REPORT ON THE UNESCO ASSESSMENT MISSION TO IRAQ (17TH TO 29TH NOVEMBER 2002) FOR THE EVALUATION OF THE IMPACT OF THE MAKHOOL DAM PROJECT ON THE SITE OF ASHUR AND THE ARCHAEOLOGICAL SITES IN THE RESERVOIR AREA

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1 Introduction

1.1 General situation

Due to the construction of the Makhool Dam some kilometers upstream of where the river Tigris breaks through the mountain chains of Jebel Makhool and Jebel Hamrin, an area of more than 45 km^2 will be inundated by a future reservoir. Accordingly, the dam is aimed at reserving "*more than three billion cubic meters of water which is the minimum requested level for the agricultural and humanitarian use*" (Ministry of Culture 2002: 1). At the time of writing, construction work on the dam is ongoing, and it is planned to flood the area in the first quarter of the year 2006 (Ministry of Culture 2002: 2). The expected flooding level of the reservoir (in order to fulfill the needs indicated above) is c. 156 m above sea level. In the future area of the Makhool Dam reservoir numerous villages, regional roads, undisturbed landscape areas and areas used for agriculture are located. Furthermore there are at least 63 archaeological sites (Ministry of Culture 2002: 3; cf. Shakir 2002b), among which the site of the ancient Assyrian capital Ashur, modern Qal'at Sherqat (**Pl. 1.1**).

In view of the future inundation of the reservoir area, the Iraqi Council of Ministers invited UNESCO for assistance. Apparently, other organisations will be addressed as well (Ministry of culture 2002: 2). The objective of this assistance is to help in the planning and implementation of adequate measures for the protection of the site of Ashur and the excavation of the sites to be flooded. As to the site of Ashur, it is the stated intention of the Ministry of Irrigation to build a retaining wall around Ashur (Ministry of Culture 2002: 3). Furthermore, a total of 2 billion Iraqi Dinars was allocated to the initial needs of salvage excavations in the area. At present excavations are carried out by Iraqi teams on several sites.

In August 2002 the Ministry of Culture issued an executive report on the Makhool Dam project and the archaeological site of Ashur (Ministry of Culture 2002). This report contains information on the archaeological aspect of the project, the extension of the future reservoir and the measures to be taken in consideration for the salvage of the sites and the protection of the site of Ashur. The report recognised :

- The necessity of an international salvage excavation campaign for the archaeological sites (including the site of Ashur) with highly specialised archaeological missions.
- The study of the best engineering means for the construction of a retaining wall for the site of Ashur.

These two aims formed the objectives of the work of the assessment mission of the UNESCO which visited Iraq in November 2002.

1.2 The UNESCO assessment mission

In order to correspond to he request for assistance, an assessment mission of UNESCO visited the Republic of Iraq from November 18 to 28, upon the invitation of the UNESCO National Commission of Iraq. The members of the mission were (**Pl. 2.1**):

Ms. Veronique DAUGE (Amman), UNESCO Culture programme specialist for Iraq and Jordan
Dr Lucio CAVAZZA (Rome), civil engineer and hydrologist
Dr Arnulf HAUSLEITER (Berlin), Near Eastern archaeologist.

With one day delay, the mission arrived in Baghdad on November 18th and left Iraq on November 28th. The visiting programme was designed by the Iraqi National Commission for UNESCO and the State Board of Antiquities and Heritage, Baghdad (SBAH). As to the objectives the mission was divided in three parts:

- Meetings in Baghdad with members of the State Board of Antiquities and Heritage and with the Minister of Education. Preparation of the visit of the salvage area.
- Visit of the site of the Makhool Dam and selected sites in the future reservoir area. Visit to Ashur.
- Evaluation of the situation at the dam and within the salvage area. Meetings with members of the SBAH and with the Minister of Culture.

The site of Hatra which is on the World Heritage List of UNESCO was visited. Other sites which are either in the process of being proposed for the List, such as Ashur, or which have been selected for a nomination (Nimrud, Nineveh, Ukhaidir, Samarra) were visited and studied.

Additional visits were paid to the sites of Tell Harmal and Babylon. Contrary to the initial schedule, the mission worked on November 26th and 27th at the State Board of Antiquities and Heritage in Baghdad.

The members of the mission were constantly accompanied by Dr Donny GEORGE, Director General of the Department of Research and Studies of the SBAH, and by Ms Khama'el HUSSEIN and Mr Louei' AL-UMARI from the Iraqi National Commission of UNESCO.

Meetings were held with the Minister of Education, H.E. Dr Fahad Salim AL-SHAGRA at the beginning of the mission, and with the Minister of Culture, H.E. Mr Hamed Yussuf HAMMADI, at the end of the mission.

Several meetings and discussions took place with the Chairman of the State Board of Antiquities and Heritage, Dr Jaber Khalil IBRAHIM who also accompanied the mission during its visit of Ashur. The archaeological director of the Makhool Dam salvage project, Mr Burhan SHAKIR, accompanied the mission during its visit to the future reservoir area and selected sites. An additional meeting at the SBAH in Baghdad was held with him after the return of the mission from the north. There was, however, no meeting with Dr Hana ABD EL-HALIQ, Director General of Excavation and Archaeological Investigation.

The mission's expert for hydrological questions, Mr CAVAZZA, met with the responsible engineer of the dam project, Mr Khaled ZEIDAN, at the Supervision office near the dam site itself. Another meeting took place in Baghdad with Mr Mazen AL-HASSAN and Mr Salah BEZIRGAN from the Ministry of Irrigation and Al-Furat Company. However, information contributing to the solution of the problems concerning archaeological salvage strategies for the site of Ashur was not given to the mission.

1.3 Objectives of the archaeological part of the mission

Due to the request of assistance and in accordance with the conclusions drawn by the Ministry of Culture in the executive report, UNESCO appointed the present author as archaeological expert. According to the contract, the work assignment for the archaeological expert of the UNESCO assessment mission to Iraq consisted of the following objectives:

(1) To make an assessment of the archaeological areas which will be affected by the construction of the Makhool dam in Iraq, in particular of the site of Ashur.
(2) Present a list of sites, rating their priorities of importance, dimensions etc. affected by the construction of the dam.
(3) Propose possible salvage measures for the preservation of the above sites.

1.4 Working Conditions

The archaeological colleagues of the SBAH were extremely helpful and cooperative during the mission, in particular Dr IBRAHIM, Dr GEORGE and Mr SHAKIR. Their assistance made our stay

very pleasant and certainly contributed to its success. The help and generous welcome from the National Commission was also a great asset.

The meetings with the Minister of Education and the Minister of Culture were characterised by a fruitful discussion about the objectives of the mission and future activities, including those parts of the mission which were not achieved during the visit.

2 Methods and results of the mission

2.1 State of information and methodology of the visits

On November 21st the mission left Baghdad by car in order to visit the area of the Makhool Dam reservoir. After an overnight stay in Mosul, the site of Ashur was visited for one full day on November 22nd.

The reservoir area

According to the available information, there are 61 archaeological sites located in the Makhool Dam reservoir area (Ministry of Culture 2002: 2). The total of these sites is recorded in a report compiled by Mr SHAKIR on behalf of the State Board of Antiquities and Heritage based on visits to the sites and available archaeological information. At the time, the report was available in Arabic. In the meantime, the UNESCO Amman Office had it translated into English. The numbering of the sites in the report is used also in the present document.

During the course of UNESCO mission, two additional sites were discovered in the reservoir area. Thus the total of sites is now 63 (see below). A total of six sites were visited and inspected on November 21st, all of them located in the area east of the Tigris river. These are:

- Tell al-Faras (no. 3)
- Khirbet es-Sin (no. 6)
- Tell Farha (no. 11)
- Tell al-Nol (no. 18)
- Tell Dbes (no. 26)
- Tulul al-Aqr (no. 45)

On three of the visited sites, archaeological excavations by Iraqi expeditions were ongoing (nos. 11, 18 and 45). At one site excavations had been finished (no. 3); two sites were so far unexcavated (nos. 6 and 26). On-site, the field director of the project, Mr SHAKIR, explained the

work and results of the archaeological activities. At some of the sites photographic recording was carried out (slides and digital images). In the excavation house of the SBAH at Medinat al-Zab some ceramic artefacts were observed, in addition to those pottery collections which had been left on the sites. The second expedition house at the village of Sdera was used for a break.

So far, there is a provisional map drawn by the State Board of Antiquities and Heritage indicating the known sites and the extension of the future lake (**Fig. 1**). This map, however, does not show contour lines.

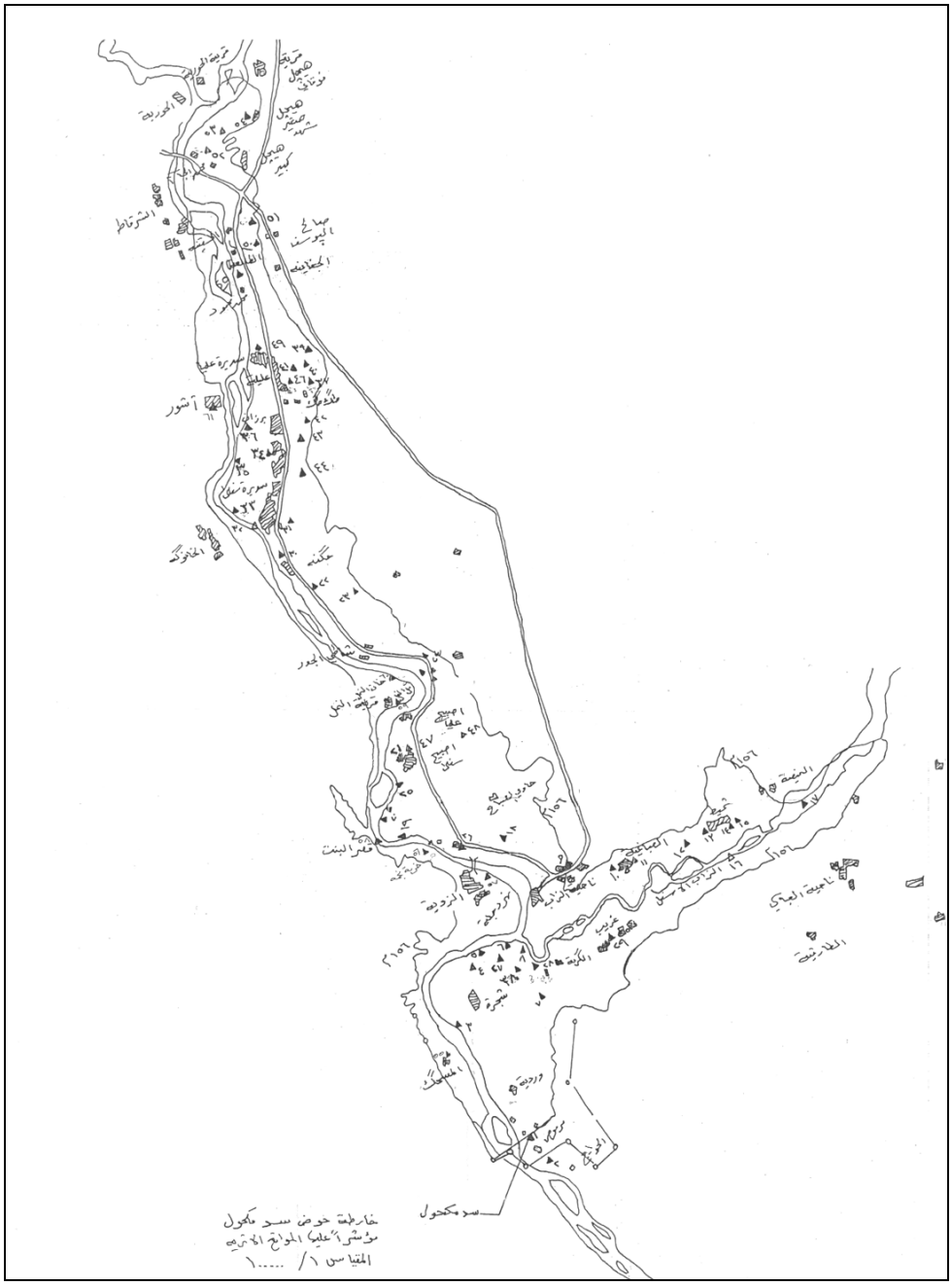

Fig. 1: Map of the Makhool Dam reservoir area
(Source: State Board of Antiquities and Heritage of Iraq)

On the occasion of the Baghdad meeting additional information about all sites presently known in the reservoir area was given, concerning

(1) Period of occupation
(2) Type of remains
(3) Size
(4) State of archaeological exploration
(5) State of preservation

The above-mentioned report of Mr SHAKIR and an area plan of the reservoir indicating the location of 61 sites was handed over to the mission. The SBAH is in possession of a set of high-resolution satellite images of the dam area taken in August 2002, which was provided by the Italian expedition to Iraq. It was, at this point, not possible to study the images in detail. However, it is clear that the quality of the images allows the elaboration of a detailed map of the reservoir area.

The site of Ashur

During the day of November 22nd, the mission stayed at the site of Ashur, modern Qal'at Sherqat (**Pl. 2.2**), the seventh site in the reservoir area visited by the mission (no. 61). In the presence of the Chairman of the SBAH, Dr. IBRAHIM, and Dr GEORGE, Ms HUSSEIN and Mr AL-UMARI, the local field archaeologists explained the ongoing work of the Iraqi salvage expedition, which presently concentrate on four areas in the 'New City'. Further on, several excavation trenches of the regular Iraqi excavations were visited. The same goes for the ziqqurrat, some of those remains excavated by Walter ANDRAE almost 100 years ago, i.e. the public buildings in the north of the city, the Parthian palace and the city wall (the soundings of the present German expedition were briefly visited by the author). Particular attention was paid to the eastern and northern edges of the site. The ancient quay wall towards the river Tigris and the known installations at the northern front of Ashur were not studied. Nor was the area of the New Year's feast building visited, which is located outside of the walled area. About 20 m south of the house of expeditions a benchmark (155,67 m above sea level) indicates the maximum level of the reservoir. Thus, for the first time, there is a fixed point on the site indicating the absolute height (**Pl. 3.1** and **3.2**).

2.2 Assessment of the archaeological areas affected by the reservoir

The area of the future Makhool Dam reservoir belongs to the most important regions of Ancient Mesopotamia in general and of Assyria in particular. With the inundation of the area east of the Jebel Makhool an essential element of human civilisation will disappear forever. The most

famous site threatened by the dam is certainly the first Assyrian capital, Ashur, modern Qal'at Sherqat, which was also the cultic centre of the Assyrian empire. Of *equal importance* is, however, the number of all the other sites which will be covered by the waters of the reservoir and which, except Kar-Tukulti-Ninurta, are smaller than Ashur. The site of Ashur, the other sites and the adjacent landscape of the future reservoir area should be considered together as constituents of the cultural framework of the region (Hausleiter 2002; cf. Lipe 1984: 1).

History of exploration

It is now more than 30 years that regional settlement analysis has changed the archaeological view on Ancient Mesopotamia (Adams 1965; Adams and Nissen 1972). The significant role of the systemic interaction between urban centres and rural settlement clusters contributed to a better understanding of the emergence of states, the economic, social and environmental relations, subsistence patterns and modes of production and trade through time. The question, how the daily life was organised outside the urban context had been addressed for the first time. Between the late 60s of the 20th century and nowadays, a considerable portion of Syro-Mesopotamia has been studied in terms of a regional approach. To a lesser extent this is valid for the Levant, Anatolia and Iran.

It is known, that the region of Ashur was of eminent importance for the history of Northern Mesopotamia long before the Assyrian periods. Thereby, the fact that the first toponomastic definition of the region - *Subartu* / SU.BIR$_4$ - is to be found in sources from South Mesopotamia may have contributed to the scholarly approach towards the entire region, this is from a southern perspective. But this view is changing because of new results from excavations and surveys in North Syria and the archaeological evidence in the future salvage area.

The exploration strategy of European visitors and travellers which was applied from the mid-19th century AD onwards was much different from the present day approach. In Assyria they started to investigate the capitals, i.e. basically the four cities of Ashur, Nimrud, Khorsabad and Nineveh. These cities contained richly adorned temples and palaces. Much of the discovered materials, especially the limestone sculptures and reliefs as well as carved ivories were brought to the Museums in Europe and abroad. A serious interest in areas surrounding the Assyrian capitals Ashur, Nimrud, Khorsabad and Nineveh was not developed at all. As to the area of rural Assyria, fairly late, during the 70s and 80s of the 20th century AD, more information was obtained. A survey which was conducted by the then State Organisation of Antiquities and Heritage near Fatha was published at the beginning of the 70s (Ibrahim 1972). However, most of the investigations concentrated on the provinces rather than on the Assyrian heartland itself. For the area of North Iraq, the North Jezira Project (Wilkinson and Tucker 1995) and the Eski-Mosul / Saddam-Dam project allowed insight to the material remains in the "Ninevite countryside" (cf. Green 1999). Parallel to this archaeological exploration, the (Neo-Assyrian) cuneiform tablets of

the State Archives of Assyria were subsequently edited and studied. Previous work at selected sites outside the core area, such as Tell Khoshi, Tell Rimah or Tell Taya did not lead to an investigation of the sites and their immediate surroundings in terms of an intensive survey.

Since the mid 90s, Iraqi expeditions resumed archaeological activities on sites in the Makhool Dam area, such as, e.g., at Tell al-Naml (no. 59). From 1999 onwards, excavations reopened at Ashur. The Iraqi team has been joined by the German expedition in the year 2000. Since then, Iraqi teams have started excavations at several sites in the reservoir area. At present, Iraqi excavations at the following 12 (16) sites have been completed:

- Tell Marmous 1 and 2
- Tell al-Faras
- al-Ajamiya 2
- Tell al-Zab
- Tell al-Sabaghia Sharqi and Tell al-Sabaghia Gharbi
- al-Ajamiya 1
- Tulul al-Sidr 1 and 2
- Tell al-Hikna Gharbi and Tell al-Hikna Sharqi
- Khirbet Hanas
- Tell Sdera
- Qasr al-Bint
- Tell al-Naml

At the time of the visit of the UNESCO mission, excavations were ongoing at the following 6 (7) sites (from here onwards, excavated sites will be indicated by *italics*):

- *Tell Farha*
- *Tell al-Nol*
- *Tell al-Kawliya 1 and 2*
- *Kh. Jalmoud*
- *Tulul al-Aqr*
- *Ashur*

Excavations are mostly carried out in square areas according to the presence of superimposed archaeological deposits, i.e. layers caused by human activity. Under the general supervision of Mr SHAKIR on behalf of the SBAH, archaeological excavations are locally supervised (and carried out) by specialised technicians. They are assisted by a large number of local workmen from the villages. At Tell Farha, several conveyors were used in order to remove the dump from the excavation trenches. At some sites, such as Kar-Tukulti-Ninurta, specialists for the work with

mudbricks, are employed. Since the time of the first German excavations at Ashur these specialists are called 'Sherqatis' according to their home village, as-Sherqat.

