatic pressure, causing potential damage to roads and neighbouring buildings.

The study makes recommendations for the control of stability problems associated with rockfalls and landslides. These are predominantly related to provision of safety nets in some area, changes to the geometric design of roads and an expansion of investigations to include slope stability analysis.

As a part of the UNDP led project in 2014, a Flash Flood Study was carried out. PDTRA has determined that an Early Warning System (EWS) for flash floods is a priority initiative. The intention of this is to alert authorities at the earliest time, coordinate different agencies and develop a sustainability plan for long term program operation. The following components are to be acquired to commence the first phase of the EWS:

- *Eight rain flow gauge stations (supplied with solar cell)*
- *Two rain flow meter stations (supplied with solar cell)*
- *Two computer control units (CCU)*
- *Two sirens for audio warning*

- *One billboard for visual warning*
- *Two servers*
- *One transmitter*
- *One receiver.*

1.4.2 Siq Stability Monitoring Program

The Siq is a 1.2 km gorge which is currently the only visitor entrance for access to the heart of Petra. It has been specifically identified for priority attention as it is particularly dangerous with its high rock walls (up to 70 meters) and volatile geological conditions. To further the risk, its restrictive width (3.4 meters at narrowest point) and limited access points make it hard to evacuate casualties in the event of emergencies. The risk to visitors and monuments due to landslide and rock fall is severe and therefore assessments and monitoring have been in progress for years.

Officially launched in 2012, the "Siq Stability - Sustainable Monitoring Techniques for Assessing Instability of Slopes in the Siq of Petra, Jordan" project was coordinated by UNESCO, predominantly funded by the Italian Institute for Environmental Protection and Research, and other project partners included the Petra National Trust (PNT) and the Zamani Research Group of the University of Cape Town, with collaboration of PDTRA and DOA as other individuals.

Crack gauges, engineering surveys with total stations and laser scanners, and photogrammetric techniques are installed in selected locations to monitor the structural geology and the threatening masses of rocks of the Siq. This equipment includes 60 micro prisms for historical fabric monitoring (within seven sectors of the Siq) that are monitored by a ground-based total station. There are also a series of wireless devices, including wire deformometers, extensometers, tilt movement sensors, wireless repeaters and a main data collector (gateway) to measure rock movements in five locations that were deemed most hazardous. During the two-week mission for equipment installation, it was necessary to manage visitor access to ensure safety whilst climbing activities were in progress.

Despite considerable effort, two incidents of rock falls have occurred in the Siq, neither of which was detected in the UNESCO field effort. This is indicative of the volatile state of Petra's geology and the difficulty in predicting or isolating risks. The two rock fall incidents were documented by the PAP monitoring team.

The Siq Stability project team members have conducted several training sessions with PNT, PAP and DOA staff on the use of equipment and the monitoring software, with the objective of enabling future, independent oversight of monitoring and competent use of the field equipment. In addition, training on climbing and equipment installation was conducted with local Bedouin males. A new Petra GIS system was also developed during the project by the Zamani Research Group and training on its use has been implemented.

A project Advisory Committee meeting was held in Amman in January 2014 with the project

partners and the project's External Scientific Advisory Board, to discuss the project's progress and the definition of a priority plan for 2014. Two follow-on field missions were undertaken to install additional reference points to ensure more accurate measurements in order to continue the development of a virtual tour of the site, and to complete the GIS training for PAP and DOA surveyors.

1.5 Visitor Management

The World Heritage Committee,
(37 COM 7B.50, item 4, 4d)

> *"Urges the State Party to sustain on-going efforts, with particular attention to the following:*
>
> *Finalize the development of a visitor management strategy, including regulations for public use, in consideration of the carrying capacity of the property".*

1.5.1 Park Use Regulations

To better preserve Petra through supervisory and regulatory measures, the existing Park use regulations were updated in 2014. The regulations now include:

- *Retail activities*
- *Horses, carriages and camels*
- *Filming*
- *Events*
- *Guides*
- *Camping*

Accompanying these revised regulations, a two-part events manual has been developed with one manual for PAP team use, and an instructive guide for event organizers' use. Legal experts have assessed these documents, prepared under the auspices of the USAID Jordan Tourism Development Project, and a regulatory bylaw was ratified by PDTRA in 2014.

1.5.2 Visitor Center

The Petra Visitor Center is a first impression of the Park and begins one's acclimatization to Petra. This is particularly important for the majority of visitors, who come to Petra for the first time.

