

**FINAL REPORT**  
(October 1<sup>st</sup>, 2014-September 30<sup>th</sup>, 2015)

**ARCHAEOLOGICAL ASSISTANCE TO THE GROUNDWATER  
LOWERING PROJECTS AT KOM EL-SHUQAF A  
AND KOM OMBO**

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Awarded to:

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## I. Executive Summary

Groundwater Lowering (GWL) projects aimed at preserving two important cultural heritage sites by means of extensive engineering works were planned in and around the Kom el-Shuqafa catacombs and Kom Ombo Temple. They are scheduled to begin in early 2016. Both will be funded by USAID and the work supervised by the designing engineers Camp Dresser McKee Smith (CDM Smith). Both sites are well-known cultural heritage assets preserved within archaeological landscapes that will be directly impacted by the implementation of engineering works.

The American Research Center in Egypt (ARCE) was awarded a simplified grant by USAID (Grant No. AID-263-G-14-00002) to provide expert archaeological advice throughout the design of GWL systems between September 2014 and September 2015. ARCE employed four Egyptian archaeologists, graduates of the Ancient Egypt Research Associates (AERA) field school working under the supervision of Freya Sadarangani to carry out research and data collection and analysis that contributed to creating Desk Based Assessments for both sites. The work was carried out in close coordination with the Ministry of Antiquities (MoA) inspectors at both sites. During this period, the archaeological team was in constant communication with CDM Smith so that the engineers could work with archaeological advice to develop designs that would be sensitive to the existence of buried archaeological remains in the project areas. The Desk Based Assessments are two major documents containing all known and accessible records for each site augmented by new data from geophysical investigations carried out specifically to support these engineering works.

An Archaeological Desk-Based Assessment is an important first stage in the planning process, assessing the presence and potential for archaeological remains. Ideally an assessment should be researched and produced in parallel with the creation of specific engineering and development plans as has been done in this case. In doing so potential impacts to archaeological remains can be minimized and strategies developed early on to mitigate damage to the historic environment. The fieldwork and compilation of the written desk-based assessments have been carried out following the standards specified by the Chartered Institute of Field Archaeologists (2014).

CDM Smith outlined five engineering options for the Kom el-Shuqafa Ground Water Lowering Project (options A1, A2, B1, B2 and C). These designs (including CDM Smith's preferred option is Option A1), involve the creation of a below ground level Discharge Pipes (both within and outside of the Kom el-Shuqafa site boundary), the drilling of new wells, and the construction of a control room. All options have the potential to impact on archaeological remains.

CDM Smith's designs for Kom Ombo have been in flux although the concept is clear. The installations proposed include the following: a capillary-break trench, groundwater collection trenches, a discharge force main, pump stations, manholes, relief wells and a control building with substantial foundations. All of these will be cause the destruction of archaeological remains in those parts of the site where they will be located.

In order to assess the potential of the archaeological remains, or heritage assets, within the project areas at both sites a Historic Environment Record, also known as a Sites and Monuments Record, was created for the local areas. A Historic Environment Record locates and provides information on all known heritage assets including archaeological sites, historic sites and buildings, and historic and palaeo-environmental sites within a given area. A Historic Environment Record enables all parties to view the location and types of sites within an area that can then be purposefully avoided during the creation of development and engineering schemes. Also, a Historic Environment Record enables one to predict and extrapolate the likely archaeological conditions within a given area from finds made nearby. This latter analysis is important, as KNOWN archaeological sites and finds are often at best a small and unrepresentative sample of the total buried heritage.

The Historic Environment Records form an important component of the desk based assessments. They were created through research of archaeological, documentary and cartographic sources, as well as through interviews, site observations, geophysical survey and monitoring, recording and interpretation of geotechnical investigations (boreholes and test pits) commissioned and carried out in 2014/2015. During the course of this research thirty-eight heritage assets were identified within and surrounding the site of Kom el-Shuqafa.

At Kom Ombo, the archaeological site was divided into nine zones for the purposes of this assessment. All currently visible archaeological evidence was recorded. In addition, the current state of the site was examined in comparison with the evidence provided by historic documentation in early photographs from c. 1850 onwards, maps, drawings and paintings, and travellers' accounts. Test trenches and borings were carried out for CDM Smith in all nine zones as part of their geophysical investigation of the site. These were monitored and the archaeological findings recorded by the ARCE team.