Archaeology and history in the light of recent results

From the periods before the urbanisation of Mesopotamia, such as the Neolithic period, the Hassuna-Samarra complex and the Ubaid periods, there is presently scanty evidence in terms of an overall picture within the region. Only on some sites occupation of these periods seems to be present (nos. *1, 10.b, 39, 46*). A similar result has been obtained for the adjacent Makhmur Plain at the north-eastern periphery of the reservoir area in the late 40s (el-Amin and Mallowan 1949; 1950). So far, evidence for the Late Uruk period comes only from *Tell al-Nol* (no. 18) (**Pl**. **4.1**).

Information increases for the third millennium BC. The first traces of interaction with adjacent areas can be recognised certainly in the worship figures of the Early Dynastic period (c. 2,800 BC) at the site of *Ashur* and in some architectural elements of public buildings. So far, remains of this period could be identified otherwise at *Tell al-Faras* (no. 3), Tell al-Zab (no. 9), Tell al-Ga'ga'iya (no. 21), Tell al-Zawiya (no. 57) and *Tell al-Naml* (no. 59). In al-Faras and Naml, two "round buildings" were discovered which are attested also in the Hamrin area and, to a less similar degree, in the Khabur triangle of Northern Syria. During the period of the empire of Akkad and especially during the period of Ur III (towards the end of the 3rd millennium BC) contacts increased, since *Ashur* was dependent from the Ur III dynasty and had to pay a certain type of taxes. Apparently, a governor ruled over the city. Remains of this period are so far also present at *Tell Marmous* (no. 1) and *Tell al-Faras* (no. 3).

For the first part of the second millennium BC, one focus has been set on the international trading network between the city-state of Ashur and its trading centres in Anatolia, although mainly based on the results from sites in modern Turkey. However, neither the role of Ashur as a "trading platform", nor the function of the smaller sites within the settlement system in the backyard of Ashur had been archaeologically studied. Therefore, it will have to be discussed, whether these sites were involved in the supply of raw material or trading products. Nearby Ashur, there was apparently the residence of the ruler Samsi-Addu (19th/18th century BC) at Ekallatum, the exact location of which is still discussed (Charpin and Durand 1997). After the reign of this king, during a phase of political decline, it was an alliance of Elam and Eshnunna which occupied the area east of the Tigris. According to the textual evidence, several cities, some of them probably in the Makhool Dam reservoir area, were conquered. Whether there are also Old Assyrian remains at *Kar-Tukulti-Ninurta* (no. 45) and at Rassm Hussein al-Abbas (no. 48) will have to be studied further on.

In the mid-2nd millennium, the state of Mittani extended over Northern Mesopotamia. However, what is known about it in this part of Northern Mesopotamia refers exclusively to the site of

Nuzi/Yorghan Tepe near Kirkuk and to the "land of Arrapha", the area south of the Lesser Zab. Apart from archaeological investigations at a limited number of sites, such as Tell Mahuz, information concentrates on historical topography and economic relations within the area. The role of Ashur during this period is still not clear. It was apparently conquered by a Mittanian king but had also an independent king list for this part of the second millennium BC. Recently, layers of this period were uncovered by excavations of the German expedition in the northern part of the city (Hausleiter and Herles 2002).

Results from the survey carried out by Mr SHAKIR seem to indicate a large number of sites with Middle Assyrian settlement remains. North of *Ashur*, the city of *Kar-Tukulti-Ninurta* (no. 45) had been established by the Middle Assyrian king Tukulti-Ninurta I at the end of the 13th century BC. After a short exploration by Bachmann in 1914, a German expedition returned to the site in the mid-80s of the 20th century AD. In addition to the substantial remains from the Middle Assyrian period, evidence for a Neo-Assyrian occupation was identified. Further archaeological investigations at this place will provide insight into the structure of newly founded and "planned" city - this in sharp contrast to the "grown city" of Ashur. The newly excavated palatial building at this site north of the so-called North Palace shows an extremely elaborated decoration of walls and floors (**Pl. 4.2**). Stamped bricks from this building mention the king Tukulti-Ninurta and his palace. Investigations at the so-called Southern Palace seem to indicate that the history of the building is more complex than previously assumed. A highly elaborated facade was discovered at its northern side. A deep sounding at this spot showed that the foundation of this building is much deeper than of the newly discovered palatial building which apparently has been erected immediately on top of the river terrace conglomerate.

The impact of the rise of the Middle Assyrian empire on the immediate surroundings of Ashur and Kar-Tukulti-Ninurta has not been studied - either archaeologically or according to the textual sources. The same is valid for the Neo-Assyrian period.

As to the identification of ancient toponyms with actual sites in the area, textual sources from various periods furnish only a few place names or names of mountain chains. It is, therefore, hardly possible to obtain a precise location of place names mentioned in the texts, whether in the 3rd millennium BC or the 3rd century AD. On the relevant maps the area of the Makhool Dam reservoir remains mainly empty until now. Presently, for this region a map similar to the map of the land Arrapha (see above) cannot be designed (cf. Fadhil 1983; Müller 1994). The work on the Repertoire Geographique des Textes Cuneiformes for the Neo-Assyrian period is ongoing. Published texts from the Neo-Assyrian State Archives of Assyria did not provide substantial improvement so far.

According to the results of the survey of the Iraqi archaeologists, the number of sites with a Neo-Assyrian occupation seems to be surprisingly limited, even though one would expect a similar development for this part of the Assyrian empire as it could be observed for the Western provinces. At Ashur, private and public buildings of this period have been extensively excavated by the Iraqi and German expeditions.

Only after 612 BC the area was controlled by others than Assyrians. In its northern parts, the Medes may have gained control, even though it is not yet clear how to identify traces of them apart from architecture. Traces of Hellenistic, Seleuco-Parthian and Sasanian remains in this particular area still have to be studied thoroughly, since there are only preliminary observations as far as the archaeology is concerned. There are several sites in the reservoir area with remains of these periods, among them the site of *Ashur*. T. al-Fahil, Maqbarat Shajara, Kh. es-Sin (T. al-Khirba), Umm al-Danabiq, *T. al-Zab*, T. Wadi al-Kurdia wa al-Soura, *T. al-Kawliya*, T. Darwish, T. al-Kardoushia, Kh. Tannur, Kh. Haswa, *Kh. Hanas*, *Kh. Jalmoud*, *Qasr al-Bint* and *Khan al-Naml* (for the latter two cf. Dittmann 1995: 87; 90-91).

At the junction of the Lesser Zab and the river Tigris, the extended and marked area of the Islamic city of Khirbet es-Sin (Sin Barme) indicates an important settlement. Apparently, there were several watch towers (no. 27.a-b and no. 38) belonging to this place. Surface sherds cover the Parthian, Sasanian and Islamic periods, but the site may well have had an important function in the pre-Parthian periods, due to its strategic position. The transition from the Late Sasanian to the Early Islamic period is hardly known in terms of archaeological artefacts, and further traces may be expected at sites with traces identified as Sasanian and/or Islamic: T. al-Fahil, Maqbarat Shajara, Umm al-Danabiq, *T. al-Zab*, *T. al-Ajamiya 1*, T. Wadi al-Kurdia wa al-Soura, Kh. A'isha, *Tulul al-Sidr*, Maqbarat al-Atrak, T. Dbes, *T. al-Kawliya*, *T. al-Hikna*, T. al-Kardoushia, T. al-Msaqra, Kh. Tannur, *Kh. Jalmoud*, *Qasr al-Bint* and *Khan al-Naml*.

Attested periods

Since most of the sites have been surveyed and only a minor part excavated a generally valid judgement on the chronology of occupation in the Makhool Dam reservoir area is rather premature (**Fig. 2**). Nevertheless, the attribution to certain periods by means of surface material, mainly pottery, is a well established and useful procedure in order to elaborate a settlement history within a defined region. On the other hand, in this particular area of Mesopotamia the knowledge of the ceramic sequence through time is still rather scanty (see, however, Schmidt 1999 and Hausleiter 1996). At some sites, the archaeological excavations confirmed already the existing dating of a site, in other cases they provided additional information.

Fig. 2: Periods represented at sites in the Makhool Dam reservoir area

A first marked increase of attested occupation can be registered for the Early Dynastic and Akkad / Ur III (?) periods from the mid to the end of the 3rd millennium BC. A significant Old-Assyrian occupation has not been recognised on sites in the area. It might be too early to judge whether settlement during this period was restricted to urban centres such as, e.g., Ashur, even though admittedly the pottery from this period is rather well identifiable. Doubtless, there is a marked increase during the Middle-Assyrian period. However, the image for this period and the Neo-Assyrian periods is obscured by the fact that on 25 sites an "Assyrian" occupation was identified. Since this term may apply for both, Middle and Neo-Assyrian periods, we decided to allocate the value of 12.5 to each of them. From the North Jazira project it is known that there was a remarkable increase from the Middle to Neo-Assyrian periods (Wilkinson and Tucker 1995: 192, Fig. 50) but this could also refer to the circumstances in this specific area which lies clearly within the zone of rainfed agriculture. In the Parthian period there is no visible decrease in occupation. Less secure is the attribution of pottery to the Sasanian period. Discussing an increasing occupation during the Islamic period one should keep in mind that a differentiation between phases within the "Islamic" period is required in order to obtain a reliable picture.

Whether there is a confirmation for this preliminary graph which allows conclusions on economy, demography, administration and agricultural needs will be analysed after the intensive and extensive research in the area has started.

Size

According to the site report (Shakir 2002a), it is possible to give an approximate size for a total of 42 sites, among them *Ashur*. The size of *Kar-Tukulti-Ninurta* was not indicated but it is by far the largest site of the area. The expedition working at the late 80s at the site showed that the originally estimated size of 62 ha pertains to the inner area of the site. The minimum extension of the site is 240 ha (Dittmann et al. 1990: 165-166).

The graph below (**Fig. 3**) is based on the calculated surface based on the data given in the report. The size may vary from site to site since the individual shape of the mounds was not indicated. For other sites there was the information about the diameter. These sites are not included in the graph for the same reason. It should be underlined that the graph represents only the size of sites as visible on actual surface without further examination. It cannot be compared with those graphs indicating the settlement hierarchy during a given period according to the recorded surface extension.

Fig. 3: Extension of selected sites in the Makhool Dam reservoir area (based on Shakir 2002a)

Apart from the five sites with a very large extension, the majority of recorded sites is of limited extension. After *Kar-Tukulti-Ninurta* follow *Ashur* and Khirbet es-Sin. About 30% smaller is T. Wadi al-Kurdia wa al-Soura with 42.5 ha. At a considerable distance follows T. Haijal Saghir with an extension of 10 ha surface. With Maqbarat Shajara (3.75 ha) the number of medium sized sites starts. It is followed by a cluster of seven sites with an extension of between 2.24 and 3 ha. Already of considerably smaller extension is the site of T. Maqbarat al-Fayadh (1.25 ha) which is followed by five sites of about 1 ha size. Between 1 ha and 0.5 ha there are 8 sites, most of them around of a 0.7 ha surface. Slightly smaller (0.5 ha) is another cluster of 7 sites. A third or a quarter of a hectare is the size of six sites, whereas the smallest sites have an estimated surface of 0.13 ha and 0.04 ha respectively.

State of preservation

According to the report and additional information provided by Mr SHAKIR, only seven sites are considered not damaged by post-depositional activities: Kh. as-Sin (no. 6) with T. Dhahrat Sa'id (no. 27.a-b) and Tell (no. 38), Kh. Hazza' (no. 51) and al-Jaharis (no. 63). The majority of the sites in the Makhool Dam area are reportedly damaged by agricultural activity, irrigation measures, modern housing, cemeteries, removal of earth, erosion or flooding. Four sites are completely destroyed, and it does not seem that any excavation is possible: T. al-Kedish 2 (no. 31), Kh. al-Mashak (no. 55), Kh. Nijma (no. 56) and T. al-Zawiya (no. 57). The state of preservation of some of the site is not recorded, since archaeological excavations were carried out: *T. al-Ajamiya 1* (no. 19), *Tulul al-Sidr 1-2* (no. 24), *T. Sdera* (no. 46), *Qasr al-Bint* (no. 58) and *T. al-Naml* (no. 60). Clandestine / irregular excavation are mentioned for the site of Kh. Haswa (no. 41). In respect to the graph above, it should be noted that the state of preservation and the presence of modern housing on or around archaeological sites may have effects on the estimate of the original size of the occupied area since deposits may have been covered or removed. The site of *Tell al-Nol* is surrounded by cultivated fields which through the years have extensively damaged the margins of the original site. It is possible that under the area of the present fields archaeological deposits of preceding periods are present.

Conclusions and prospects

Although many of the archaeological sites within the Makhool Dam area indicate an Assyrian occupation, it should be underlined that the region next to, i.e. mostly east of the river Tigris, played an important role well before and after the Assyrian periods. Recent excavations contributed considerably to a changing view on the area during the prehistoric periods, and it is expected that future archaeological activities in this area will do this for all the periods present on the sites.

The relevance of the Makhool Dam reservoir area for the archaeology and cultural history of Northern Mesopotamia has been confirmed by the first results from the Iraqi excavations: The presence of Late Uruk period pottery (four lugged jars and so-called bevelled rim bowls) at Tell al-Nol and the occurrence of "Ninevite 5"-pottery together with sherds of the "Scarlet Ware" on the site of Tell al-Naml belong to the most outstanding results obtained so far. Third millennium BC occpuation (Akkad and/or Ur III) is attested at Tell al-Faras, whereas early second millennium remains could be covered by Middle-Assyrian deposits which are attested on numerous sites. A high density of sites from this period would fit into the general framework. Whether the relatively small quantity of Neo-Assyrian sites in the area (Shakir 2002b) has to be explained within the context of the shift of political power to the north or because of the limited agricultural potential of the regions for delivering grain to the Assyrian capitals, will have to be studied in due course. Research on the periods after the fall of the Assyrian empire will help to establish a stable basis for the material culture on a regional scale.

Together with the remains of the "material culture", further cuneiform texts from the sites in the area will shed a new light on the history of the region. So far, the new excavations revealed cuneiform texts from the Middle- and Neo-Assyrian periods at the sites of Tell al-Faras (nA), Tell Farha (mA) and Tulul al-Aqr (mA). They are presently under study or in preparation for publication. During recent years, the results from excavations in provincial Northern Syria exemplified very well both, the impact of "peripheral" regions on the centre (and vice versa) and the scale of regional history within the overall historical view.

Since most of the sites are already damaged by the impact of modern civilisation, immediate action is required also from this point of view.

By means of up-to-date methodology and modern technical equipment, a concentrated analysis of the Makhool Dam area will contribute to a deeper understanding of the Assyrian core area from the Neolithic to the Islamic periods. Such an analysis should include the integrated application of

- archaeological excavations
- intensive analysis of the site's surrounding area
- further systematic on-site survey activities
- off-site survey and excavation activities
- remote sensing techniques

Similar to existing salvage projects in Iraq and elsewhere, such a combined approach helps to intensify the degree of analysis by using different methodologies. Such an approach should, firstly, lead to a better archaeological understanding of the cultural matrix on a local and regional

level. On a supra-regional level the changing role of this particular zone of Northern Mesopotamia concerning its relationship to Babylonia and other adjacent regions to the west, north and east will be analysed. In this context, its function as a bridge and motor for cultural contacts, transfer and exchange will become a further research objective.

2.3 Priority list of endangered sites

The assessment of the archaeological areas affected by the reservoir underlines that the entire area of the future reservoir is of eminent importance for the understanding of Ashur and the Assyrian hinterland. This pertains not only to settled areas on sites but to the entire *archaeological landscape* of the area, that is communication networks between settlements (streets, roads, hollow-ways), patterns of land-use and irrigation, traces of nomads and pastoralists etc. in the known archaeological periods. Therefore, a modern archaeological approach cannot be restricted to the mere excavation of a number of sites. A regional analysis should combine intensive on-site research and extensive off-site analyses likewise. With this in mind the creation of a priority list of endangered sites should not be overestimated. On the other hand, in the prospect of the envisaged flooding of the area, it might also help to set up specific salvage measures for those sites considered as very important.

The priority list of endangered sites given below is based on

- the map of the Makhool Dam reservoir area
- the visit of seven sites in the reservoir area
- the survey report of Mr Shakir containing 61 sites (Shakir 2002a)
- discussion about the sites in the area with Mr SHAKIR in Baghdad (Shakir 2002b)
- information about the time schedule of the flooding and the intended maximum level of the reservoir (c. 156 m)
- archaeological publications

There are 7 sites on the map which are located west of the Tigris. The overwhelming majority of the sites is situated at the eastern side of the river. During the stay of the mission, two additional sites were identified in the reservoir area, and it is expected that other sites will be discovered in due course of the project. At the time of writing, the total of sites is, therefore, 63. Since Tell al-Hawaij (no. 2) is located outside the reservoir area, the total of site is 62.

Several sites consist of two or more units. These are *T. Marmous* (no. 1.a-b), Umm al-Danabiq (no. 8.a-b), T. as-Sabaghiya (no. 10.a-b), *Tulul al-Sidr* (no. 24.a-c [the fourth Tell of this place lies outside the reservoir area]), *T. al-Kawliya* (no. 28.a-b), T. Ghraib (no. 29.a-b), T. Hikna (no. 30.a-b), Kh. Tannur (no. 40.a-d), *Kh. Hanas* wa Hayiss (no. 42. a-b) and T. I'ittan (no. 50).

Three additional Tells are attested for the site of Khan al-Naml (no. 60). In some cases two sites with the same name are already listed as independent entries, such as T. al-Kedish 1 and 2 (no. 14 and 31). In one case, the report mentiones an additional site without number next to a registered site (T. Kh. Azawi, next to no. 35). The city of Kh. es-Sin (and three mounds identified as watch towers [T. Dhahrat Sa'id, no. 27.a-b, and Tell, no. 38] are counted as one entry.

Based on this site count, the theoretical number of sites (tells) in the salvage area is 77. Further research at the spot will change the number of sites and shed light on whether single units belong together or not. Therefore, in order to avoid any confusion, site name and number as given by the SBAH will be used as reference frame throughout this report. When necessary, the single units are counted separately and are given in brackets.

Based on the available information, three categories of priority for sites were established.

- very important: 1
- important: 2
- normal: 3

As criteria for the categories served the extension of the site, periods represented, potential for the local and regional material culture and cultural history, accessibility / visibility of artefacts or architectural remains and location. Some of the sites were not attributed to one of the categories.