The rehabilitated Petra Visitor Center officially opened in November 2014. The extensive interior and exterior renovations have rationalized the facility to showcase its range of facilities and interpretive resources. The result of almost two years of architectural design and execution, the visitor center is now befitting of the internationally recognized site. The renovation solution rationalizes and expands on the existing building's spaces and functions. This building reuse

approach is rational, comparatively economic and readily executed. The exterior 'skin' of the building has been replaced, and its front façade expanded for better visitor flow.

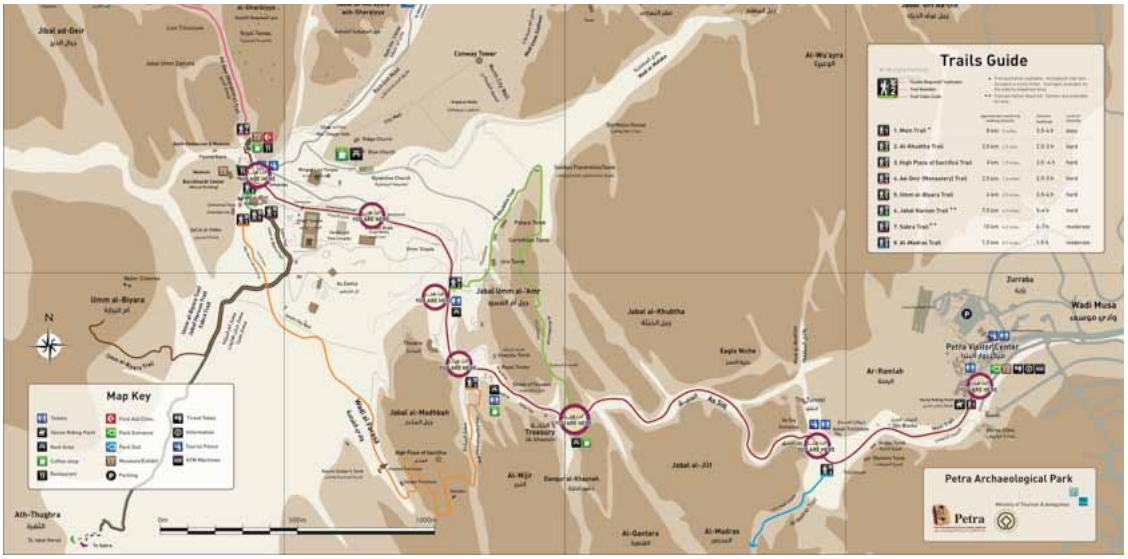
The design includes areas for reception and orientation, ticketing, guiding and interpretation and other visitor amenities. It also dictates a circulation pattern to promote a smooth flow and an enjoyable experience for the visitor.

A new range of visitor information material has been developed as a part of the USAID Jordan Tourism Development Project effort. This, and other information displayed at the visitor center, gives important instructions for visitor conduct and summarizes other useful information, including common site hazards, tour options and degrees of difficulty of trails. As a 'soft' form of visitor regulation, this information is intended to condition or prepare the visitor for a safer and more pleasurable site experience.

1.5.3 Ticket System and Site Access

The ticket system records arrivals and departures from the single entry and exit gate (introduced in collaboration with the USAID Jordan Tourism Development Project in 2009). In 2014, the entrance gate and turnstiles were introduced for controlled and efficient entry / egress.

The current ticket system also has the functional capacity to enable electronic, Internet-based purchase as well as the scheduling of entries at timed intervals, thus making it a very effective visitor management tool if fully deployed.



Excerpt from Park Brochure – *noting key facilities, trail guide and basic information. The brochure also includes safety and visitor conduct information.*

1.5.4 Site Signage

The final stage of the site signage program was completed in 2013, with the installation of site orientation maps at strategic locations. This stage also included hazard and directional signs for high elevation trails.

1.5.5 Rehabilitation of back exit road

After concluding a few years of detailed studies in close coordination with the WHC, the State Party addressed a crucial requirement of the WHC, rectifying the culvert design near the Turkmaniya Tomb. The State Party will proceed in launching the road rehabilitation works. A letter to this effect was sent to the WHC on July 03, 2014.