At Alexandria, research demonstrated that the main Kom el-Shuqafa catacomb and 'Hall of Caracalla' are only two of a number of catacombs that are known to exist or to have existed previously in the vicinity of the Kom el-Shuqafa site. The area was used as an extensive and varied necropolis of catacombs and other types of burial within the Roman Period covering the period from the first century BC to the fifth century AD. The majority of the catacombs were excavated between the middle of the nineteenth century and the early twentieth century, prior to urban expansion that now covers virtually the whole area except for a small Kom el-Shuqafa demarcated heritage site. It is clear, however, that the known catacombs are likely to represent only a sample of the necropolis. Indeed, two further catacombs were found recently, in 2001 and 2014, and two additional cavernous features have been indicated by geophysical survey in 2015. Research carried out under this program has also shown that the western end of a Roman stadium falls within the limits of the Kom el-Shuqafa site.

At Kom Ombo, research based on historic sources and on data from test trenches and borings in each of the nine zones demonstrated that deeply stratified archaeological deposits (to 11.0 m below present ground level in some places) underlie the entire site, that the temple is constructed

on a ground level that overlies earlier archaeological material, and the extent of buried archaeology is likely to be greater than the currently visible, above-ground, remains.

## II. Description of Activities

To accomplish the objectives of the desk-based assessments, ARCE provided an archaeological support team to work closely with CDM Smith, the engineering firm designated by USAID to design and supervise implementation of the groundwater lowering projects, in coordination with the Ministry of Antiquities (MoA), to ensure that archaeological elements are seriously considered during the design phase of engineering works at both sites.

### Data Collection

Research for this report has included the following:

#### *Data Collection (Research):*

The research element of the data collection has included library and archives research, obtaining official archaeological documents, interviews, locating relevant maps and photographs, obtaining previous geotechnical reports, locating previous archaeological archives.

- ***Library and Archives Research***

This part of the data collection was completed early on in the project. As was expected, locating relevant published articles, books, drawings and photographs was not a straightforward task. The team searched for materials at the Archaeological Society of Alexandria, the Bibliotheca Alexandrina, Centre d'Études Alexandrines, the Alexandria Graeco-Roman Museum, the GIS Centre (Zamalek), the Zamalek MoA archives, the ARCE library, and the Internet. Through this research the team compiled a bibliography and took copies of all relevant material. All this material was referenced in the final deliverables, desk-based assessments. Digital copies of these materials are held by ARCE.

- ***Official archaeological reports***

As was expected, locating and accessing official archaeological reports was also not a straightforward task. Completing this task required Permanent Committee approval of the project and security clearances. Once these had been obtained the team was able to access the reports held at the Alexandria and Kom Ombo MoA Inspectorates including reports on the excavation of nearby sites.

- ***Interviews***

The team met frequently with inspectors at the MoA Inspectorates, with past directors of the Graeco-Roman Museum in Alexandria, academics and concession holders. These sources were mostly concentrated in Alexandria since little recent work has been done at Kom Ombo and none is currently ongoing. These meetings and interviews were important for augmenting the official information contained in reports.

- **Maps and photographs**  
The team were able to locate a selection of maps at the Survey of Egypt offices in Alexandria and Cairo and were also able to access a large selection of published maps at various sources. The team were able to locate a large number of historical photographs online, in publications and in other archives.
- **Previous Geotechnical reports**  
CDM Smith provided the archaeological team with the data from previous geotechnical work. The team went through these with an archaeological eye and have integrated the data with those collected by CDM Smith's commissioned geotechnical work of 2014-15. These data are presented in the final deliverables, the desk-based assessments.
- **Locating previous archaeological archives**  
Early on the team identified Giuseppe Botti's, Alan Rowe's and Zieglin's physical archives for Alexandria as potentially containing important archaeological data for the project. Although we contacted various collections worldwide, to date we have not been able to gain access to the Botti archives nor locate the Rowe archives. The most informative archives for Kom Ombo were found to be the photographic and cartographic records from the work of de Morgan and Carter for the early twentieth century and Kemp and the local Kom Ombo Antiquities Inspectorate for the more recent period from the 1960s to present.

#### **Data Collection (geotechnical)**

The ARCE team worked directly with the CDM Smith team during their collection of geotechnical data. They have been present at, and monitored and recorded all geotechnical works.