Priority List of sites in the Makhool Dam reservoir area			
Category 1: Very important			
No.	**Site Name**	**State of exploration**	**State of preservation**
1.a-b	*T. Marmous*	excavation finished	
6	Kh. es-Sin (T. al-Khirba)	Unexcavated	apparently not damaged
10.b	*T. al-Sabaghia Gharbi*	excavation finished	damaged (agriculture)
18	*T. al-Nol*	excavation ongoing	damaged (agriculture / irrigation)
20	T. Wadi al-Kurdia wa al-Soura	Unexcavated	damaged (agriculture)
21	T. al-Ga'ga'iya	Unexcavated	damaged (cemetery, village, erosion)
39	T. Kh. al-Sawwan	unexcavated	damaged (agriculture)
42.a-b	*Kh. Hanas wa Hayiss*	excavation finished	damaged (agriculture, village)
45	*Tulul al-Aqr*	excavation ongoing	damaged (agriculture, village)
46	*T. Sdera*	excavation finished	
48	Rassm Hussein al-Abbas	unexcavated	damaged (agriculture, cemetery)
54	T. Haijal Saghir (Shahad)	unexcavated	damaged (cemetery)
59	*T. al-Naml*	excavated finished	
60	Khan al-Naml	unexcavated	damaged
61	*Ashur*	excavation ongoing	damaged
Category 2: Important			
No.	**Site Name**	**State of exploration**	**State of preservation**
4	T. al-Fahil	unexcavated	damaged (agriculture, cemetery)
5	Maqbarat Shajara	unexcavated	damaged (cemetery)
7	*al-Ajamiya 2*	excavation finished	slightly damaged
8.a-b	Umm al-Danabiq	unexcavated	damaged (agriculture)

9	*T. al-Zab*	excavation finished	damaged (village)
10.a	*T. al-Sabaghia Sharqi*	excavation finished	damaged (removal)
11	*T. Farha*	excavation ongoing	damaged (agriculture, cemetery)
12	T. al-Sidayer	unexcavated	damaged (agriculture)
13	Maqbarat Shmait	unexcavated	damaged (cemetery)
14	T. al-Kedish 1	unexcavated	damaged (agriculture, cemetery, village)
15	T. al-Khan	unexcavated	damaged (agriculture)
17	T. al-Numaisa	unexcavated	damaged (agriculture)
19	*T. al-Ajamiya 1*	excavation finished	
22	Kh. Turki	unexcavated	damaged (agriculture, removal)
23	Kh. A'isha	unexcavated	damaged (agriculture)
24.a-b	*Tulul al-Sidr*	excavation finished	
24.c	Tulul al-Sidr	unexcavated	damaged (cemetery)
25	Maqbarat al-Atrak	unexcavated	damaged (agriculture, cemetery)
27.a-b	T. Dhahrat Sa'id (to no. 6)	unexcavated	
28.a-b	*T. al-Kawliya*	excavation ongoing	damaged
29.a	T. al-Ghraib 1	unexcavated	damaged (cemetery)
29.b	T. al-Ghraib 2	unexcavated	damaged
30.a-b	*T. Hikna*	excavation finished	damaged (agriculture, cemetery)
31	T. al-Kedish 2	excavation impossible	destroyed (village)
32	T. Qrei'a	unexcavated	damaged (village)
33	T. Umm al-Arabid	unexcavated	damaged (village)
34	T. Darwish	unexcavated	damaged (removal, village)
35	T. Maqbarat al-Fayadh	unexcavated	damaged (cemetery, removal, village)
	T. Kh. Azawi	unexcavated	damaged (village)
36	T. al-Kardoushia	unexcavated	damaged (cemetery, removal)
40.a-d	Kh. Tannur	unexcavated	damaged (agriculture)
41	Kh. Haswa	unexcavated	damaged (agriculture)
44	*Kh. Jalmoud*	excavation ongoing	damaged (agriculture)
47	T. Isbeh al-Sufli	unexcavated	damaged (agriculture, removal, village)
50.a-d	I'ittan	unexcavated	damaged (agriculture)
51	Kh. Hazza'	unexcavated	
52	Kh. al-Hamidiya	unexcavated	damaged (removal, village)
53	Kh. Haijal al-Kabir	unexcavated	damaged (removal, village)
57	T. al-Zawiya	excavation impossible	destroyed (agriculture)
58	*Qasr al-Bint*	excavation finished	
62	Tell al-Agara	unexcavated	damaged
Category 3: Normal			
No.	**Site Name**	**State of exploration**	**State of preservation**
16	T. al-Baidha	unexcavated	damaged (erosion)
26	T. Dbes	unexcavated	damaged (village)
37	T. al-Msaqra	unexcavated	slightly damaged
38	Tell (to no. 6)	unexcavated	
43	Kh. Dalli	unexcavated	damaged (removal, village)
49	T. Saleh al-Dakhil	unexcavated	damaged (removal, village)
55	Kh. al-Mashak	excavation impossible	destroyed (agriculture, removal)
56	Kh. Nijma	excavation impossible	destroyed (removal)
63	Al-Jaharis	unexcavated	

Outside the reservoir area	
No.	**Site Name**
2	al-Hawaij
24.d	Tulul al-Sidr

Discussion

15 (17) sites have been attributed to **category 1** ("very important"). At five of them, the Iraqi teams finished excavations, three sites are being excavated (one of them, *Ashur*, with the

participation of a foreign expedition) and seven of them are unexcavated. Five of them have been visited by the mission, one of them previously by the present author. Most prominent in significance and size are certainly the multi-period site of Qal'at Sherqat/*Ashur* and the city of *Kar-Tukulti-Ninurta*/Tulul al-Aqr for the Middle-Assyrian (and Neo-Assyrian) periods. Khirbet es-Sin is most relevant for the Islamic and pre-Islamic, i.e. Parthian and Sasanian, periods (to this site, at least three watch towers have to be added, which entered the site list as sites of "importance" [nos. 27.a-b and 38]). These are the most extended settlements of the reservoir area. The next site of a considerable extension is Wadi al-Kurdia wa al-Soura, another site with an occupation ranging from the Parthian to Islamic periods with a promising potential. At Ashur itself, numerous texts from Old- to Neo-Assyrian periods have been discovered during the last years. Most recently some 30 tablets were found at the site of Kar-Tukulti-Ninurta.

Significant prehistoric remains are attested from T. Kh. al-Sawwan and *Sdera*. Similar is valid for *T. al-Sabaghia Gharbi*. Traces of the Late Uruk expansion to the north are so far only attested at *Tell al-Nol*, although apparently without the context of a settlement. The mound has been entirely excavated, and additional traces of earlier periods may only be discovered under the surface of those areas presently used for modern agriculture.

Excavations on sites with 'round buildings' have been completed at the impressive Early Dynastic sites of *Tell al-Faras* and *Tell al-Naml* both of them located in the immediate vicinity to the river Tigris. Whereas the first of them offers a pottery sequence from the ED to the Akkadian (Ur III?) period, the latter one yielded also sherds of the 'Ubaid period and a Middle Assyrian graveyard. Apart from their excellently preserved architectural structures, these sites will contribute to the pottery sequence of the region. The same is valid for *Tell Marmous* (1 and 2) with substantial deposits from the 3rd millennium BC. Also the site of Tell al-Ga'ga'iya shows significant remains of the Early Dynastic period. Rassm Hussein al-Abbas is labelled as 'Assyrian' and may reveal remains of the Old Assyrian period. Substantial settlements of the Middle-Assyrian period are attested or are to be expected at *Khirbet Hanas wa Hayiss* and Tell Haijal Saghir. An interesting Parthian complex is registered for the site of Khan al-Naml (cf. Dittmann 1995: 87; 90).

As to **category 2** ("important"), it forms the largest group of sites. 38 (53) sites, including the three presumed watch towers of Khirbet es-Sin. On 7 (10) sites archaeological excavations by Iraqi teams have been finished, 3 (4) sites are currently excavated. A total of 27 (34) sites are unexcavated. Only one of them has been visited by the assessment mission. Although the importance of ancient Near Eastern sites can be defined by their size and height, it is not the only reliable criterion. In fact, the majority of sites range between 0.5 and 1 ha extension, but there are several smaller sites and a number of sites with a surface of 3 ha (see above **Fig. 3**). If there is the impression that many of the sites in this category apparently belong only or mostly to the

Middle-Assyrian period, one should take into consideration that, especially at smaller sites close to fields, villages, roads and irrigation measures or covered by modern housing or modern cemeteries, a greater percentage of the substance is either damaged, destroyed or inaccessible. Thus, the substantial presence of Middle-Assyrian remains may have covered (and may still cover) remains of preceding periods. In this respect, the example of *Tell al-Nol* should be recalled, where Late Uruk period pottery has been discovered during the excavation but not by means of the surface survey. On the other hand, the unique chance to study a number of sites from the Middle-Assyrian region in this particular area and with this density, gives a high individual importance to each of these "smaller" sites.

A general statement on the sites from this group must remain preliminary. At the present state, it seems that occupation does not start earlier than the mid-2nd millennium BC (but this impression may change). Excavations of the Iraqi teams focussed in part on sites with several periods represented: *Tell al-Zab*, *Tell al-Kawliya*, *Tell al-Hikna*, *Khirbet Jalmoud*, *Qasr al-Bint*. The so far unexcavated sites Tell al-Fahil, Maqbarat Shajara, Kh. A'isha, Tell Darwish, Maqbarat al-Atrak, Tell Kardoushia, Khirbet Tannur, Khirbet Haswa and al-Zawiya traces of several periods of occupation are present.

An 'Assyrian' occupation (or sherds) is attested at 31 (37) sites. Among these sites, it was possible to identify a considerable portion of sites as Middle-Assyrian. 14 (16) sites show surface material to be attributed to this specific period, which saw the growth of the Middle-Assyrian empire. Since there is only a few excavated rural sites in Assyria proper from this period, it is expected that excavation of these sites will substantially contribute to the understanding of non-élite settlements. Furthermore, new aspects of site-to-site relations in the Assyrian countryside and the interchange between the rural and urban sites will be discussed based on the material from these sites. The analysis of archaeological remains and textual evidence will have to be treated together.

So far, one Middle-Assyrian text has been discovered at *Tell Farha*, while another tablet of this period comes from at *Tulul al-Sidr*. Whether these sites were all single period sites (at least for the time of the Assyrian occupation) will have to be established by detailed on-site research. Middle- and Neo-Assyrian traces are attested for Tell al-Fahil and Kh. A'isha. Neo-Assyrian remains were identified at Tell Kedish 2. For the (-pre-) Parthian and Sasanian periods, the number of 8 (13) sites is comparably limited. Sasanian and / or Islamic artefacts are present at 10 (16) sites. Only Tell al-Ajamiya 1 and Tulul al-Sidr (no. 24.c) show exclusively Islamic remains.

9 sites are listed in the **category 3** "normal". All of them are unexcavated, at two sites it is considered impossible to carry out excavations. Generally, they are rather small and show an 'Assyrian' occupation. Exceptions are T. Dbes and T. Msaqra ('Assyrian' and Islamic) and Tell

(no. 38) which belongs to the site of Kh. es-Sin. At Kh. Nijma there were no surface finds. Information on sites without recorded surface finds (in the report) was added by Mr SHAKIR

Conclusions

At the end of this priority list, four groups of sites can be recognised

- Substantial multi-period sites with third millennium remains
- Extended cities
- Smaller sites with a limited range of deposits (mainly [Middle-]Assyrian)
- Small single (?) period sites

It is clear that especially those sites listed in the first two groups require the most concentrated effort of fund-raising, exploration strategy, decision-making, equipment, recording methods and man-power. In view of the inundation by the reservoir in the year 2006, it is more than justified to attribute these sites a high priority. However, as stated before, the entire amount of smaller sites forms an indispensable part of the cultural heritage of equal value. If they are classified as "less important" in this list, it pertains mainly to the expected effort for their exploration. Even though at this stage an archaeological ranking of sites in the settlement-system(s) of the reservoir area remains preliminary, the listing will have to serve as a tool for the development of archaeological salvage strategies and their implementation.

2.4 Proposed archaeological salvage measures

The archaeological salvage measures for the site of Ashur and the remaining sites within the Makhool Dam reservoir are proposed based on the information that the flooding of the area will be completed in 2006 as scheduled. This means that for the area and most of the sites ~~there~~ less than four years remain for the archaeological exploration. The degree of archaeological exploration depends partly from the duration of stay of archaeological expeditions to the site.

The Iraqi authorities declared that an international appeal would be launched soon inviting archaeological expeditions and specialists from abroad. Further on, similarly to previous salvage campaigns in the country, infrastructure and equipment for all expeditions involved in the salvage project will be offered. This is in particular

- Housing for the expeditions
- Human working forces and their salary
- Equipment (picks, wheel-barrows, shuffles etc.)

Transportation to, from and within the country, specific equipment and special tools as well as living costs of the team members would have to be raised by the expeditions themselves.

2.4.1 Ashur

Since no definite decision on the specific construction of a retaining system for the archaeological site of Ashur has been made yet, it is not clear which parts of the site and its monuments will be affected by the construction of a retaining wall. Therefore, it is only to a certain degree possible to discuss and develop salvage measures for the site.

Recognising the stated interest of the State Board of Antiquities and Heritage as expressed in the executive report launched in August 2002 and during the time of the mission, it seems, however, that the construction of a retaining wall is the favoured solution. Even though there is the option of a retaining wall to be constructed separated from the site - as soonly to be referred to in semi-academic journals, it seems that a more cost-effective solution on the site itself is presently taken in consideration by the authorities. If such a wall or parts of it are constructed on the site, it cannot be excluded that extended parts of the site at the northern and eastern margins may be damaged by the construction of the wall and its foundations. It is clear that any construction on the site will have consequences for the salvage strategy for the site. This pertains to archaeological exploration techniques and methods as well as to the conservation of monuments or single contexts and their transportation to museums.

Under the present conditions, i.e. the ongoing construction of the Makhool Dam, there are theoretically three options for the site of Ashur.

1) No retaining wall will be constructed. The site will be partly flooded and totally infiltrated from 2006 onwards.
2) A retaining wall will be constructed separated from the site before the flooding starts in spring 2006.
3) A retaining system will be constructed on-site, located on the eastern and northern margins before the flooding starts in spring 2006

On the following pages the possible salvage measures for the site of Ashur will be discussed for each of these options.

(1) Without retaining wall

Although this option is considered merely theoretical, a salvage strategy for the site will be discussed briefly as well. It is definitely the worst-case scenario, because the site and its monuments will be destroyed forever during the coming years. Visits to several archaeological sites affected by flooding and infiltration elsewhere in the Middle East underline that the process of destruction of archaeological sites is proceeding quickly once the waters have arrived, even though it is impossible to predict the time when any archaeological activities will have to come to a definite end. The main factors for the destruction of anthropogenic deposits are the change

of the water level, a growing moisture, the continuing movement of the water towards the remaining structures and deposits, the immediate growth of many sorts of plants and effects of infiltration which together lead to a destabilisation of the entire site.

Without a retaining wall, the site will be partly flooded at its lower parts in the New City (**Fig. 4**), even though the exact area cannot be defined precisely, since none of the available (archaeological) maps is either detailed enough or shows contour lines coinciding with the new benchmark. At its eastern and northern margins the site and its archaeological deposits will be exposed to infiltration at a length of more than 2 km.

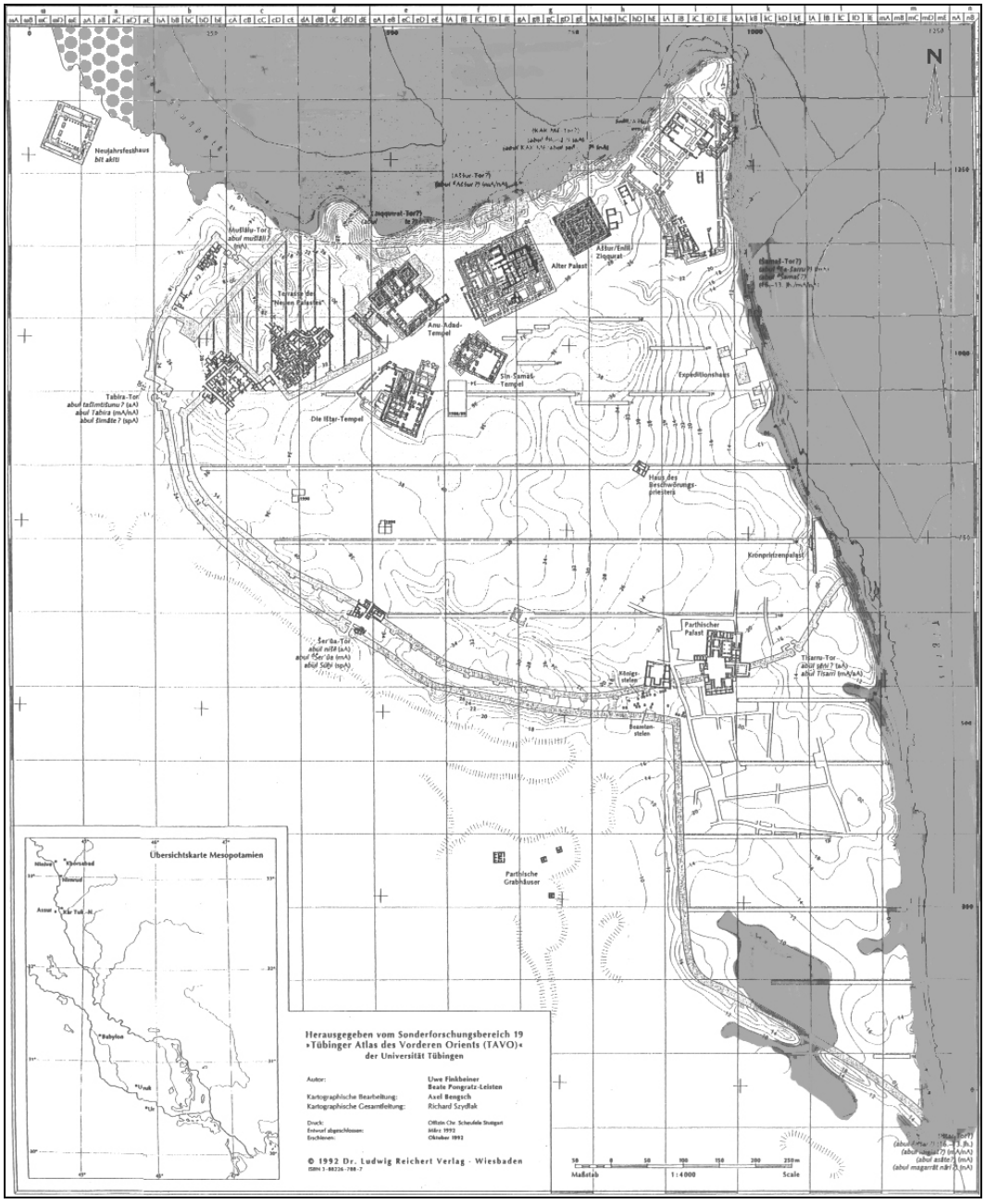

Fig. 4: The site of Ashur and its potentially flooded areas
(Map after Finkbeiner and Pongratz-Leisten 1992)

It must be stressed, that only without a retaining wall, the entire site of Ashur will have to be considered as rescue area. In this case the main technique of exploration will be archaeological excavations combined with any possible remote sensing technique for the study of unexcavated areas on the site and its immediate surroundings. A concentrated rescue operation should cover areas within the city walls and outside, such as, e.g., the area of the New Year's festival building to the NW of the city, but also other zones. Apart from exposing ancient structures and monuments, the thought of conservation and protection should not be abandoned. One should take in consideration the coverage of excavated areas with earth before the areas will be flooded. Objects and contexts of specific importance should be transferred from the site to museums. Restoration and conservation measures pertain exclusively to objects removed from their context.