1.6 Capacity Building

The World Heritage Committee,
(37 COM 7B.50, item 4, 4e)

> *"Urges the State Party to sustain on-going efforts, with particular attention to the following:*
>
> *Identify priority capacity building needs and implement the necessary measures to address them".*

1.6.1 Context

In the Arab Region, management deficiencies have been identified as the leading threat to World Heritage sites, with the pressure for development on and around the sites following as the second most common threat.[3] In terms of adequate resources for operations at World Heritage Sites, it is also well acknowledged that in the Arab Region there is an urgent need to strengthen human resources, and that budgets are not sufficient for this, or for heritage conservation programs. [4]

In the interest of developing 'best practices' for the Park, PDTRA has proactively targeted and sought support wherever possible to assist in Petra's management and conservation. The management is thus benefiting from diverse, external expert advisors from institutions and international donors, as well as the private sector. These advisors include representatives from ICOMOS, the US-NPS and other consultants engaged from academia and professional practice. Further, Petra's many stakeholders, from researchers to non-governmental organizations (NGOs) and UN agencies, remain active and contribute significantly. In particular, the USAID Jordan Tourism Development Project, as well as the 2014 USAID Economic Growth Through Sustainable Tourism Project, have contracted supporting counsel as required (conservation architects, management and institutional specialists, cultural site managers, archaeologist, environmental engineers, architects, etc.).

These cooperative relationships have substantially augmented the capacity to manage emerging demands of the considerable site challenges.

1.6.2 Recruitment for PAP

As part of PAP efforts to build conservation capacity for the Park, the following new positions were hired as of December 2014.

- *Three archaeologists*
- *One Cultural Resource Management expert*

Other positions were announced to hire the following candidates:

- *Geologist*
- *Ecologist*
- *Hydrologist*
- *Conservation Specialist*

3 ICOMOS. "Threats to World Heritage Sites 19942004-, An Analysis", 2005.

4 The Periodic Report and Sub regional plans, summarized in the Regional Programme for the Arab States, March 2011 (presented as Item 10 of the Provisional Agenda, 35th WHC Session, WHC-1135/.COM/INF.10C).

1.6.3 Recent Training Initiatives

The following training activities were recently conducted:

1. Training sessions as part of the Siq Stability - Sustainable Monitoring Techniques for Assessing Instability of Slopes in the Siq of Petra, Jordan Project coordinated by the UNESCO Office Amman
    - *PNT, PAP and DOA staff have been trained on the use of equipment and monitoring software, to enable future independent oversight of monitoring and competent use of the field equipment.*
    - *Training on climbing and equipment installation was conducted with local Bedouin males.*
    - *Introduction to the applications of the new Petra GIS system (developed during the project) for the PAP and DOA surveyors.*
2. Training for the Park Rangers coordinated by USAID and US-DOI
3. Two Conservation Training Modules delivered by the USAID Economic Growth Through Sustainable Tourism Project for the DOA and PAP staff:
    - *Risk Management*
    - *Cyclical Maintenance*
4. Basic Field Training as a part of the Temple of the Winged Lions Cultural Resource Management Initiative:
    - *'Dump' remain removal as a part of instruction in basic archaeological methods*
    - *Cyclical maintenance*

5. Training of Byzantine Church guards on special cleaning techniques for mosaic floors.
6. A training course for two PAP employees on mosaic restoration at Madaba Institute for Mosaic Art and Restoration (MIMAR).

1.6.4 Identified Training Needs

Training needs are included in the Short Term Schedule (20142016-) of the Petra Conservation Action Plan. Categorized by activity, there are training requisites identified in the following priority areas:

- *Field Inventory and Condition Reporting Techniques*
- *Documentation Archivist*