- **Boreholes.** At Kom el-Shuqafa, CDM Smith bored 9 boreholes in on-site and off-site locations. At Kom Ombo, eight boreholes and two piezometer borings were executed in and around the temple and tell. The ARCE team were present at all times, recording the data (from an archaeological viewpoint) on pro-forma sheets, photographing all the material from the borehole, and collecting and logging any archaeological material that the boreholes produced. Ceramicist Mohammed Naguib studied ceramic material from the boreholes and prepared a report. The ceramics retrieved from borings at Kom el-Shuqafa indicate occupation from the Greco-Roman period (from c. 330 BC) to present. At Kom Ombo a ceramic sequence beginning in the Old Kingdom (c. 2300 BC) was traced through all periods of Egyptian history to late Roman (c. AD 600).
- **Test Pits.** At Kom el-Shuqafa, CDM Smith excavated a test pit off site (TP 10). The ARCE team were present at all times, recording the archaeological data on pro-forma sheets, and photographing the archaeological features. At Kom Ombo, twelve test pits were excavated in and around the standing temple buildings. The ARCE team were present at all times, recording the archaeological data on pro-forma sheets, and photographing the archaeological features.
- **Geophysical Survey.** CDM Smith contracted the Helal Group to conduct two on site geophysical surveys. One was within the main catacombs, and the other across the whole Kom el-Shuqafa site. At Kom Ombo, Helal Group also carried out a geophysical survey

in March 2015. This included the entire up-standing area of the kom and the surroundings. Not surprisingly, the results showed complex anomalies throughout the area surveyed indicating intense archaeological activity.

### ***On Site Data Collection***

Full photographic surveys of the site and nearby sites and the recording and survey of the existing archaeological remains and landscape.

- ***Survey.*** The archaeological team worked with the CDM Smith Surveyors to survey above ground archaeological and topographical features and known sites within the vicinity of both sites. They also worked with the engineers within the Kom el-Shuqafa catacombs although realistically only baseline points could be surveyed. A full catacomb survey would have required a timeframe and level of effort beyond the scope of this project.
- ***Photographic documentation.*** Since there is no full and accessible photographic record of either the Kom el-Shuqafa catacombs and the rest of the site the archaeological team has created one. They have photographed every side of every chamber within the catacombs and are trying to match them with the historical burial numbering systems assigned by Botti, Sieglin and Rowe. The same approach was taken at Kom Ombo where an extensive photographic coverage was carried out to document the site in its present condition.
- ***Recording of Archaeological Features.*** The archaeological team have prepared copious records on the surviving archaeological remains as well as the existing landscape and indications of the historical landscape of the area.

### **Sites and Monuments Record (SMR)/Historic Environment Record (HER)**

Using the data collected from the research data collection, the ARCE team has created an SMR/HER for the Kom el-Shuqafa site and the vicinity. Having started with only two known sites we have now been able to plot 33 sites. All sites have been digitized into AutoCAD, both as the full extent of the sites, overlaid onto modern maps of the area, and as dots coded with their SMR/HER number (Figures 36-37). This number corresponds to a number on an SMR spreadsheet that contains data about the individual sites. We have also digitized the catacombs themselves into AutoCAD and split the various chambers and levels into separate layers so that elements can easily be switched on and off.

### **Collaboration with CDM Smith**

CDM Smith and ARCE have collaborated together during the course of the project with ARCE providing archaeological advice to inform the creation of the ground water lowering engineering designs. This has taken the form of various meetings held in person, by telephone and via Skype. After reviewing CDM Smith's initial engineering designs, ARCE produced an Impact Mitigation Assessment that assessed the individual impacts to archaeological remains. Based on this and subsequent meetings, the designs were modified and alternative engineering designs were developed by CDM Smith. During the course of the project ARCE team members produced

weekly reports that were circulated with CDM Smith detailing progress and results of their research.