Finally, a careful and systematic study of the slow decay of the archaeological site of Ashur should be taken in consideration in order to get a better understanding of the disappearance of archaeological sites.

The proposed action plan for scenario (1) is schematically designed in the following table.

Time schedule and working programme for rescue excavations at Ashur (without retaining wall)

Year	Measure	Location / task
2003	Archaeological excavation	Southern city; Quay along the Tigris river
	Geophysical Survey	Unexcavated areas in the Southern city and beyond
	Surface Survey	Outside the city wall (South) and the New Year´s festival building area
	Record	Modern recording techniques parallel to excavations: CAD drawings, kite and aerial photographs; geomorphology; scientific analysis
	Restoration and conservation	Selected objects and contexts
	Publication	Preliminary reports
2004	Archaeological excavation	Southern city, Quay along the Tigris river, eastern part of the Northern city
	Geophysical Survey	Unexcavated areas in the Southern city and beyond (optional: New Year's festival building area)
	Surface Survey	Outside the city wall (South, West, North)
	Record	Modern recording techniques parallel to excavations: CAD drawings, kite and aerial photographs; geomorphology; scientific analysis
	Restoration and conservation	Selected objects and contexts
	Publication	Preliminary reports
2005	Archaeological excavation	Southern city, Quay along the Tigris river, eastern part of the Northern city, Northern city
	Geophysical Survey	Unexcavated areas in the city
	Record	Modern recording techniques parallel to excavations: CAD drawings, kite and aerial photographs; geomorphology; scientific analysis
	Restoration and conservation	Selected objects and contexts
	Publication	Preliminary reports

2006	Archaeological excavation Geophysical Survey Record Restoration and conservation Protection Publication	Southern city, eastern part of the Northern city, Northern city Unexcavated areas in the city Modern recording techniques parallel to excavations: CAD drawings, kite and aerial photographs; geomorphology; scientific analysis Selected objects and contexts: transfer of ensembles to museums Coverage of excavated areas Substantial excavation report/s
	Review phase Evaluation of the activities Discussion of further research strategies Systematic observation of the impact of infiltration and flooding on the site Decision making	
2007-2010	Archaeological excavations Geophysical survey Record Publication	Northern city Unexcavated areas Modern recording techniques parallel to excavations: CAD drawings, kite and aerial photographs; geomorphology; scientific analysis Annual preliminary reports
2010	*Review phase* Evaluation of the activities Discussion of further research strategies Decision making	
2010 -	Archaeological exploration according to a specifically designed strategy (to be developed)	Central parts of the Northern city

(2) With a retaining wall separated from the site

If a protecting system is constructed entirely separated from the site, archaeological exploration of the site and the adjacent areas should concentrate only on those areas accessible which will be affected by the construction of such a system. This will be outside the city walls. In this case, the site of Ashur itself will not have to be object of rescue excavations, and resources should be fully concentrated on the salvage of the other sites in the Makhool reservoir area. Nevertheless, it will be necessary to develop an operational strategy for the future years. Regarding the possible inscription of the site of Ashur and its buffer zone to the World Heritage List of UNESCO the scenario (2) will allow the maximum range of activities and measures to be applied within the process of inscription and future maintenance (cf., e.g., Cleere ed. 1984).

Methods for the study of archaeological data should concentrate on survey, geophysical prospection and archaeological excavation. A surface survey at the southern and northern periphery of the site should be accompanied by geophysical prospection since the question, whether there was any settlement, industrial quarters or a graveyard in the immediate vicinity of the site has never been studied adequately. A geophysical prospection should be adopted in any case in the area of the New Year's festival house which a hundred years ago had been studied by means of excavation at the spot itself (before, investigations into the exact location of this particular building have to be carried out since it cannot be excluded that the modern road covers

the ancient remains). Archaeological excavations should be carried out in areas with anomalies or concentration of surface finds. Within the city walls, there will be no need of enhanced salvage measures as far as archaeological excavation is concerned.

If the here discussed solution is adopted, the efforts should concentrate on the development of conservation measures - independently of the inscription process to the WHL. For restoration activities a similar strategy will have to developped - both in close cooperation with the SBAH.

(3) With a *retaining wall at the margins of the site*

On the occasion of the visit to the site of Ashur and during meetings with H.E. the Minister of Culture, the Chairman of the SBAH and the Director General of Research and Studies and members of the National Commission, the idea of a cost-effective solution for the protection of the site of Ashur was brought up. What was discussed on the basis of information provided by Dr CAVAZZA is a retaining system which makes use of the actual topographical situation of those areas of the site which are bordering the lake. These will be the eastern and northern front of Ashur which have, for the most part, a slopy surface. This specific condition seems to be adequate for the use of so-called “gabions”, i.e. cubi of small quarry stones or pebbles hold together by a wire-network. Accordingly, these gabions will be placed on top of each other in a step-like shape. In order to guarantee the impermeability a water-resistant layer made of various materials will be placed underneath them. Before these gabions are installed, a vertical trench will have to be excavated at the bottom of the retaining system. Being filled with concrete, this cut-off wall will prevent the site from a subterranean infiltration. Whereas the northern part of the city could be mostly protected by this gabion-system, in the southern part of the site the present level of the surface may require additional measures. As a working-hypothesis it was discussed to erect upstanding walls, possibly of concrete, with a substantial foundation.

In case a combined retaining system is applied, parts of the site will be destroyed by the preparation of the surface for the impermeable material of the gabion-system and by the erection of supporting measures. Other parts may just be covered by the gabions but remain inaccessible. It is to be expected that a no-excavation zone will have to be defined inside of the gabion-system and the protection walls in order to guarantee the stability of the construction and to avoid any damage. This zone may cover areas which will not be directly affected by the construction itself. If this solution is adopted, it is these comparatively limited parts of the site which will be object of an intensive archaeological rescue operation.

The particular topography of most of the areas requires specific approaches. Certainly, archaeological excavations will be the main method to be applied for the exploration of the affected areas. Geophysical prospections are of equal relevance depending, however, on the

feasibility at the actual spot. At selected areas, such as the Mushlalu at the northern front or the river quay area, stereo-photographs should be taken.

As far as can be judged now, there are three emergency areas:

- North: the area ranging from the Tabira gate and *Außenhaken*-area in the west to the Mushlalu gate complex at the central north until the area of the temple of Ashur in the east.
- East: the quay wall area entire zone bordering the river below the temple of Ashur, possibly extending down to the end of the city wall of the New City in the south.
- East: Those archaeological deposits south of the ravine S of the temple of Ashur down to the southern end of the city which can be reached by open area excavations or step trenches.

It seems that due to the topography of the site, the eastern area will be affected more intensely by a gabion system, since parts of the southern city lie below the reservoir level (c. 156 m above sea level). However, from the archaeologist's point of view it remains difficult to foresee, to which extent archaeological excavations will have impact on the stability of the area which will be used for the gabions and the additional upstanding wall/s.

At the northern front the partly restored Tabira-Gate, the *Außenhaken*-area and the Mushlalu are the known archaeological features which had been recognised by the team of Walter ANDRAE a hundred years ago. Theses structures and the adjacent areas should be re-evaluated and recorded by means of modern equipment. In addition, a careful survey of the remaining northern front should be carried out. This, however, may be hampered by the fact that large quantities of dump from the excavation trenches in the northern city had been thrown just down to the adjacent plain, thus covering parts of the northern front. In the areas of the future no-excavation-zone, a re-examination and additional soundings will have to be carried out, based on the results of the previous excavations in the area, i.e. the zone north of or, partly, between the living quarter, the temple of Anu and Adad, the Old Palace, the Ziqqurrat and the temple of Ashur.

At the lower part of the eastern border of the site the construction of the quay wall is still visible. In this area a thorough re-examination by means of soundings and survey will contribute to obtain a maximum of information. This is also valid for the area south of the excavation house where no quay wall had been recovered so far.

The most difficult and challenging task consists surely in the exploration of those archaeological deposits at the eastern border of the site which so far had been excavated by vertically oriented excavation trenches due to the plateau-like surface of the area. Erosion and clandestine digging

as well as the regular excavations by the Iraqi archaeologists illustrate that there is a substantial accumulation of deposits. So far, the overwhelming part of the excavated buildings is of Parthian date, and it can be expected that they just cover Assyrian remains (**Pl. 5.1**).

The substantial erosion ravines in this area revealed a highly interesting topographical situation: the difference between the ancient river level and the level of the immediately adjacent Assyrian occupation made it necessary to bridge considerable differences in height. This apparently led to the erection of substantial retaining walls by means of quarry-stones which can be seen from the surface (the latter is also valid for some grave chambers which were exposed to erosion or clandestine digging earlier the last century). Before any further excavation a systematic study and recording of the area must be carried out in order to decide on the adequate exploration technique. Since it is does not seem possible to excavate the entire eastern flank within the remaining years by keeping a decent scientific standard, step trenches and selected soundings will have to be placed in those areas which are considered important. Whether a total coverage by means of excavations, soundings or other recording techniques can be applied will have to be decided after the evaluation of this specific area of the site.

The following time schedule, therefore, is a preliminary working proposal, which will have to be followed up and updated in due course.

Time schedule and working programme for rescue excavations at Ashur (with a retaining system combined of gabions and protective walls)

Year	Measure	Location / task
2003	*Evaluation* Survey and surface observations: Feasibility study Information from the construction company Decision making	 Three emergency zones north and east (N-front, quay wall, deposits near to the river) State of planning and information on geomorphology of the site Archaeological exploration, restoration and conservation measures, impact of the implementation of measures required by the inscription rules WHL
	Cleaning operation and recording Archaeological excavation Geophysical Survey Surface Survey Record Restoration and conservation Publication	Known archaeological structures at the northern and eastern front of the site (Tabira-Gate, Mushlalu, quay wall etc.) Selected operations at the northern front (plateau) and at the eastern side (plateau and step-trench) Measurements in selected areas at the northern and eastern margins Areas north of the site and beyond the southern city wall (including the New Year's festival building site) Modern recording techniques parallel to excavations: CAD drawings, kite and aerial photographs; geomorphology; scientific analysis Selected objects and contexts from excavations Preliminary reports
	Exchange of information with the construction company	

2004	Cleaning operation and recording Archaeological excavation Geophysical Survey Surface Survey Record Restoration and conservation Publication	Known archaeological structures at the northern and eastern front of the site Selected operations at the northern front (plateau) and at the eastern side (plateau and step-trench) Measurements in selected areas at the northern and eastern margins Areas north of the site and beyond the southern city wall Modern recording techniques parallel to excavations: CAD drawings, kite and aerial photographs; geomorphology; scientific analysis Selected objects and contexts from excavations Preliminary reports
	Permanent observation and evaluation of the construction process *Exchange of information with the construction company*	
2005	*Permanent observation and evaluation of the construction process* *Exchange of information with the construction company*	
	Cleaning operation and recording Archaeological excavation Geophysical Survey Surface Survey Record Restoration and conservation Publication	Known archaeological structures at the northern and eastern front of the site Selected operations at the northern front (plateau) and at the eastern side (plateau and step-trench) Measurements in selected areas at the northern and eastern margins Areas north of the site and beyond the southern city wall Modern recording techniques parallel to excavations: CAD drawings, kite and aerial photographs; geomorphology; scientific analysis Selected objects and contexts from excavations Preliminary reports
	Review Obtained results Construction process (scheduled to be finished in early 2006) Buffer zone Exploration strategy and further measures (restoration, conservation, transfer of contexts from the site to museums etc.) Implementation of the WHL requirements	
2006	*Permanent observation and evaluation of the construction process* *Exchange of information with the construction company*	
	Cleaning operation and recording Archaeological excavation Geophysical Survey Surface Survey Record Restoration and conservation Protection Publication	Known archaeological structures at the northern and eastern front of the site Selected operations at the northern front (plateau) and at the eastern side (plateau and step-trench/es) Measurements in selected areas at the northern and eastern margins Areas north of the site and beyond the southern city wall Modern recording techniques parallel to excavations: CAD drawings, kite and aerial photographs; geomorphology; scientific analysis Selected objects and contexts from excavations; transfer to museums if desired Coverage of excavated areas Preliminary reports Preparation of a final report about the results in the explored areas
2007-2010	Regular archaeological exploration according to an archaeological strategy for the site	Unexplored areas in the Northern and Southern city

Concluding remarks

It has to be repeated that it is presently not clear which retaining system will be applied for the protection of the site. This may change when the construction company has finished the study of the soil conditions and the stability of the areas where the retaining system will be constructed.

From the archaeological point of view only a system should be adopted which leaves the site of Ashur in its entirety unaffected. However, it is clear that the decision on which retaining system will be constructed at Ashur will be made by the Iraqi authorities, not by archaeologists. In this context, the serious interest of the representatives of the Iraqi government and the State Board of Antiquities and Heritage in protecting the site of Ashur has been recognised and is highly appreciated. Only on this basis was it useful to open a dialogue between all the parties involved. The talks were extremely helpful, and we consider it desirable to continue this exchange.

Much of what is labelled "operational strategy" for the site of Ashur is also connected with the SBAH's application to inscribe Ashur on the UNESCO World Heritage List. Since this issue lies beyond the goal of the present author it was referred to only in a preliminary way (cf. generally Cleere ed. 1984). However, in case of a positive decision of the responsible body, it is considered extremely useful to cooperate on overlapping themes.

As to the implementation of the necessary measures for the site of Ashur and the other sites within the Makhool Dam reservoir area, the establishment of a regional coordination unit should seriously be taken in consideration. Furthermore, the skills and experience of those expeditions already working on the site should be used.

2.4.2 Other sites in the Makhool Dam reservoir area

Whereas for Ashur there exists the possibility of a protection against flooding and infiltration, the other 61 sites will ~~be~~ definitely disappear with the flooding of the Makhool Dam reservoir, which is scheduled for the year 2006 (see **Fig. 1**). In discussing salvage measures for the future reservoir area, it should be kept in mind that the entire region is part of the archaeological heritage, that is the sites and the surrounding area. This fact has been stated already above (see under 2.2) and should be recognised when dealing with the issue of "other sites" in the Makhool Dam reservoir area. According to the present standard of regional analysis, the chapter should preferably be entitled "other sites *and* the Makhool Dam reservoir area".

Aims

The central aim of the study of the sites and the area of the future Makhool Dam reservoir could be described as the salvage of the maximum archaeological information in the entire area by

modern research methods (this includes any scientific study as well as the analysis and translation of cuneiform or other written sources). The following issues are considered of general importance. They can be studied at sites and their immediate surrounding and on a regional level.

Sites and their immediate surroundings

- Topography, layout and size of the settlement
- Social, functional and distributional phenomena
- Economy and subsistence
- Environmental conditions
- Symbolic and religious dimensions
- Material culture
- Chronological indicators
- Irrigation measures
- Site catchment area

Regional analysis

- Topography
- Geomorphology, water courses, soil conditions
- Wild and domesticated forms of plants and animals
- Record of all types of settlements (permanent – temporary, city – hamlet etc.)
- Distribution of settlements
- Study of settlement patterns
- Communication

Methodological approach

An exploration strategy solely based on on-site rescue excavations does not correspond to a modern archaeological methodology. On the other hand, constraints of time, available resources and the large quantity of sites require effective salvage measures. Nevertheless, the idea of creating a more or less equal methodological standard for all the expeditions working in the area should not be rejected.

Before exploring a site and/or the surrounding (catchment) area, the theoretical framework which serves as a starting point for each settlement analysis will have to be discussed. Since many regional studies have been carried out in various areas of the Middle East and elsewhere until now, this will not be a time consuming task. On the methodological level it is a point of main interest whether to conceive a site as the sum of visible deposits, i.e. a Tell, or as an entity which consists of the former settlement and its original (hypothetical) catchment area. Compared to a conventional rescue excavation, the study of an archaeological site and its catchment requires a slightly different approach and the participation of additional specialists. The study of

a settlement and its former surrounding areas will provide us with a different set of data than just remains of architecture, pottery and a chronological sequence – important enough. It will contribute to a better understanding of land use, cultivation and other natural and human-made phenomena, which pertain in a larger sense to the economic conditions in Antiquity. It is the key to the environmental situation which the inhabitants had to face during their life and the impact nature and culture had on each other. Where possible, an approach combining both on-site and off-site research strategies should be applied.

Given the high potential for new results within a limited time, it would help if the given excavation permit for a site in the Makhool Dam reservoir are includes the possibility to carry out off-site research in the immediate vicinity of a site. The individual circumstances of sites will show whether this can be applied in each case.

In addition to this two-fold research method for single sites or site clusters, the idea of an area survey should not be abandoned. There are apparently concrete steps which are undertaken to carry out such a surface reconnaissance on a multi-national level, based on the satellite-image acquired by the Italian expedition. One aim of eminent importance is the elaboration of a contour map of the area which presently is not available otherwise.

Since the methodology of the archaeological approach will differ from site to site, it is difficult to elaborate an individual working programme for each site. However, independently from the individual adopted approach, the following steps are considered as essential, even though some of them will be optional:

(1) Mapping
(2) Acquisition of a satellite image of the site (or a “window” from the satellite image which is with the State Board of Antiquities and Heritage and the Iraqi-Italian Institute)
(3) Systematic survey on-site and off-site
(4) Geophysical prospection (optional)
(5) Drilling
(6) Excavations in open areas or in test trenches: stratigraphy, chronology of the site (pottery/attested periods)
(7) Scientific analysis of botanic and faunal remains
(8) Radiocarbon dates
(9) Study of textual evidence from the site (optional) and about the site and its area (historical topography)
(10) Restoration of objects (optional)
(11) Record in drawings, photographs, slides etc.

(12) Publication

Discussion of site-related strategies

Based on the priority list of endangered sites and, before the assessment of the archaeological areas, it is only possible to give some general outlines. A combination of surface survey operations, large scale open area excavations or specific soundings will be the adequate tool for obtaining the relevant archaeological information of single sites. A surface survey of the Makhool Dam reservoir area will consist of the study and analysis of the satellite image and the visit of large parts of the area by car. Since these steps are complementary they should be carried out parallel to each other.

As expected, the extended sites of *Kar-Tukulti-Ninurta*, Khirbet es-Sin and T. Wadi al-Kurdia wa al-Soura require the application of geophysical survey techniques (in addition to the other methods) right from the beginning onwards, since it is excluded to obtain a coherent picture of the site just by means of excavations. For most of the other accessible sites, it seems that the combined approach of survey and excavation as explained in detail above is adequate, and according to previous experience within salvage excavations, the remaining time permits a substantial study of sites – funding and equipment provided.