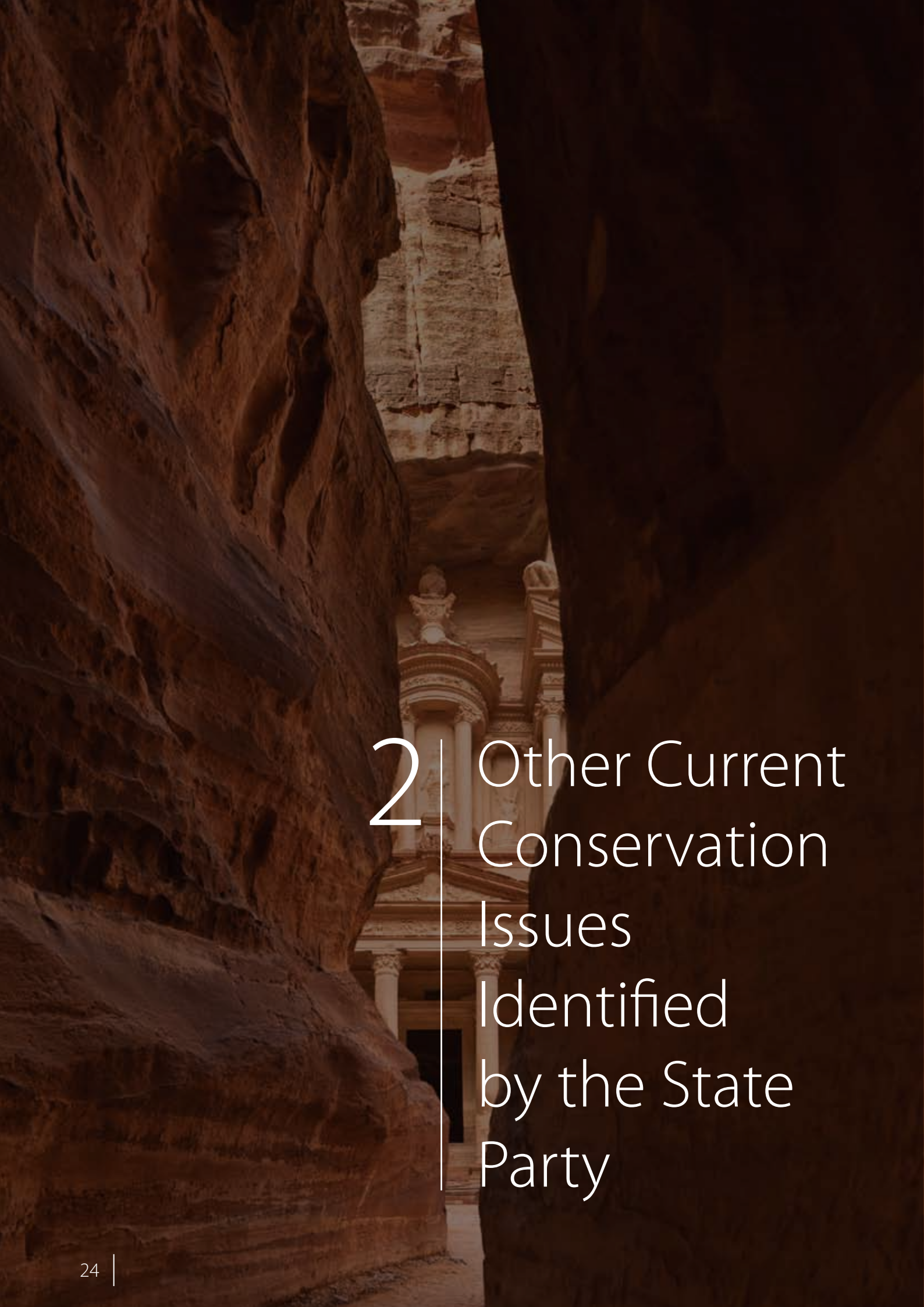
- *Archaeological Field Skills Development for Staff*
- *Preventive Conservation Training for Rangers and Staff*
- *Emergency Search and Rescue Skills for Staff*

As noted in the context (Section 1.5.1), the delivery of training sessions is highly dependent on coordination with collaborating agencies for the provision of teaching materials and skilled trainers.

1.6.5 PAP Archaeological Database

A database was initaited for documenting archaeological and site related activities such as:

- *Archaeological excavations*
- *Maintenance and restoration projects*
- *Research and studies*



2 Other Current Conservation Issues Identified by the State Party

2. Other Current Conservation Issues Identified by the State Party (APPENDIX II)/ EXACAVATION

2.1 Temple of the Winged Lions Cultural Resource Management Initiative

In 2009, the American Center of Oriental Research (ACOR) in Amman, Jordan, launched the Temple of the Winged Lions Cultural Resource Management Initiative (TWLCRM) in partnership with the DOA and PAP, and with cooperation from a large number of international organizations and missions. The project is in the midst of a multi-year campaign for the re-documentation, conservation, preservation, restoration, presentation, landscape rejuvenation, and re-publication of this important monumental complex. The project received some of its required funding through a 2011 U.S. Ambassador's Fund for Cultural Preservation Grant. Additional monies are derived from a USAID endowment for cultural heritage work in Petra that is administered by ACOR. Fundraising efforts continue, however, in order to ensure that all of the TWLCRM components can be completed.

The ACOR TWLCRM co-directors have submitted a précis of the past year's work, and excerpts are provided herewith.