### Meetings

- The first introductory meeting was on 17 September 2014 at ARCE’s office in Cairo. In attendance were Thomas Nichols and Mostafa El-Tayeb (CDM Smith), Michael Jones, Essam Shehap, Ahmed Omar (Kom Al-Shuqafa team), Mohammed Abd El-Rahman and Hussein Rekaby (Kom Ombo Team) and Freya Sadarangani by Skype from the UK (ARCE). The objectives of the meeting were to introduce and connect ARCE and CDM Smith team members and to discuss the aims, objectives, deliverables and timetable of the project.
- A meeting was held at the Kom El-Shuqafa site on 13 October 2014. In attendance were Thomas Nichols, Mostafa El-Tayeb and Ashraf Mohammed (CDM Smith), Essam Shehap and Ahmed Omar (ARCE), Abd Al-Aal (Kom El-Shuqafa Director), Hala El-Fawall (Executive Director of the Alexandria Archaeology Department MoA) and engineer Nessrin El-Hennawi (Alexandria Engineering Department). After presenting the project and the timetable to the MoA inspectors all attendees (except Abd Al-Aal) convened to the main MoA Alexandria Inspectorate office to sign a document approving the start of the project.
- A meeting was held on 11 February 2015 to discuss the details of CDM Smith’s proposed pumping test. In attendance were:
  - 1- Thomas Nichos- CDM Smith
  - 2- Mostafa El-Tayeb- CDM Smith
  - 3- Dr. Mohamed Qanswa - CDM Smith
  - 4- Essam Shehab- ARCE
  - 5- Ahmed Omar- ARCE
  - 6- Eng. Waad Allah, the General Director of the Project Sector MoA.
  - 7- Eng. Mohamed Reda, the Director of West Delta Engineering Dep. MoA
  - 8- Eng. Ahmed Reda, Alexandria Engineering Department. MoA
  - 9- Eng. Nesreen El-Hennawi, Alexandria Engineering Department. MoA.
  - 10- Dr. Mohamed Abd El-Hamid, Director of Alexandria Archaeological Sites
  - 11- Hala el-Fawall, Alexandria Antiquities Executive Director.Thomas Nichols explained the process of the pumping test. A debate between the MoA representatives followed revolving around conservation issues and concerns that the existing pumps may be damaged. The head of the MoA Projects Sector decided that a consultant committee of experts from Cairo University should be asked to submit recommendations on the matter.
- A meeting was held on the 14 April 2015 at CDM Smith’s offices in Maadi, Cairo. In attendance was Thomas Nichols, Ahmed Safoh, Moustafa Eltayeb, Mohamed Kansoh (CDM Smith), Michael Jones (ARCE) and Freya Sadarangani by Skype from the UK (ARCE). Attendees discussed the details of proposed ground water lowering designs, considering the archaeological baseline data, in order to minimize the impact on known and potential archaeological remains.



- A meeting was held on the 20 April 2015. In attendance was the head of the Conservation Department of the Centre d'études Alexandrines, Miss Hanaa Mohamed Tawfiq (asked by Michael Jones to represent ARCE), two experts from Cairo University and:
  - 1- Tomas Nichols- CDM Smith
  - 2- Mostafa El-Tayeb- CDM Smith
  - 3- Dr. Mohamed Qanswa - CDM Smith
  - 4- Essam Shehap- ARCE
  - 5- Ahmed Omar- ARCE
  - 6- Engineer Waad Allah, the head of the Project Sector MoA.
  - 7- Dr. Mahmoud Afify, the Head of the Egyptology Sector MoA.
  - 8- Eng. Mohamed Reda, the Director of west Delta Engineering Department. MoA
  - 9- Eng. Ahmed Reda, Alexandria Engineering Department. MoA
  - 10- Eng. Nesreen El-Hennawi, Alexandria Engineering Department. MoA.
  - 11- Dr. Mohamed Abd El-Hamid, Director of Alexandria Archaeological Sites
  - 12- Hala El-Fawwal, Alexandria Executive Director (MoA).

The attendees visited the site and the Catacombs and discussed the process of the pumping test. The experts agreed on some points but disagreed on others.
- A meeting was held on the 23 June 2015 at CDM Smith's offices in Maadi, Cairo. In attendance were Thomas Nichols, Ahmed Safoh, Mostafa El-Tayeb, Mohamed Kansoh (CDM Smith), Michael Jones (ARCE) and Freya Sadarangani (ARCE, by Skype from the UK). Attendees discussed revised proposed groundwater lowering designs.

ANNEXES

ANNEX A: Desk-based Assessment Report for Kom El Shuqafa, Alexandria

ANNEX B: Desk-based Assessment Report for Kom Ombo, Aswan