Whether it is useful to start with the work on sites near to the dam construction area and then moving further north should be discussed in due course since the flooding might proceed surprisingly fast, once the construction of the dam is finished. Although there is presently no detailed information on the regime of the river Tigris, it is known as a wild river, especially in springtime when the snow is melting in the mountains. As to the survey it is expected that it should be completed before the actual flooding of the reservoir.

A number of sites are presently partly covered by modern housing or cemeteries. At other places, excavations are impossible since the sites have disappeared (nos. 55, 56 and 57) or are entirely covered by modern buildings (no. 31). According to Mr SHAKIR sites with cemeteries require a special permit of the provincial administration before being excavated (such as Maqbarat Shajara, Maqbarat Shmait [visited by the mission], T. al-Ga'ga'iya, Tulul al-Sidr, Maqbarat al-Atrak, T. Dbes [visited], T. Ghraib 1, T. Maqbarat al-Fayadh, T. al-Kardoushia, Kh. al-Hamidiya, Kh. Haijal al-Kabir and T. Haijal Saghir). If excavations are carried out on such sites, unearthened remains of the deceased will have to be buried elsewhere. It is also to be expected that sites with modern settlements will remain occupied until the flooding starts. In these cases, step trenches in selected areas will serve as the minimum tool in order to obtain an overview on the deposits and their stratigraphy. Presently, parts of sites are covered with modern housing at T. al-Kedish 1, T. al-Ga'ga'iya, T. Dbes [visited], T. Qrei'a (cf. Dittmann 1995: 94), T. Umm al-Arabid (cf. ibid.), T. Darwish, T. Maqbarat al-Fayadh, Kh. Hayiss, Kh. Dalli, T. Isbeh al-Sufli, T. Saleh al-Dakhil,

Kh. al-Hamidiya, Kh. Haijal al-Kabir. At T. Dbes and T. Isbeh al-Sufli the mounds were entirely covered with modern settlements and vegetation. The extent to which each of the other sites are covered with modern housing could not be established in detail during the course of the mission. Whether there are undisturbed remains on the surface will have to be studied on the spot. In any case, a careful cooperation between the inhabitants, the local authorities and the State Board of Antiquities and Heritage is required for sites of this kind.

Concluding remarks

It is to be expected that a concentrated rescue campaign in the Makhool Dam reservoir area will enlarge the knowledge about an important area of Iraq. After more than 30 years of experience with and benefit from regional studies in the Middle East, which started in Southern Mesopotamia, it appears convincing that an archaeological analysis of the Makhool Dam region should be embedded in the framework of this approach. The combination of several exploration techniques and specialists from different fields characterises present-day archaeological work. It is hoped that with the support of the Iraqi government and the great experience of the State Board of Antiquities and Heritage of Iraq, an international effort can be made to save the archaeological information of a core area of Assyrian and Mesopotamian civilisation before it is destroyed forever by the water.

3 Recommendations

The following recommendations are based on the results of the visit and the achievements during the UNESCO mission in Iraq. Additional developments and new information may have an impact on some of them, but it is not expected that the overall direction would be affected.

As far as Ashur is concerned, the decision of which retaining system will be employed is of utmost importance. As for the success of the salvage campaign for the other sites, the process of inviting the international archaeological expeditions – and their response - is considered decisive.

It is clear that the Iraqi authorities are seriously concerned by the archaeological heritage in the Makhool Dam reservoir area. The spirit of open discussion and cooperation encountered during the meetings on various levels is a most welcome context for these recommendations.

- (1) In view of the remaining four years for the completion of the rescue operations in the area (2003-2006), we urgently appeal to the State Board of Antiquities and Heritage of Iraq and the Iraqi government to launch an **invitation to archaeological expeditions** on an international level for the **salvage of the archaeological sites and**

landscape of the Makhool Dam reservoir area. Such an invitation is essential for the fundraising process for archaeological missions.

- (2) **UNESCO** should **fully support** this appeal and the international salvage project.

- (3) In agreement with the Iraqi State Board of Antiquities and Heritage, we recommend the establishment **of a regional coordination centre for the archaeological research** in the area. This centre should be located on the eastern side of the Tigris.

- (4) **UNESCO** should **fully support the** establishment **of such a regional centre**. If possible, the necessary measures for the centre should be coordinated within the process of the nomination procedure of the site of Ashur on the WHL of UNESCO and the accompanying request for emergency assistance submitted by the Iraqi Government.

- (5) The archaeological sites of Ashur, the other sites in the future reservoir area and the archaeological landscape are equally important for the research of the cultures and civilisations of this part of Assyria. Therefore, we propose an **integrated approach combining on-site and off-site research in the area**. Methodologically, this approach is based on **archaeological survey strategies, archaeological excavations and scientific methods** of analysis, such as, e.g., palaeoenvironmental studies.

- (6) For current and future archaeological activities in the areas a **detailed topographical map** is required indicating the contour lines, location of all the sites and rivers, communication, natural phenomena, etc. The satellite image provided by the Italian expedition to Iraq and the map of the salvage area produced by the State Board of Antiquities and Heritage serve as necessary tools for such a map.

- (7) A **systematic survey of the area** which has been discussed before is considered as the adequate method in order to guarantee a full coverage of the topographical and archaeological information within the Makhool Dam reservoir area. This survey has to be carried out with high state of the art equipment and technology (GIS, GPS). Accordingly, steps have already been undertaken to initiate such a survey.

- (8) The **archaeological expeditions** working on the sites should receive a **"window" of the satellite image and the topographical map** representing the individual site in order to be enabled to study phenomena linked to the individual site.

- (9) **Archaeological expeditions should work along the minimum requirement guidelines** presented in this report which have been developed based on the discussions during the visit. These guidelines may further be developed or adapted according to the actual situation.

- (10) As to the archaeological site of **Ashur**, **information** should be provided **on which retaining system will be installed** near or on the site. Only based on this decision, it will be possible to refine the archaeological strategy for the site. In this respect, overlapping issues with the nomination of the site of Ashur for the UNESCO World Heritage List may exist. Coordination is considered necessary.

- (11) In this context, the Iraqi authorities are advised to **evaluate** thoroughly the possibility of a **lower maximum water level of the reservoir**. At present it is c. 156 m above sea level.

- (12) In case a retaining system will be erected near the site of Ashur or on the site itself, a close **cooperation and exchange of useful information between the construction company and archaeologists** involved in the exploration of areas affected by the construction is required.

- (13) An updated **topographical map of the site of Ashur** indicating the **absolute height** above sea level has to be produced in order to make possible a detailed evaluation of the situation of the site.

- (14) The process of archaeological research in the area should be accompanied by **regular meetings of the specialists** involved. In the past meetings of this kind turned out to be extremely fruitful.

- (15) The idea of H.E. the Minister of Culture to hold an **international congress on the research in the Makhool Dam reservoir area** is encouraged. Similar congresses have been held in Iraq on the occasion of other rescue projects in the 70s and 80s but also on the sites of Ashur and Babylon.

- (16) If within its mandate, **UNESCO** should **support** such an event.

- (17) A **media coverag**e respecting scholarly standards is considered welcome.

- (18) After the end of each season, **archaeological expeditions** should be obliged to **deliver a preliminary report** on their work. The **State Board of Antiquities and Heritage** would guarantee the **publication of these reports before the next season**.

Discussion

An **immediate implementation** of the recommendations concerns **paragraphs (1)-(4)**, i.e. the international salvage campaign and steps towards the creation of the regional research centre. After that, the initiation of the work of additional **archaeological expeditions outside Ashur** will be influenced by recommendations (5), (9) and (17), whereas the outcome of recommendations (6), (7), (8), i.e. the **archaeological survey and mapping procedures**, will affect the expeditions in due course. The implementation of **salvage measures for the site of Ashur** (10) depends mainly on the decision on which retaining system will be erected. Information on the water level (11), the regime of the reservoir and the progress of the evaluation of the feasibility of the construction of a retaining wall have their own impact on this decision. Only based on this, a research strategy for the site covering archaeological exploration, restoration and conservation measures as well as the presentation of the remains can be applied (12). The updated topographical map of the site (13) can be produced immediately. The time schedule of accompanying events, such as **meetings and congresses** (14), (15), (16) cannot be predicted. However, the possibility of holding a congress after the first two years of work in the Makhool Dam reservoir area should be taken in consideration. Finally, based on the experience of other salvage projects in the Middle East, the issue of a **regular output of publications** (17) is considered of high importance.

Concluding remarks

Taking in account the atmosphere of cooperation between the State Board of Antiquities and Heritage, the Minister of Culture, the Minister of Education and the members of the UNESCO mission, we have a positive view on the results obtained by the mission. Even though some of the important goals of the mission were not reached this time, it is believed that there is a potential for the fulfilment of the remaining objectives in the near future.

We express our hope that after launching an international campaign for an archaeological salvage project, the international academic community will peacefully work together in the heartland of Assyria. Because the waters of the future reservoir will forever bury cultural heritage, it is the eminent obligation of scientists and specialists to work for the maximum salvation of this heritage. If the international salvage campaign is started, there is a great chance to continue the traditional cooperation between the archaeologists from Iraq and other countries in the world.

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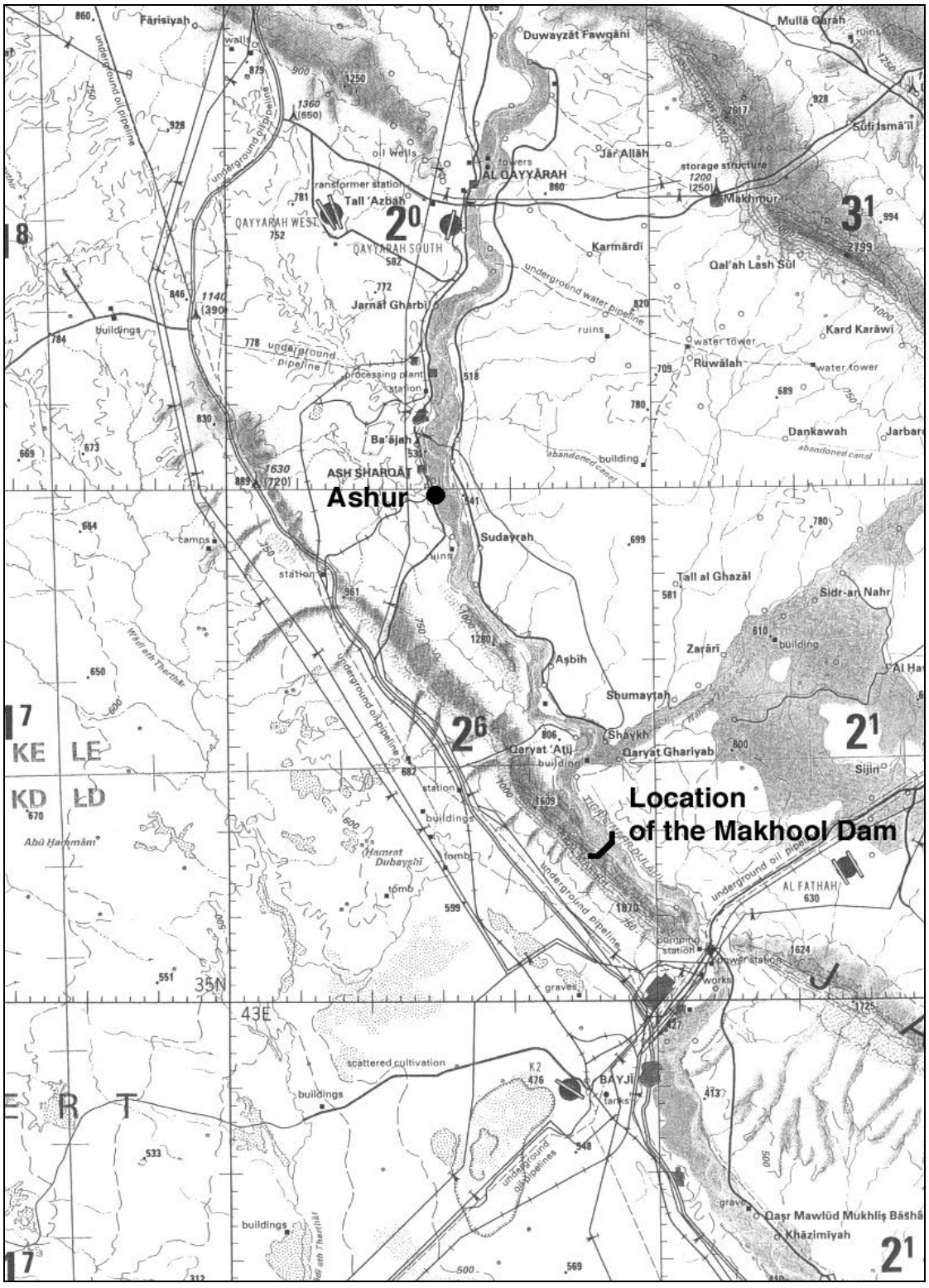


Pl. 1.1: Location of the Makhool Dam and the site of Ashur
(Map after Ministry of Defence UK 1991)

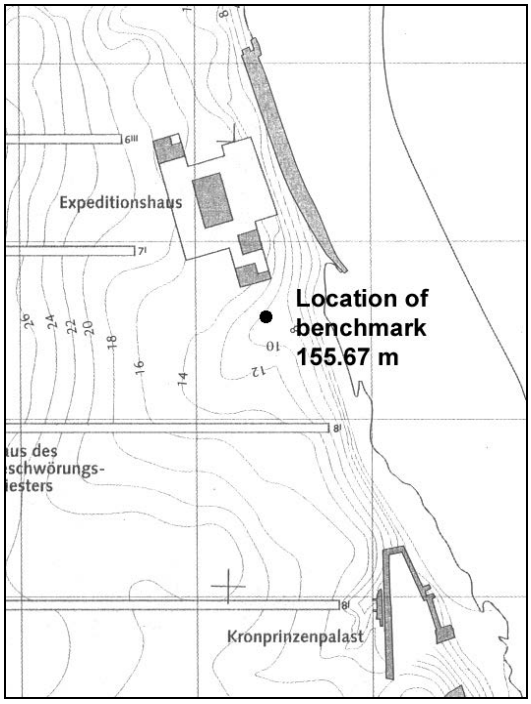
Plate 2

Pl. 2.1: Members of the UNESCO mission to Iraq
(from left to right: Dr Hausleiter, Ms Dauge, Dr George [SBAH], Dr Cavazza)

Pl. 2.2: The site of Ashur towards South
(in front: the former 'cemetery mound' with Iraqi excavation trenches;
in the background to the right: the Jebel Makhool;
to the left: the river Tigris)
(Photograph: A. Hausleiter)

Plate 3

Pl. 3.1: Ashur. Benchmark indicating the maximum flooding level of the Makhool Dam reservoir: 155,67 m above sea level
Location: c. 20 m south of the house of the expedition
(Photograph: A. Hausleiter)



Pl. 3.2: Location of the benchmark
(Map after Finkbeiner and Pongratz-Leisten 1992)

Plate 4

Pl. 4.1: 'Bevelled rim bowls' of the Late Uruk period (end of 4th millennium BC) from Tell al-Nol
(Photograph: A. Hausleiter)

Pl. 4.2: Kar-Tukulti-Ninurta: Palatial building north of the North Palace
(Photograph: A. Hausleiter)

Plate 5

Pl. 5.1: Excavations of the Iraqi expedition at Ashur (New City)
(Photograph: A. Hausleiter)

Republic of IRAQ
Ministry of Culture

EXECUTIVE REPORT
ON MAK'HOUL DAM PROJECT &
THE ARCHAEOLOGICAL SITE OF ASSUR

BAGHDAD
August -2002

EXECUTIVE REPORT
ON MAK'HOUL DAM PROJECT &
THE ARCHAEOLOGICAL SITE OF ASSUR

Iraq has embarked on extensive agricultural and economic development plans , which need constant and well-organized river water flow for growing irrigation ,human and other needs .
Iraq has been facing obstacles in this respect mainly from Turkish non-compliance with international norms to achieve mutual agreements with Iraq and Syria on the water share distribution ,thereby ,restraining the flow of the rivers Tigris and Euphrates into Iraqi and Syrian territories .
A number of dams were planned and built on these rivers , of which the Mak'houl Dam is one of these projects.
This dam is situated across the Tigris far to the south of Assur , to reserve three billion cubic meters of water which is the minimum requested level needed for the agricultural and humanitarian use.

Previous dam projects in Iraq, Egypt, Syria, Turkey, and other countries with ancient cultures and various archaeological sites, different in size or in historical importance, have confronted the same situation of being flooded by dam reservoirs.

Since 1977, Iraq started international salvage excavations in flooding areas of its dam projects, when UNESCO invited the state members to participate. More than seventy foreign expeditions representing the most distinguished institutions and museums from all over the world took part together with forty five Iraqi groups in salvage excavations in more than seven hundred sites . Very important collections of antiquities had been rescued out of them, and many historical and cultural new information up dated the common former chronological image of cultures of the ancient Near East.

The Mak'houl dam is not unlike those dams that have been built in Iraq and the precautions are not deferent than the former similar measures that have been taken through the State Board of Antiquities and Heritage with regard to the wide field experience which have been gained by the Board. The number of the sites that

will be included in the salvage campaign will be sixty-one sites *together with that of Assur.*

It is clear now that the highest level of the flooding will be 156 m. over sea level while the altitude of the city edge looking to the river side is 155.38 above sea level, which is 0.62 m. less than the optimal over *flooding line, while the highest point* registered in Assur is 179.38m. above sea level, which means 23.38 m. higher than the optimal over flooding line.
Despite of all these relatively easing data, the Iraqi Council of Ministers has taken a decision to invite assistance from UNESCO and other international Organizations to help in planning and the implementation of the best means of the site of ASSUR and the excavations of other smaller sites .
The ministries of culture and Irrigation are foresighting the build up of a surrounding wall around the outskirts of the city facing the water seepage or flow.

The council of ministers has allocated more than ID 2 billion to meet the initial needs of salvage excavation. Excavating teams are working in seven sites in this area . The final flooding will be towards the first quarter of 2006.
The salvage works for the sites and Assur, demands the following:

1. Releasing an international salvage excavation campaign were highly specialized archaeological expeditions can take part.
2. The study of the best engineering means for the erecting of the preventive wall between the site of Assur and the waters of the reservoir.

The interests of the Iraqi government in antiquities and its protection s internationally attested. Important archaeological site like Assur, where the archaeological excavations have continued since 1903 and till the recent days, by various German or Iraqi expeditions, and it is worth mentioning that the site is still included in the Iraqi Archaeological Revival Project of Assur since 1980, although the project have been interrupted by the American Imperialist Aggression on Iraq.