Documentation

- *Registration of the architectural fragments from the original excavation that are scattered across the site, including any ashlars and architectural fragments recovered during the removal of the soil dumps*
- *Completion of the documentation of the current condition of the walls and other features in the temple cella*
- *Documentation of the current condition of the walls throughout the temple precinct*
- *After the clearance of Area I the exposed walls and floors will be documented before permanent backfilling*
- *The team will continue to create a complete photographic record for all of the work on the site.*

Conservation

- *Cleaning of the walls outside the main temple room in the northeast, southeast, and southwest sectors of the precinct*
- *Removing the cement/concrete mortars used by the original excavation team*
- *Installing hydraulic mortars inside these walls as needed for immediate stabilization and protection purposes*
- *Preliminary structural assessment study of the cella's columns*
- *The conservation team's work on the east interior wall of the cella and the sides of the cultic podium included:*
    - Dry cleaning with brushes
    - Salt removal using water

- Surface consolidation using a water-based consolidant
- Deep and finishing mortar repairs using a lime-based mortar

- *Undertaking necessary conservation and stabilization of walls in Area I prior to the permanent backfilling of the area.*

Landscape Rehabilitation

- *Training local team members in basic archaeological methods undertaken in the removal of dump remains*
- *Area I, east of the temple precinct, archaeologically cleaned in order to study and document the area before it is permanently backfilled*
- *Removal of the original excavation soil dumps (2), (3), and (4)*
- *Pottery and other materials recovered from screening the soil dumps cleaned and processed on the site*
- *Original excavation stone piles (2), (4) and (5) removed from the site. All architectural elements registered by the Documentation Team and then moved into areas for permanent storage. Rubble sorted for recycling and/or removal from the site*
- *The geotextile testing area constructed in 2012 re- opened for study.*

The team will consist of 10 to 15 local members with a rotation of two weeks for a total of four consecutive weeks and then a week of break. We estimate that the TWLCRM initiative will create approximately 5060- jobs and training opportunities for local community members during this period.

2.2 Ad Deir Plateau Project

The Ad-Deir Monument and Plateau: A Comprehensive Strategic Plan for Erosion Control, Excavation, Study, Conservation, and Restoration of Critical Archaeological Elements Impacting the Ad-Deir Monument at Petra, Jordan project proposal was submitted to PAP and the DOA in 2013. This continues to be the guiding document for the Ad Deir project, which is moving into Phase III in 2015. The project is being undertaken through Brigham Young University, Utah, USA.

The primary goals of the project are to study the complex erosion and deterioration forces impacting the Ad-Deir monument and begin to mitigate them, as well as to map all archaeological elements on the Ad-Deir Plateau and triage their conservation needs, especially in relation to seasonal water erosion. Where necessary, Nabataean water control systems that particularly impact/protect the Ad-Deir monument or other important archaeological sites on the plateau would be assessed for study, restoration and conservation.

Mapping for the Ad-Deir monument and Plateau Project included the first drone-linked GPS aerial and pedestrian survey on the Ad-Deir Plateau itself. This work also incorporated MEGA-Jordan inventory form analysis for each archaeological element mapped on the Plateau.

The 2014 conservation efforts focused on the most critical aspects impacting the Ad-Deir monument, as follows:

1. Two upper facade alcoves of the Ad-Deir monument were cleaned of all erosion debris in order to halt the damaging, seasonal water path at the front of the Ad-Deir monument. Over that past century, the erosion/wind driven sand had accumulated and channeled water. Two additional alcoves will be cleaned in 2015 in order to stop this erosion path and clear out all damaging tree and root growth.

2. The courtyard/temenos entrance on the west side of the Ad-Deir courtyard, as well as the lower facade of the monument were cleared of all flood erosion materials down to bedrock and to within three meters of the western edge of the courtyard. Over 70 Nabataean coins and one gold bead were recovered from the erosion debris, which also included copious amounts of pottery fragments. The far western end of the slot entrance was studied with regard to the remains of a Nabataean water control dam and then a modern water check dam was installed over bedrock to replicate the functions of the ancient dam that had been destroyed through erosion and neglect over the past 2,000 years. No mortar was utilized in the modern dam, only stone debris from erosion accumulation. This dam can thus be removed in future if necessary. Study of the previous Nabataean water control systems on the plateau impacting the Ad-Deir monument is on-going. In the process of clearing the erosion debris in the courtyard entrance, a previously unknown carved set of stairs was revealed, and these descend downward toward the courtyard of the western side of the Ad-Deir monument. This may indicate that a large cistern may exist under the courtyard itself, as it is one of the major focal points for water collection given the plateau›s topography. A second smaller check dam was established at the lower end of the stairs. Sandbags are used to support all architectural stone closest to the temenos access to the east. The sandbagging is reinforced with backfill to support the underlying structures and to stop the previous seasonal flooding that was damaging both the Ad-Deir courtyard and also allowing standing water to create salt damage at the base of the monument›s facade. These two check dams will be monitored and their condition assessed in December, and again at the beginning of the May 2015 season, at which time any necessary repairs or alterations can be undertaken.

3. Clearance and restoration of the Eastern Cliff cisterns commenced in 2014, the 100-year high level flooding in the park in early May completely filled all cisterns at that time and work will be restarted in 2015. In antiquity, these cisterns were critical, preventing water from the eastern cliff areas off of the Ad-Deir monument complex, as well as providing needed water resources for the plateau›s inhabitants during the Nabataean Classical Period.

4. A test trench excavation on the Great Circle at Ad-Deir revealed that it is a giant water catchment and control pool of 60-meter diameter. This feature once controlled over 50% of the erosion waters, which now impact the facade and courtyard of the Ad-Deir monument. Constructed by carving out the local bedrock, it simply needs to be cleared of erosion debris and can again serve its original function as a protective catch-pool

device to keep seasonal flooding from damaging the Ad-Deir facade. At the end of the 2014 season, all visual walls were sandbagged on both sides and then backfilled to protect the structure and its accompanying limestone and sandstone bedrock flooring.

5. Geologists carried out damage assessments for the second facade level of the Ad-Deir Plateau as well as tests to determine the origins of the current water seepage impacting the lower facade of the Ad-Deir Plateau. Their report will be completed in October 2014. A geological assessment of the spring systems on the Ad-Deir Plateau also commenced, which is specifically related to ground water conditions and the ongoing damage to the Ad-Deir monument arising from mineral salt crystallization. A rain monitor was installed on the Ad-Deir Plateau and ground water instruments were placed in the wadi just to the north and west of the Ad-Deir monument (which is now blocked by a modern dam). These instruments will record water quantities in this important ravine, which is also impacting water flow and resultant erosion of the monument›s facade. Readings from these two instruments will be collected and assessed in May 2015.

6. The periphery GPS/pedestrian mapping of the periphery regions of the Ad-Deir Plateau and the MEGA form documentation and assessments of all archaeological sites found during this comprehensive survey will be completed on site, mid 2015.

2.3 The Wadi al-Jarra Dam Rehabilitation Project, Phase II

The Petra National Trust (PNT) has coordinated the development and execution of works to research and rehabilitate the Wadi al-Jarra Dam. PNT-supported surveys have been intermittently conducted to understand the impact of flash floods in a number of areas where they have a high and damaging impact on monuments and visitor safety.

As part of these surveys, the evaluation of recorded elements led to a preliminary model of Petra's hydraulic infrastructure in antiquity. It has also established the first relative chronology showing how the entire system was developed over the centuries, how it declined and finally, its collapse. Each element of the system, its function in the entire network and its technical and constructive characteristics was determined as a result of this research.

Awarded project assistance from the American Ambassador's Fund for Cultural Preservation, PNT has been able to mobilize a team to carry out the Wadi al-Jarra Dam Rehabilitation Project in two phases. The second phase of the project began in 2013 and concluded in December 2014. The project milestones are summarized herewith:

Project Mobilization:

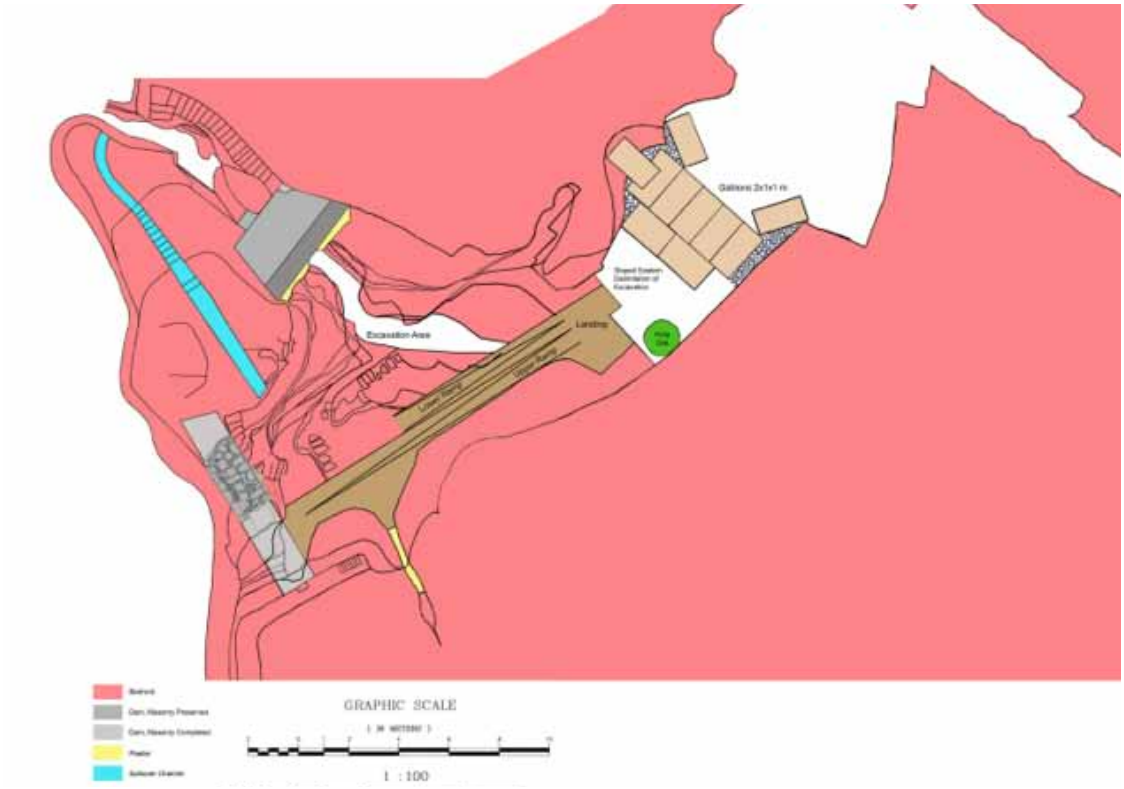
1. Formation of the project team
2. Coordination of logistics, i.e. transportation of materials and equipment, safety and security measures, staff special entry permits; the construction of the wooden ladders and ramps for better access, and the re-installation of climbing safety equipment

3. Cleaning the access area of debris to allow for a safe and un-obstructed passage to the site
4. Implementation of flood control measures

Works conducted:

1. Clearance of the excavation trench from the backfill accumulated as a result of winter 20122013- floods. Three major flash floods occurred in the Petra region in May 2014 that caused the backfilling of the excavation trench a second time.
2. An assessment of the project's current status led to the doubling of the working team in order to overcome the delay in work schedule. The clearance work was executed with two teams, one proceeding from the eastern delimitation of the area towards the axis of the main dam and the other one from the main dam towards the south.
3. The project team began construction of a range of gabions squeezed between the northern and southern cliff of the gorge to serve as a permeable retention dam for sand and rubble that might be swept down by future floods.
4. By September 2014 the project team reached the bedrock level in the eastern and western trenches on the parallel axis of the main dam. The depth achieved varies between -7m to -9m below the main dam crest, and this is a result of the original slope of the bedrock. On the perpendicular axis of the main dam, a total depth of -9m in the narrow section of the retention basin in front of the main dam was achieved.
5. Over the duration of the project 50% of the rubble piled below the western cliff in the wide branch of Wadi Al Jarra has been removed. The displaced materials were moved to a location designated by Park Management.
6. Cleaning, identification and documentation of the ceramic finds was undertaken.

A final comprehensive report will be submitted by PNT to PAP on the project.



Updated site plan showing the exposed bedrock below the western dam and at the eastern cliff. The drawing also shows the extended ranges of gabions at the eastern inlet of Wadi Al Jarra into the retention basin of dam nr. 3. The plan reproduced here is not to scale.

View from the southern cliff onto the upstream face of dam nr. 3 with the narrow section of the retention basin in front (left). Photograph showing the exposed lowest section of the upstream face of dam nr. 3 with its very well preserved original plaster (right).

View from the top of the gabions onto the eastern elevation of the western dam and the maintenance stairs leading down to the bottom of the retention basin

3 Other Developments of Relevance to the World Heritage Committee

3. Other Developments of Relevance to the World Heritage Committee

3.1 Summary

In accordance with the revised Operational Guidelines for the Implementation of the World Heritage Convention, (specifically paragraph 172), through the World Heritage Centre and representative UNESCO staff, PDTRA and DOA have informed the World Heritage Committee of all intentions to undertake restorations or new constructions and interventions.