TECHNICAL AND SCIENTIFIC NOTES
ON THE CITY OF ASSUR

1. The location of the city of Assur is situated on the western side of river Tigris, and rises 10-16 m. in the northern and eastern edges, and about 30 m. in the middle area (the Ziggurat and Tell Al-Majnna).
2. The site rests on an uneven topographically bedrock beside the river, which is 142.38 m. above sea level, and contains archaeological remains distributed among stratified archaeological levels.
3. There are deferent historical periods represented in the site, starting with the old Sumerian period called Early Dynastic Period (Third Millennium BC.) and even earlier than that, passing through the old Assyrian Period, middle, and the late periods, which end around the middle of the first millennium BC. Then come the Hellenistic and Parthian periods, and the Arab Hatrians dynasty at the late centuries BC.
4. The importance of the city is not only because it was the capital of the Assyrians, and the sacred city that paid no taxes, and the final resting place of some of the great Assyrian kings, but because it had such a deep history and it was an important religious center for the goddess Ishtar starting from the Sumerian first, second, and third early dynastic period (2900-2500 BC.)
5. The city was distinguished for its unique architecture, and it became an example to follow in the coming periods. This architecture was also distinguished, because of its sacredness and for long life as a result of the continuous reconstruction , which were made by kings and rulers until the end of the Assyrian period.
6. It was also distinguished by a special planning system according to the topographical needs of the land, which became later, an Assyrian system for planning their capitals, excluding the geological features of the land.
7. The end of the Assyrian Period did not stop the continuation of life in the city, to have large and important buildings like the Parthian palace, which one of its facades is rebuilt in the museum of the Near East in Berlin.
8. The city is in two parts, the first is called the old city (libbi-ali) (the heart of the city) that is the highest and the biggest part which is surrounded by a double half circle wall. This part contains all the temples of the city, the ziggurats, the palaces of the kings and heires ,and their graves, which are beneath the floors of the old royal palace, and also the general and private houses, and the castles .
9. The modern city (alu-ishshu) (the modern city) that is the lower part of the city (southern) , is surrounded by a part of the city wall, to

become as a narrow tongue alongside the river, this part contained the living houses and some parts of the Parthian palaces.

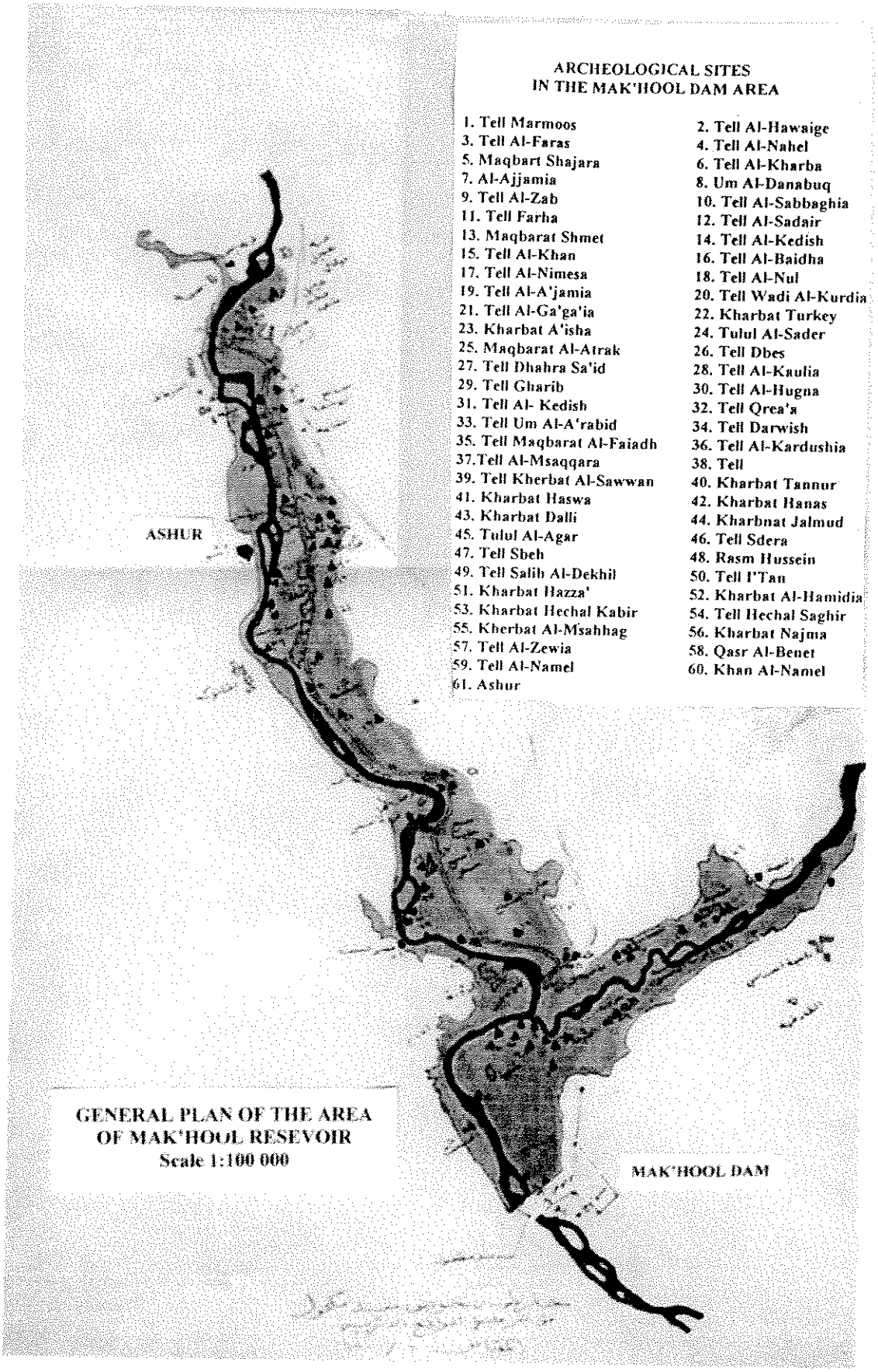
10. The city is surrounded, behind the walls, with a moat, which was left dry until the time of the attacks, and then it was filled with water.

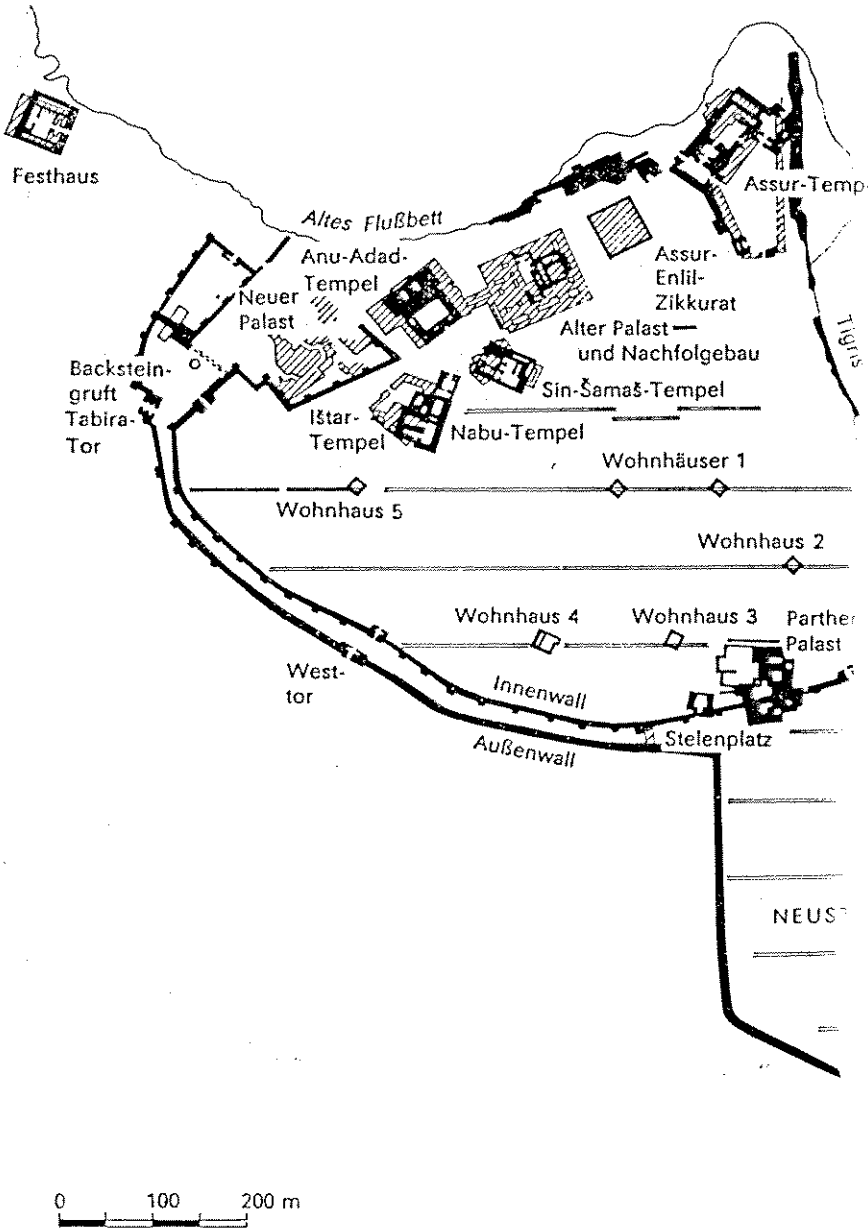
11. The city contains all the temples, except for the (bet-akitu) that was the special temple for the annual festival, and it was built outside of the city walls at the north western corner of the city.

12. The whole city was built with Libin (sun dried bricks) excluding some foundations of palaces that where rocks built.

13. The Germans dug the main ziggurat of the city with a non-scientific system at the beginning of the last century, thinking that it contained a grave like the ones in the pyramids, and not a high temple which was known later by the akkadian name (Ziggurat).

14. The project needed to protect the city, should contain all these architectural facilities inside and outside the city wall, and it should protect the visible antiquities and the ones that are underground now.


ARCHEOLOGICAL SITES
IN THE MAK'HOOL DAM AREA
1. Tell Marmoos
2. Tell Al-Hawaige
3. Tell Al-Faras
4. Tell Al-Nahel
5. Maqbart Shajara
6. Tell Al-Kharba
7. Al-Ajjamia
8. Um Al-Danabuq
9. Tell Al-Zab
10. Tell Al-Sabbaghia
11. Tell Farha
12. Tell Al-Sadair
13. Maqbarat Shmet
14. Tell Al-Kedish
15. Tell Al-Khan
16. Tell Al-Baidha
17. Tell Al-Nimesa
18. Tell Al-Nul
19. Tell Al-A'jamia
20. Tell Wadi Al-Kurdia
21. Tell Al-Ga'ga'ia
22. Kharbat Turkey
23. Kharbat A'isha
24. Tulul Al-Sader
25. Maqbarat Al-Atrak
26. Tell Dbes
27. Tell Dhahra Sa'id
28. Tell Al-Kaulia
29. Tell Gharib
30. Tell Al-Hugna
31. Tell Al- Kedish
32. Tell Qrea'a
33. Tell Um Al-A'rabid
34. Tell Darwish
35. Tell Maqbarat Al-Faiadh
36. Tell Al-Kardushia
37.Tell Al-Msaqqara
38. Tell
39. Tell Kherbat Al-Sawwan
40. Kharbat Tannur
41. Kharbat Haswa
42. Kharbat Hanas
43. Kharbat Dalli
44. Kharbnat Jalmud
45. Tulul Al-Agar
46. Tell Sdera
47. Tell Sbeh
48. Rasm Hussein
49. Tell Salih Al-Dekhil
50. Tell I'Tan
51. Kharbat Hazza'
52. Kharbat Al-Hamidia
53. Kharbat Hechal Kabir
54. Tell Hechal Saghir
55. Kherbat Al-Msahhag
56. Kharbat Najma
57. Tell Al-Zewia
58. Qasr Al-Benet
59. Tell Al-Namel
60. Khan Al-Namel
61. Ashur
ASHUR
MAK'HOOL DAM
GENERAL PLAN OF THE AREA
OF MAK'HOOL RESEVOIR
Scale 1:100 000


Festhaus
Altes Flußbett
Anu-Adad-Tempel
Neuer Palast
Assur-Enlil-Zikkurat
Alter Palast und Nachfolgebau
Assur-Temp
Tigris
Backstein-gruft
Tabira-Tor
Sin-Šamaš-Tempel
Ištar-Tempel
Nabu-Tempel
Wohnhäuser 1
Wohnhaus 5
Wohnhaus 2
Wohnhaus 4
Wohnhaus 3
Parther Palast
West-tor
Innenwall
Außenwall
Stelenplatz
NEUS
0
100
200 m

Annex 2

Report

by

The Iraqi State Board of Antiquities and Heritage

on the

Archaeological Sites in the Makhool Dam Area

Baghdad 2002

(English translation)

Preliminary Data on the Makhool Dam

Background

Preparations commenced few months ago to build a large dam to intercept the Tigris River, located north of Al-Fat'ha, named Sad Makhool (Makhool Dam). The name is derived from "kohl" (mascara). Also known by this name is the mountain which extends between Fat'ha where the highest peak is, to the vicinity of Ashur (Qal'at Sharqat), best known to the inhabitants of the area as al-Khanouka. Within the neighbourhood of this mountain was the city of al-Kuhail, that was referred to in the publications of al-Buldanyin al-Arab *(literally translated).*"

The areas to be flooded will extend from the western heights to the eastern hills. In this area there are a large number of villages scattered along both banks of the river in the Ghurainy plateau. In this location also there are numerous archaeological sites of different sizes and elevations. The sites on the eastern side of these hills are of higher elevation than the sites on the other side of the river which is due to the proximity of the river flow to the Makhool mountains.

Archaeological and Historical Data

The archaeological and historical data on this region depend primarily on information acquired by the excavations of the German Mission in Ashur (Qal'at Sharqat) over eleven years (1903-1914). This was complemented by the excavations of the Department of Antiquities a few years ago in Tell al-Naml (Tell of the Ants).

Most of the findings of the Ashur excavations were published, including the cuneiform inscriptions, constructional remains and artefacts. Several publications were translated from German into Arabic that represents new and important data covering the Assyrian Nation's history and civilisation in the early ages. These investigations moreover gave a clearer picture of the region's economic, political and demographic status during that period.

The Tell al-Naml findings, however, remain unpublished but nevertheless important and have revealed a great deal of important data especially in relation to the Sumerian civilisation during the Early Dynastic period, and in relation to the culture known to specialists as Nineveh V. Although conflicting views exist regarding its origins and the areas to which it spread, the results of the excavations of Tell al-Naml revealed the co-existence of the two civilisations in the Makhool region.

In addition to the information revealed in the excavations of Ashur that consisted of archaeological findings and architectural remains, the information shown in the cuneiform inscriptions refers to a number of other cities and geographical positions that had significant activities in the region in particular in maritime (river) transportation.

Also the other information that published in historical annals was complementary to the information in the cuneiform inscriptions and in particular the news of the lost battle led by Zainaphoun circa 401 B.C. in Asia Minor. The journey referred to a number of locations and cities along the banks of the river Tigris. Amongst these towns was the city of Kanya which the historians differed as to its location. The name of the Zab river, the system of its crossing was referred to. Other information about the region, it reveals the day-to-day life style and animal and vegetal cover.

During the centuries A.D., the region witnessed changes not least of which was the rivalry between the competing empires, when Trojan's armies crossed the river Tigris at Libbi (meaning the heart or the inner city) in 116 A.D., very likely one of the city of Ashur's many appellations in Assyrian. After crossing the river, Trojan followed the riverbank of the river Tigris until he reached the city of Ctesiphon.

During the Arab Islamic era, the Arab Buldanyin offered valuable information on the region, concentrating on the agricultural activities. The information offered by the historian Ibn Jubair; however, when describing the route to Mosul (circa 589 Hijria) is of great value to the researchers of this region in particular.

The descriptive information written by the European historians about the region between the 17th and the beginning of the 20th centuries discloses considerable information on the topographic, demographic and environmental conditions. The more accurate and scientific information, however, came from the German archaeological mission of F. Sarre and E. Herzfeld. They described the archaeological sites located on both banks of the Tigris river. Sites were photographed and drawings of standing archaeological buildings in particular the fortification built on the peaks of the Makhool heights.

We would like to state the following

1. The dam's storage capacity is approximately three billion cubic metres of water.

2. The filling of the reservoir area is dependant upon the water flow from the Tigris River and the two Zab rivers rather than filling in stages.

3. The archaeological surveys conducted and indicated on maps, refer to 61 sites within the area.

4. As for the archaeological site of Ashur, we are in the process of looking into its protection from flooding, by erecting a concrete barrier. A committee from the Iraqi State Board of Antiquities and Heritage has been formed to study this subject and has submitted its preliminary report.

5. The archaeological sites are distributed along both banks of the river Tigris; however, the sites on the western bank are less in number.

6. Works have commenced in three mounds (Tells) that are the closest in proximity to the dam barrier. All building materials belonging to the Ministry of Irrigation's construction companies have been placed adjacent to the site.