As described in previous sections of this State of Conservation Report, there have been several important, recent initiatives aimed at conservation, planning, tourism management and archaeological research. The following itemizes the PDTRA collaborative intiatives that, although contribute to the general safeguarding and maintenance of the site, have not been included as a reference in the core conservation program (Sections 1 and 2 of this Report).

PAP staff has taken the lead in continuous communication with stakeholders, including the UNESCO Office in Amman and the World Heritage Center staff, on all of these initiatives. Staff of the UNESCO Office in Amman is engaged and participate as a part of the Petra Advisory Committee, as well as serving on Technical Task Force committees for specific projects.

3.2 Back Road Rehabilitation

After concluding a few years of detailed studies in close coordination with the WHC, the State Party addressed a crucial requirement of the WHC, rectifying the culvert design near the Turkmaniya Tomb. The State Party will proceed in launching the road rehabilitation works. A letter to this effect was sent to the WHC on July 03, 2014.

3.3 Care for Petra Campaign

To tackle some of the major challenges to the visitor experience and improve the conditions and welfare of working animals, reduce child labor and prevent further damage to the archaeological site, a campaign was designed to raise awareness and foster responsible attitudes, behaviors, initiatives and actions from tourists, the tourism industry, Park authorities, governmental bodies and other key stakeholders. A campaign taskforce led by PAP consisted of national and international organizations that collaborated to address three core issues. The "Care for Petra: Children, Animals, Heritage" campaign was developed with the support of Bait Al Anbat, the Brooke, the International Labour Organization, the Jordan Tourism Board, the Jordan Tour Guides Association, the Petra National Trust, Save the Children, SPANA-Jordan, UNESCO Amman and the USAID Economic Growth Through Sustainable Tourism Project. A range of campaign communications materials, such as flyers, banners, an animation, and activities were developed and distributed to raise awareness, inform and recruit active support.

3.4 Petra Museum

"… ICOMOS charters stress on the importance of public communication as an essential part of the larger conservation process (variously describing it as "dissemination", "popularization", "presentation", and "interpretation")…"

In spite of its rich history and its status as Jordan's number one destination, the PDTRA still lacks proper tools to communicate its significance to the public in a form of a full-fledged museum facility. To address this, the PDTRA secured a grant from JICA to build a museum in the vicinity of the Visitor Center. The grant was approved by the Government of Jordan in 2012. The PDTRA in 2013 concluded needed preliminary studies including an Environmental Impact Assessment, Heritage Impact Assessment, Archaeological Survey, and a Traffic Circulation Assessment. All studies were shared with the WHC, and the latter's feedback and recommendations were incorporated. Currently the building design is being developed and it is expected to be tendered out for construction by mid-2015.

3.5 Umm Sayhoun Local Development Center

With a population of 2,300 and residents living in an area of less than two square kilometers, there exist complex social, cultural and health challenges within the village of Umm Sayhoun. The local development center was established in Umm Sayhoun in 2011, as a part of the related PDTRA programs. The objectives of the new Umm Sayhoun Local Development Center are to:

1. *Improve the quality of local village life*
2. *Improve women's social, cultural, health and economic standingin the community*
3. *Improve the conditions, safety and education of children*
4. *Support the local educational institutions to contribute to the upgrading of education, with improvements to literacy rates and a reduction of child labor and school absences / drop outs*
5. *Engage the health, social and cultural care for people with special needs*
6. *Promote awareness for cultural and social initiatives that support the positive change, support development and modernization as well as developing the locals' sense of responsibility towards the protection of the site.*

Priority Initiatives

1. *Develop and implement programs to improve the quality of life for women and their children*
2. *Develop women's strong and positive productivity, to reflect positively on the family situation, and introduce complementary programs and activities that directly impact the children*
3. *Create youth and volunteer programs and activities targeting work for young people that seeks to create a positive influence and increase awareness in their developmental phase*
4. *Develop and provide primary social care services for people with special needs and with disabilities, introducing the development of one or more pillars for their education and care*

APPENDICES

APPENDIX I

Buffer zone

APPENDIX II

Conservation action plan

APPENDIX III

Letter from H.E. Dr. Nidal Qatamine to WHC concerning the back exit road

APPENDIX IV

Guidelines and procedures for archaeological research and excavation activities conducted in PAP