Archaeological Sites within the area of Makhool Dam

- **Table # 1**

Site # 1	**TELL MARMOUS**
Village	MARMOUS
Nahiya*	al-ABASSI
Province	HAWIJA
District	18 al-HAWAIJ
Surface	150 x 70 m.
Site Description	Oval shaped Tell located at 7 m above the adjoining plain; has a few recent children's graves. Agricultural land has infringed upon the area from the north western side, and the floods of the Tigris have caused erosion.
Surface Findings	ASSYRIAN SHERDS

*Arabic name for an administrative sub-division

- **Table # 2**

Site # 2	**TELL al-HAWAIJ**
Village	al-HAWAIJ
Nahiya	al-ABASSI
Province	al-HADIJA
District	18 al-HAWAIJ
Surface	3 dunums only remain from the original site (1 dunum = 2,500 m^2.)
Site Description	Located at 6 m. above the adjacent plain, alongside a few inhabited villages. Erosion due to floods is apparent in addition to the removal of earth by the villagers.
Surface Findings	ASSYRIAN POTTERY

- **Table # 3**

Site # 3	**TELL al-FARAS**
Village	SHAJARA
Nahiya	al-ABASSI
Province	al-HAWIJA
District	17A SHAJARA
Surface	110 m.
Site Description	Circular Tell at 7.5 m. above the adjoining plain, alongside of which there are farms and children's graves on the surface, and Ottoman war casualties dating to WW1. The Tell has been subjected to infringements by agriculture from three directions, the north, east and the west. Erosion is apparent a result of continuous floods of the Tigris.
Surface Findings	ASSYRIAN - SUMERIAN EARLY DYNASTIC PERIODS

- **Table # 4**

Site # 4	**TELL al-FAHIL**
Village	SHAJARA
Nahiya	Not specified
Province	al-SHARQAT
District	Not specified
Surface	400 x 70 m.
Site Description	A settlement located to the left of the Tigris, 6 m above the adjacent plain. Agriculture has infringed upon the site; farmers have dug deep trenches, in addition to levelling its surfaces and edges dividing the site into two, north and south. The site has become a graveyard.
Surface Findings	PRE-ISLAMIC AND ISLAMIC POTTERY

- **Table # 5**

Site # 5	**MAQBARAT SHAJARA (SHAJARA CEMETERY)**
Village	SHAJARA
Nahiya	al-ABASSI
Province	al-HAWIJA
District	17A SHAJARA
Surface	15 dunums (1 dunum = 2,500 m^2.)
Site Description	Circular settlement, at 4-5 m above the adjoining land and contains hundreds of graves.
Surface Findings	ISLAMIC - SASSANIAN PERIODS

- **Table # 6**

Site # 6	**TELL al-KHIRBA (KHIRBET AL-SIN)**
Village	SHAJARA
Nahiya	Not specified
Province	al-SHARQAT
District	Not specified
Surface	1 km x 600 m.
Site Description	It is assumed that this is the location of the city Sin, also known popularly by as Sin Barma often referred to by the Arab Buldanyins and other historians. It is located at 500 m north of Shajara village on the left edge of the Tigris and 5 m above the adjacent land. It is of low elevation for the main part and most probably consists of two levels of habitation (built area). It has 5 individual summits that could contain large buildings or more built levels. Farmers from the northern and western boundaries have infringed upon the site from 9 points and that has resulted in exposing the buildings of stone and gypsum or bricks and gypsum There are twin pillars in the northern side of the site.
Surface Findings	PRE-ISLAMIC AND ISLAMIC PLAIN AND GLAZED POTTERY

- **Table # 7**

Site # 7	**al-AJAMIYA**
Village	GHARIB al-AJAMIYA
Nahiya	Al-ABASSI
Province	al-HAWIJA
District	16J GHARIB
Surface	Diameter 70 m.
Site Description	A circular Tell some 5 m above the adjacent land, affected by minor land infringements
Surface Findings	ASSYRIAN POTTERY

- **Table # 8**

Site # 8	**UMM al-DANABIQ**
Village	Not specified
Nahiya	Al-ABASSI
Province	al-HAWIJA
District	17A SHAJARA
Surface	Umm al-Danabiq 1: 100 x 50 m.., Umm al-Danabiq 2: Diameter: 50 m.
Site Description	A settlement comprising of two Tells on the left reservoir of the Zab river. The 1st is oval shaped and 7 m high, the 2nd situated to its north, is circular in shape and is 6 m above the adjoining plain and was most probably one of the settlements that got divided by the agricultural land infringements.
Surface Findings	PARTHIAN AND ISLAMIC POTTERY

- **Table # 9**

Site # 9	**TELL al-ZAB**
Village	Not specified
Nahiya	al-ZAB
Province	al-HAWIJA
District	62B al-SHIK
Surface	100 x 70 m
Site Description	Oval shaped settlement, 12 m above the adjoining land from the northern side, and 20 m. from the southern side. It has houses and a few mud huts.
Surface Findings	ASSYRIAN - SUMERIAN EARLY DYNASTIC PERIODS

- **Table # 10**

Site # 10	**al-SABAGHIA TELLS**
Village	al-SABAGHIA
Nahiya	al-ZAB
Province	al-HAWIJA
District	62B
Surface	Western Tell (al-Gharbi): 50 x 25 m. Eastern Tell (al-Sharqi): 100 x 50 m.
Site Description	Two Tells: The western Tell is located to the west of the village and is considered to have been a large settlement; its eastern part has been totally removed due to transfer of earth. What remains is oval shaped 5 m high. The eastern Tell is at some 150 m from the 1st and is located in the eastern side of the village. It is oval, too, and is 8 m. high and has been affected by agricultural land infringements.
Surface Findings	ASSYRIAN POTTERY

- **Table # 11**

Site # 11	**TELL FARHA**
Village	al-SABAGHIA
Nahiya	Not provided
Province	al-HAWIJA
District	al-ZAB
Surface	180 x 150 m.
Site Description	Located on the north-eastern side of the Sabaghiya village and along the reservoir of the Zab river. It is a large settlement and is 15 m. above the level of the water reservoir and 10-12 m. above the village, the eastern side of which was used as a cemetery. It has been affected by agricultural land infringements on its edges causing damage to it in part.
Surface Findings	ASSYRIAN POTTERY

- **Table # 12**

Site # 12	**TELL al-SIDAYER**
Village	
Nahiya	al-ZAB
Province	al-HAWIJA
District	62B al-SHIK
Surface	100 x 50 m.
Site Description	An oval shaped Tell located to the right of the Zab Minor river and is 4 m. above the level of the river. It has been subjected to infringements for agricultural purposes.
Surface Findings	None

- **Table # 13**

Site # 13	**MAQBARAT SHMAIT (SHMAIT CEMETERY)**
Village	SHMAIT
Nahiya	al-ZAB
Province	al-HAWIJA
District	60J SHMAIT
Surface	40 m. at the base, and 20 m. at the top
Site Description	The cemetery is located to the south of the village on the main road leading to the Zab river. It is circular in shape, in is elevated at 3.5 m. above the level of the River. It is surrounded by elevations of 1-1.5 m. and is used as a cemetery.
Surface Findings	None

- **Table # 14**

Site # 14	**TELL al-KEDISH**
Village	SHMAIT
Nahiya	Not specified
Province	al-SHARQAT
District	Not specified
Surface	Remaining diameter 70 m. Original diameter over 200 x 120 m.
Site Description	A large settlement that was subject to various infringements resulting in its ruin; its edges were levelled to expand the agricultural areas. Its side elevations rise 3 m. from the extension to the west located under the village houses and what remains of graves. That which remains of it is circular in shape at an average height of 6-7 m.
Surface Findings	ASSYRIAN POTTERY

- **Table # 15**

Site # 15	**TELL AL-KHAN**
Village	SHMAIT
Nahiya	Not specified
Province	al-SHARQAT
District	Not specified
Surface	Western: 1 dunum, Eastern: 100 x 70 m.
Site Description	Located at 100 m. north of Tell al-Kedish and was probably a large settlement originally. It was split as a result of the levelling of the area and other infringements. The Khan was divided randomly into two parts. Its extension was eliminated. What remains are two separate peaks. The western peak is irregular in shape. They are 6.5-7 m. high. Recent infringements are noted.
Surface Findings	ASSYRIAN POTTERY

- **Table # 16**

Site # 16	**TELL al-BAIDHA**
Village	al-O'YOUN
Nahiya	al-ABASSI
Province	al-HAWIJA
District	15B JARSHALOO
Surface	2 dunums (1 dunum = 2,500 m^2.)
Site Description	Located on the left side of the Zab river on the eastern side of the reservoir. It is irregular in shape due to erosion and its subjection to continued floods. It is 5 m. high
Surface Findings	None

- **Table # 17**

Site # 17	**TELL al-NUMAISA**
Village	al-NUMAISA
Nahiya	al-ZAB
Province	al-HAWIJA
District	59 al-NUMAISA
Surface	100 x 50 m.
Site Description	It is an oval shaped Tell 4 m. high and is affected by agricultural infringements that have resulted in the levelling of its sides.
Surface Findings	MIDDLE ASSYRIAN POTTERY

- **Table # 18**

Site # 18	**TELL al-NOL**
Village	Not specified.
Nahiya	al-ZAB
Province	al-HAWIJA
District	62A al-SHIK
Surface	70 x 30 m.
Site Description	There are remains of an oblong shaped Tell. It is 3 m. high. A large part of this was levelled for agricultural purposes. A water pump has been installed in the remaining part.
Surface Findings	MIDDLE ASSYRIAN POTTERY

- **Table # 19**

Site # 19	**TELL al-AJAMIYA**
Village	SABIH al-SUFLI (LOWER SABIH)
Nahiya	al-ZAB
Province	al-HAWIJA
District	Not specified
Surface	50 x 50 m.
Site Description	An almost square shaped settlement. It was excavated by the Tell al-Naml mission in 1999. Islamic period buildings were found.
Surface Findings	None

- **Table # 20**

Site # 20	**TELL WADI al-KURDIA WA al-SOURA**
Village	SABIH AL-SUFLI (LOWER SABIH)
Nahiya	al-ZAB
Province	al-HAWIJA
District	63 SABIH VILLAGE
Surface	400-450 m. x 1 km.
Site Description	It is located on the eastern bank of the Tigris. With the exception of some parts that do not exceed 4 m. in height from the surface of the parallel settlement, the remaining parts are low. Irrigation ditches have been burrowed and tracks have been cut to allow circulation of agricultural machinery.
Surface Findings	ISLAMIC AND PRE-ISLAMIC PERIODS

- **Table # 21**

Site # 21	**TELL al-GA'GA'IYA**
Village	SABIH al-SUFLI (LOWER SABIH)
Nahiya	al-ZAB
Province	al-HAWIJA
District	Not specified
Surface	10 dunums (1 dunum = 2,500 m^2.)
Site Description	A large settlement, eroded on the side bordering on the river. It is elevated approx. 20 m above the river and is situated on a rocky bank of the river. Its eastern side is 10-12 m above the surrounding land. It has been used recently as a cemetery and for housing which has caused damaged to its surface. It is classified as one of the important sites in the basin.
Surface Findings	SUMERIAN EARLY DYNASTIC AND ASSYRIAN POTTERY

- **Table # 22**

Site # 22	**KIRBET TURKI**
Village	al-HAKNA
Nahiya	Not specified
Province	al-SHARQAT
District	68 AL-HAKNA
Surface	Diameter 100 m.
Site Description	A small Tell 3-3.5 m higher than the adjoining plain. It is affected by various infringements. Large quantities of earth were transferred to elevate the level of the adjoining road. Its borders have been used for agricultural purposes.
Surface Findings	ASSYRIAN PERIOD

- **Table # 23**

Site # 23	**KHIRBET A'ISHA**
Village	al-HAKNA
Nahiya	Not specified
Province	al-SHARQAT
District	68 al-HAKNA
Surface	Diameter 60 m.
Site Description	A small Tell 2.5-3 m above the adjoining plain. It has been infringed upon agriculture.
Surface Findings	ASSYRIAN AND ISLAMIC SHERDS

- **Table # 24**

Site # 24	**TULUL AL-SIDR**
Village	al-SIDR
Nahiya	al-ZAB
Province	aL-HAWIJA
District	Not specified
Surface	3rd Tell: Diameter: 40 m. 4th Tell: Diameter 45 m.
Site Description	It is located 12 kms to the north west of the Zab river. 4 Tells, two of which to the right of the road were excavated in 1999. There are two small settlements from the middle Assyrian period. The 3rd Tell is to the left of the road at approx. 200 m and is located on the eastern bank of the Tigris. It is a small Tell located opposite the two Tells excavated. It is used as a cemetery and is elevated to 5 m above the riverbank. The 4th Tell is located to the north western side of al-sidir village, located on the left of the main road. I is circular shaped and is 4 m higher than the surrounding plain. its buildings are of brick, stone and gypsum.
Surface Findings	FEW ISLAMIC SHERDS

- **Table # 25**

Site # 25	**MAQBARAT AL-ATRAK**
Village	al-RAWAYIN
Nahiya	al-ZAB
Province	al-HAWIJA
District	62 al-SHIK
Surface	100 x 50 m.
Site Description	It is oval in shape, and is 4 m in height, and stretches to the southern and south eastern side for almost 100 m from the eastern bank of the Tigris. Its extension is around 70 m in width and is elevated above the riverbank by 15-17 m and houses recent graves. The soil has been ploughed for agricultural purposes and for the extension of water pipes to the farms.
Surface Findings	ASSYRIAN AND ISLAMIC POTTERY

- **Table # 26**

Site # 26	**TELL DBES**
Village	N.A.
Nahiya	al-ZAB
Province	al-SHARQAT
District	Not specified
Surface	Note specified
Site Description	A small Tell located to the west of the centre of the Nahiya of al-Zab at 40 kms. over which a new village was recently constructed and given the same name. The presence of this village has caused damage and has distorted the Tell's characteristics rendering it impossible to obtain any indications regarding its origin.
Surface Findings	None

- **Table # 27**

Site # 27	**TELL DHAHRAT SAÏD**
Village	SHAJARA
Nahiya	al-ABASSI
Province	al-HAIJA
District	17A SHAJARA
Surface	1st Tell: 70 x 40 m. 2nd Tell: 65 x 50 m.
Site Description	There are two Tells: the 1st is small and is located to the south of al-Sin city and is 5 m high. The 2nd is located to the south west of the al-Sin city at some 300 m and is 5 m high. It is probably part of al-Sin city.
Surface Findings	PRE-ISLAMIC AND ISLAMIC PERIODS

- **Table # 28**

Site # 28	**TELL AL-KAWLIYA**
Village	N.A.
Nahiya	al-ABASSI
Province	al-HAWIJA
District	17A SHAJARA
Surface	1st Tell: Diameter 50 m.; the 2nd Tell: smaller
Site Description	A settlement consisting of two Tells. The 1st Tell is 4 m high and the 2nd is 2.5 m high. It is most likely that originally there was one Tell which could have been separated by the agricultural infringements.
Surface Findings	PRE-ISLAMIC AND ISLAMIC PERIODS

- **Table # 29**

Site # 29	**TELL GHRAIB**
Village	GHRAIB
Nahiya	al-ABASSI
Province	al-HAWIJA
District	16J GHRAIB
Surface	Not specified
Site Description	There are two Tells; the 1st is located on the Zab river reservoir directly. Its area is 2 dunums and has been used as a cemetery by the villagers. The 2nd is located at 100 m to the east of the 1st and is circular in shape and is 4 m higher than the adjoining land and 10-12 m. from the reservoir. It has been subjected to damage and only 40 m remain of its diameter.
Surface Findings	None

- **Table # 30**

Site # 30	**TELL al-HIKNA**
Village	al-HIKNA
Nahiya	Not specified.
Province	al-SHARQAT
District	68 HIKNA
Surface	Not specified
Site Description	There are two Tells. Both located on the eastern bank of the Tigris. The western one has been excavated. The eastern one, adjacent to the 1st, has been partly excavated and is used as a cemetery by the villagers. the 1st is affected by agricultural infringements.
Surface Findings	Western Tell: MIDDLE ASSYRIAN Eastern Tell: ISLAMIC PERIOD

- **Table # 31**

Site # 31	**TELL al-KEDISH**
Village	SDERA al-SUFLA (LOWER SDERA)
Nahiya	Not provided
Province	al-SHARQAT
District	64
Surface	Diameter: 20 m.
Site Description	Small Tell; 1.5 m high. New houses have been built over it.
Surface Findings	FEW ASSYRIAN SHERDS

- **Table # 32**

Site # 32	**TELL QREI'A**
Village	SDERA al-SUFLA (LOWER SDERA)
Nahiya	Not provided
Province	al-SHARQAT
District	64 SDERA al-SUFLA
Surface	50 x 80 m.
Site Description	It is located on the edge of the reservoir in the southern part of the Sdera al-Sufla village; it is at 8 m from the reservoir and 3.5 m from the adjoining land.
Surface Findings	ASSYRIAN POTTERY

- **Table # 33**

Site # 33	**TELL UMM al-ARABID**
Village	SDERA al-SUFLA
Nahiya	Not provided
Province	al-SHARQAT
District	Not provided
Surface	100 x 70 m.
Site Description	A settlement located to the north west of Tell Qrei'a at a distance of 700 m from on the reservoir's edge south of Sdera al-Sufla village. It is 5 m high. Large quantities of earth have been removed from the reservoir's side and several houses have been built over it.
Surface Findings	ASSYRIAN POTTERY

- **Table # 34**

Site # 34	**TELL DARWISH**
Village	SDERA al-WOUSTA
Nahiya	Not provided
Province	al-SHARQAT
District	71 SDERA al-WOUSTA
Surface	100 x 75 m.
Site Description	It is oval in shape and is 3.5 m. higher than the adjoining land. A large number of houses have been built over it and a great part of its edges have been cut-off.
Surface Findings	ASSYRIAN AND PARTHIAN POTTERY

- **Table # 35**

Site # 35	**TELL MAQBARAT al-FAYADH**
Village	SDERA al-WOUSTA
Nahiya	Not provided
Province	al-SHARQAT
District	71 SDERA al-WOUSTA
Surface	5 dunums (1 dunum = 2,500 m^2.)
Site Description	It is irregular in shape. A large amount of earth has been removed. It contains houses and graves currently used. To its west is another Tell that is damaged called Khirbet Azawi on the northern and western edges of which are residential houses.
Surface Findings	ASSYRIAN POTTERY SHERDS

- **Table # 36**

Site # 36	**TELL al-KARDOUSHIA**
Village	SDERA al-WOUSTA
Nahiya	Not provided
Province	al-SHARQAT
District	71 SDERA al-WOUSTA
Surface	200 x 150 m.
Site Description	An almost oval shaped settlement. 4 m high and contains children's graves. Different infringements have led to the disappearance of finds and the removal of earth.
Surface Findings	ASSYRIAN, PARTHIAN AND SASSANIAN PERIODS

- **Table # 37**

Site # 37	**TELL al-MSAQRA**
Village	SDERA al-WOUSTA
Nahiya	Not provided
Province	aL-SHARQAT
District	Not provided
Surface	Diameter: 70 m.
Site Description	It is located at 500 m. to the right side of the road leading to Qayyara, north-east Sdera al-Wousta. It is circular in shape and is 4 m higher than the adjoining land. Adjacent to it is a modern house and a well. There are minor infringements.
Surface Findings	ASSYRIAN AND ISLAMIC POTTERY

- **Table # 38**

Site # 38	**TELL without name**
Village	SHAJARA
Nahiya	al-ABASSI
Province	al-HAWIJA
District	17A SHAJARA
Surface	Less than 1 dunum
Site Description	It is irregular in shape and is 3.5 m higher than the adjoining land. No infringements exist.
Surface Findings	ISLAMIC POTTERY SHERDS

- **Table # 39**

Site # 39	**TELL KHIRBAT al-SAWWAN**
Village	SDERA al-WOUSTA
Nahiya	Not provided
Province	al-SHARQAT
District	72B SDERA al-OULIA (UPPER SDERA)
Surface	Approx. 3 dunums (1 dunum = 2,500 m^2.)
Site Description	Irregular in shape settlement, its height does not exceed 75-100 cm and is a cultivated land. affected by agricultural infringements causing damage of the upper inhabited surfaces.
Surface Findings	COLOURED AND PLAIN POTTERY SHERDS FROM THE SAMARRA AND HALAF PERIODS

- **Table # 40**

Site # 40	**KHIRBET TANNUR**
Village	SDERA al-OULYA
Nahiya	Not provided
Province	al-SHARQAT
District	Not provided
Surface	Not provided
Site Description	It is located at approx. 1 km north Sdera al-Oulya village, opposite Ashur's ziggurat. It consists of four small Tells adjacent to each other. There are agricultural infringements.
Surface Findings	ASSYRIAN, PARTHIAN AND ISLAMIC POTTERY SHERDS

- **Table # 41**

Site # 41	**KHIRBET HASWA**
Village	SDERA al-OULYA
Nahiya	Not provided
Province	al-SHARQAT
District	Not provided
Surface	Diameter: 100 m.
Site Description	It is located on the right side of the road leading to villages of Sderat and Qayyara at 1 km north of Sdera al-Oulya village, opposite Ashur's ziggurat. It is circular in shape; 5 m high, and to its west is another small Tell at 400 m. There is irregular excavation; the land has been ploughed and caused damage to its contents.
Surface Findings	ASSYRIAN AND PARTHIAN POTTERY

- **Table # 42**

Site # 42	**KHIRBET HANAS WA HAYISS**
Village	SDERA al-WOUSTA
Nahiya	Not provided
Province	al-SHARQAT
District	71 SDERA al-WOUSTA
Surface	100x70 m.
Site Description	The Tell of Khirbet Hanas is rectangular and 4 m high. a water well has been dug as well as ditches; it is affected by agricultural infringements. Tell Hayess is south of Tell Hanas at 500 m and has been damaged due to the recent construction of houses .
Surface Findings	TELL HANAS: MIDDLE ASSYRIAN AND PARTHIAN PERIODS

- **Table # 43**

Site # 43	**KHIRBET DALLI**
Village	SDERA al-WOUSTA
Nahiya	Not provided
Province	al-SHARQAT
District	71 SDERA al-WOUSTA
Surface	Diameter: 100 m.
Site Description	It is circular in shape and is located within the village houses and there are houses on the site; it is 4.5 m high. large quantities of its earth and construction blocks have been removed for construction purposes.
Surface Findings	ASSYRIAN PERIOD

- **Table # 44**

Site # 44	**KHIRBET JALMOUD**
Village	SDERA al-WOUSTA
Nahiya	Not provided
Province	al-SHARQAT
District	71 SDERA al-WOUSTA
Surface	50 x 200 m.
Site Description	A large settlement, approx. 6-7 m. higher above the adjoining plot. On one of its edges is a well. The area has been affected by agricultural infringements.
Surface Findings	ASSYSRIAN, PARTHIAN AND ISLAMIC PERIODS

- **Table # 45**

Site # 45	**TULUL al-AQR (KAR-TUKULTI NINURTA)**
Village	Not provided
Nahiya	Not provided
Province	al-SHARQAT
District	Not provided
Surface	Not provided
Site Description	It is located at approx. 3-4 kms to the north of the city of Ashur. The site extends to the main road on the side of the Tigris river on its eastern edge at an approximate distance of 1km. It is amongst the walled Assyrian cities dated to the Middle Assyrian period. Outside the walls to the north and the west are some small Tells that could be the villages that normally surround main cities. There are agricultural infringements.
Surface Findings	There are no surface findings.

- **Table # 46**

Site # 46	**TELL SDERA**
Village	Not provided
Nahiya	Not provided
Province	Not provided
District	Not provided
Surface	Not specified
Site Description	A small settlement on the right side of the road leading to Nahiyat al Qayyara. It was excavated in the year 2000 and it dates back to the Samarra and Halaf periods.
Surface Findings	No surface findings

- **Table # 47**

Site # 47	**TELL ISBEH**
Village	ISBEH al-SUFLI
Nahiya	Not provided
Province	al-HAWIJA
District	63 KARIAT ISBEH
Surface	4 dunums (1 dunums = 2,500 m^2.)
Site Description	A large settlement, 3-4 m above the adjacent land; irregular in shape due to land infringements, construction of houses and removal of earth.
Surface Findings	No surface findings

- **Table # 48**

Site # 48	**RASSM HUSSEIN AL-ABBAS**
Village	ISBEH al-SUFLI
Nahiya	AL-ZAB
Province	al-HAWIJA
District	Not provided
Surface	160 x 140 m.
Site Description	Large oval shaped Tell; 5 m high. Some of its contents on the edges disappeared with agricultural infringements. There are also graves on the eastern side.
Surface Findings	ASSYRIAN POTTERY SHERDS

- **Table # 49**

Site # 49	**TELL SALEH al-DAKHIL**
Village	SDERA al-OULYA
Nahiya	Not provided
Province	al-SHARQAT
District	Not provided
Surface	100 x 60 m.
Site Description	It is located on the western side of Sdera al-Oulya village and is 3 m. high. A large amount of earth has been removed due to the concentrated construction activity dwellings
Surface Findings	ASSYRIAN POTTERY

- **Table # 50**

Site # 50	**TELL I'ITTAN**
Village	al-SAFINA (close by al-JAFAIFA village)
Nahiya	Not provided
Province	Not provided
District	Not provided
Surface	Diameter: 50 m.
Site Description	A group of four Tells, one of which is small and is 3.5 m. higher than the adjoining land. the other three Tells are smaller. All the land is cultivated
Surface Findings	No surface findings

- **Table # 51**

Site # 51	**KHIRBET HAZZA'**
Village	al-TALAA
Nahiya	Not provided
Province	al-SHARQAT
District	73 al-TALAA
Surface	30 m.
Site Description	A small settlement, located at the southern end of a Tell of gravel, 2.5 m. higher than the adjoining land.
Surface Findings	No surface findings

- **Table # 52**

Site # 52	**KHIRBET al-HAMIDIYA**
Village	HAIJAL al-KABIR
Nahiya	Not provided
Province	al-SHARQAT
District	83 HAIJAL al-KABEER
Surface	Not provided
Site Description	The Tell's sides are totally damaged. 4 m. above the adjacent land. Residential houses have been constructed on top of the Tell and large quantities of earth were removed.
Surface Findings	ASSYRIAN PERIOD

- **Table # 53**

Site # 53	**KHIRBET HAIJAL al-KABIR**
Village	HAIJAL al-KABIR
Nahiya	Not provided
Province	al-SHARQAT
District	83 HAIJAL al-KABEER
Surface	100 x 65 m.
Site Description	A large settlement, higher than the reservoir by 4-5 m. affected by a large number of recently constructed residential houses and mud huts. Large quantities of earth were removed.
Surface Findings	ASSYRIAN PERIOD

- **Table # 54**

Site # 54	**TELL HAIJAL SAGHIR "SHAHAD"**
Village	HAIJAL SAGHIR
Nahiya	Not provided
Province	al-SHARQAT
District	76 HAIJAL SAGHIR
Surface	40 dunums (1 dunum = 2,500 m^2.)
Site Description	A very large settlement. 8-10 m. high. It contains a large concentration of graves.
Surface Findings	ASSYRIAN PERIOD

- **Table # 55**

Site # 55	**KHIRBET al-MASHAK**
Village	AL-MASHAK
Nahiya	Not provided
Province	al-SHARQAT
District	Not provided
Surface	Not provided
Site Description	The Tell is located opposite Tell al-Faras. Some sources claim that the khirba disappeared with the floods, most likely; however, the inhabitants of the village eradicated it to exploit for construction and agriculture.
Surface Findings	ASSYRIAN PERIOD

- **Table # 56**

Site # 56	**KHIRBET NIJMA**
Village	al-ZAWIYA
Nahiya	Not provided.
Province	al-SHARQAT
District	Not provided
Surface	50 x 50 X 4 m.
Site Description	The settlement is almost square in shape and is 4 m. high. It is totally damaged and has been used as a quarry for gravel.
Surface Findings	Not provided

- **Table # 57**

Site # 57	**TELL al-ZAWIYA**
Village	al-ZAWIYA
Nahiya	Not provided
Province	al-SHARQAT
District	Not provided
Surface	200x120 m
Site Description	It is known to the inhabitants of the area ”alwat hamad” and is some 4 m. above the adjoining plain. The settlement was originally built on a rocky and gravel edge of the site. The site is totally damaged and has been levelled for use as agricultural land.
Surface Findings	ASSYRIAN AND SUMERIAN EARLY DYNASTIC PERIODS

- **Table # 58**

Site # 58	**QASR al-BINT**
Village	Not provided
Nahiya	Not provided
Province	al-SHARQAT
District	Not provided
Surface	Not provided
Site Description	The fort (tower) is located directly on the river bank, oppositeWadi al-Karawiya , over a 50 m high mount. It appears to be an observation tower because of its height and position. It dates back to the pre-Islamic period, i.e. Parthian and Sassanian; although no pottery sherds were found on site. It was dated erroneously in the historical directories as being Sumerian, Akkadian and Babylonian.
Surface Findings	ASSYRIAN PERIOD

- **Table # 59**

Site # 59	**TELL al-NAML**
Village	SDERA al-WOUSTA
Nahiya	Not provided
Province	al-SHARQAT
District	Not provided
Surface	125 x 75 x 6 m.
Site Description	Also known as ”tolayl” a diminutive of Tell. It was excavated by an Iraqi expedition. It includes a circular building in addition to other units. It dates to the Sumerian Early Dynastic and Akkadian periods.
Surface Findings	Not provided

- **Table # 60**

Site # 60	**KHAN al-NAML**
Village	SDERA al-WOUSTA
Nahiya	Not provided
Province	al-SHARQAT
District	Not provided
Surface	125 x 75 x 6 m.
Site Description	Located in the Shubh al-Jazirat in the area of Naml and is at 3.5 km from Tell al-Naml. The settlement includes uncut limestone and gypsum construction very likely square in shape of which only one triangle remains. Connected to it are three small Tells from the south and south-east.
Surface Findings	ALL THE SURFACE FINDINGS DATE TO THE HATRA, PARTHIAN AND SASSANIAN PERIODS

- **Table # 61**

Site # 61	**ASHUR**
Village	Not provided
Nahiya	Not provided
Province	al-SHARQAT
District	Not provided
Surface	N.A.
Site Description	The ancient city of Ashur is a historical site of great importance, and the site needs to be protected by a dam barrier to protect it from flooding.
Surface Findings	Not provided

MISSION TO IRAQ (November 2002)
Annex 3

Visit to the World Heritage site of Hatra and to sites on the World Heritage Tentative List: Nimrud, Nineveh, Samarra and al-Ukhaider

On the occasion of the UNESCO assessment mission to Iraq in November 2002, the sites of Hatra, Nimrud, Nineveh, Samarra and al-Ukhaider were visited. Whereas Hatra is a World Heritage site since 1984, the other sites are on the Tentative List of Iraq as submitted to the World Heritage Committee in July 2000. The remaining two Iraqi sites on this list, Ur and Wasit, were not visited. The visits to the five sites helped to gain an overall impression about the layout and the state of preservation of the sites and their monuments. However, they did not include a systematic recording of single items or monuments.

1. Nimrud

During the visit to the site of Nimrud, the members of the mission were guided by Mr Muzahim Hussein, field director of excavations at the site. His explanations concentrated on the North-West Palace and its royal tombs and the remains of the temple of Ishtar.

The settlement of Nimrud, ancient Kalhu, has been shaped by the Assyrian king Assurnasirpal II who decided to transfer the Assyrian capital to this site during the Neo-Assyrian period in the early 9th century BC. There is evidence for preceding occupation at least from the Middle Assyrian period (14th-11th centuries BC) onwards and for post-Assyrian and Hellenistic settlement remains. Nimrud is one of the key sites for the archaeology in Assyria since the systematic exploration of the Assyrian culture started at this place. In 1845, it was Austen Henry Layard who excavated major parts of the North-West Palace. The walls of it were adorned with impressive limestone reliefs showing ritual scenes and military campaigns of the king. Many of these reliefs were brought to museums all over the world. A second period of exploration started in the late 40s of the 20th century when the British Expedition launched an excavation programme. It ran until the early 60s and was directed by M.E.L. Mallowan and later by David Oates. On the main mound ("citadel"), many substantial Assyrian public buildings were uncovered and, at the periphery of the site, the huge Fort Shalmaneser complex was excavated, the armatory of Nimrud. Activities in the lower town (ca. 360 ha) focused only on some spots. Further work was carried out by a Polish team in the 70s, the Italians in the late 80s, and the British in 1989, in parallel to Iraqi excavations. The most spectacular was the discovery of four royal tombs in the southern wing of the NW-Palace which belonged to Assyrian queens and royal women.

In the year 2000 excavations started at the area of the temple of Ishtar, east of the ziqqurrat. The entrance to the temple was adorned with protective figures made of limestone, known as "lamassu", which are known from other Assyrian palaces and temples. The State Board of Antiquities launched a reconstruction programme for this part of the temple of Ishtar. The central entrance was rebuilt with mudbricks, and a vault made of concrete and bricks was placed on top of this entrance.

This reconstruction programme continues previous reconstructions and protective installations for the mudbrick architecture and the remaining limestone reliefs. Larger parts of the NW-Palace and the temple of Nabû have been reconstructed with roofings and mudbrick walls. Parts of the palace are roofed with traditional techniques, such as wooden beams and mats, others bear a glass and metal construction. The protective construction of the entrances to the throne-hall makes partly use of concrete. Recently, tin roofs have been placed above most of the limestone reliefs in order to protect them against erosion. Although many of the reliefs are not exposed to sun-light, rain and wind, it was noted that some of the protective roofs of the NW-Palace are in extremely bad shape and some of the rooms are used as shelter by birds. The protection of the reliefs is not always guaranteed - in spite of a severe guarding regime which has been established since the discovery of the graves in 1989.

Three publications on Nimrud have been issued recently, concerning the excavations of the British and the Iraqi archaeologists up to nowdays (Oates and Oates 2001) as well as the royal tombs (Damerji 1999; Hussein and Suleiman 1999/2000).

2. Nineveh

The city of Mosul, today the biggest town of northern Iraq, lying on both sides of the Tigris River, covers partially the ancient city of Nineveh, once the last Assyrian capital east of the Tigris River. Only some parts of this extremely large 650 ha site were visited by the mission. Mr Manhal Jaber, director of the excavations at Nineveh explained the archaeological exploration of the recent years.

As a site of eminent importance for the prehistory of Northern Mesopotamia, Nineveh obtained its fame by the Assyrian discoveries during the mid-19th century. Again, it was Layard who excavated Neo-Assyrian palaces both of Sennacherib and of Ashurbanipal of the 7th century BC. Whereas Sennacheribs SW-palace, the “palace without rival”, was adorned with limestone reliefs, the N-Palace of Ashurbanipal contained not only reliefs but also the famous library of the Assyrian king. Already in the Middle Assyrian period, was the city famous for its rich gardens. The exploration of Nineveh during the 20th century was less systematic than at Nimrud, with a British expedition around M.E.L. Mallowan and R. Campbell Thompson in the 30s. Since the 60s, Iraqi archaeologists launched an immense reconstruction and restauration programme, mainly focussing on the city’s fortification and its gates. Large parts of the city wall have been reconstructed with dressed limestone and some of the city gates were reconstructed with vaults. The Nergal gate shows the protective figures (“lamassu”). The reliefs which remained in place in the SW-Palace on Kuyunjik (the main mound) have been protected by the State Organisation of Antiquities and Heritage with a steel and tin construction, while the walls were reconstructed with mudbricks, and fragments of some of the sculptures were joined with steel elements. Intense research was devoted to the SW-Palace during recent years (Russell 1991; 1998), drawing attention to the slow destruction of the remaining reliefs and the looting activities at this site. At the time of the mission, an Italian-Iraqi joint project had started aiming at recording the

reliefs and their state of decay with modern techniques and at the smooth reconstruction of these parts of the SW-Palace.
The ekal masharti of Nineveh (the armatory) was excavated in the late 80s, south of Kujunjik, in a location called Nebi Yunis where an impressive mosque covers the western part of the mound. What has been excavated so far, in the late 80s, is the entrance of the ekal masharti which was, again, adorned by protective figures of limestone, not made of one block, but of several small stones. The inscriptions of these “lamassu” indicate that the building was erected during the time of Sennacherib. Large parts of the building lie under the present mosque, and it is therefore impossible to carry out further excavations. Moreover, the entire western slope of Nebi Yunis has been recently covered with a stepped stair construction and a street leading to the sanctuary. The entrance to the ekal masharti is exposed to weathering and damage, as the former roof does not exist any more and the fence has been removed.

Since a few years, the Iraqi government has launched a revival programme for the site of Nineveh and the library of Ashurbanipal. Its main goal is the creation of a centre for cuneiform studies on the area at the university of Mosul, as well as the production of copies of all the existing texts from the former library of Ashurbanipal located in museums all over the world.

3. Samarra

The site of Samarra is one of the most extended archaeological sites in Iraq. In Near Eastern studies, Samarra stands on the one hand for a Chalcolithic civilisation (Samarra complex), mainly known for its high quality pottery production, and on the other hand as a large Abbasid city and its extended palaces and mosques which flourished after the calpih al-Mu’tassim decided to move his capital from Baghdad to Samarra in 836 AD (cf. Northedge 2001a; cf. Al-Janabi 1983). At that time, the occupied area was 57 km^2. After two generations, Samarra ceased to be capital in 892 AD.

At Samarra, the mission visited the great mosque of al-Mutawakkil with its famous spiral minaret (Malwiyya), as well as the palace of al-Ashiq on the western bank of the Tigris River. The minaret and the external walls of the mosque’s courtyard have been restored by the State Organisation of Antiquities by using the same building materials as for the original structures, i.e. baked bricks. During the 90s, a project was initiated aiming at reconstructing the courtyard of the mosque as to its original plan. This included the construction of hundreds of columns and pillars which, at a later stage, should have been covered with a roof. At present, work seems to have been interrupted and what is visible are the foundations and the bases of these columns (UNESCO 2003). Contrary to their predecessors of marble, they are made of baked bricks and a steel-concrete construction. The problematic nature of these reconstruction techniques was discussed with Dr George from the SBAH who took part in the visit.

The al-Ashiq palace on the western bank of the Tigris was rapidly visited. During the 70s, this impressive building was reconstructed by the State Organisation of Antiquities and Heritage, reportedly according to the only remaining corner of original height which is preserved in the NE. In the upper storey the walls have been partly reconstructed and plastered.

4. The fortress of al-Ukhaider

The location of al-Ukhaider is ca. 50 km southwest of the city of Kerbela. This palatial building complex was possibly constructed in the late 8th century BC even though its exact date is discussed. Whether there even exist pre-Islamic origins is not yet clear (cf. Northedge 2001). The entire complex of al-Ukhaider measures 175 by 163 metres, surrounded by a pisé enclosure. The building complex itself is constructed of rough stone and gypsum mortar and the inner castle has an extension of 80 x 112 m.

After its rediscovery almost 100 years ago and some general surveying work, excavations were carried out by the Iraqi State Organisation of Antiquities and Heritage in the 60s. Extensive reconstruction work during the 70s and 80s resulted in an almost completed building where it appears difficult to identify original structures and reconstructed ones. However, before the reconstruction started, the building's original height was still preserved (Northedge 2001b).

Air strikes to an ammunition deposit close to the building in 1991 do not seem to have damaged the building (cf. UNESCO 2003).

5. Hatra

During the stay at the World Heritage site of Hatra, the inner part of the city was visited. The latest reconstruction work being carried out at the Ala'a temple was observed. Stone sculptures and frieses are reconstituted by the application of traditional craftsmanship and stonework. However, some concern can be expressed as regards the reconstruction methodology in light of internationally agreed upon conservation/restoration standards.

Concluding remarks

Due to short duration and character of the visits to the sites of the World Heritage Tentative List, it is only possible to draw some preliminary conclusions:

- As to the impressive Assyrian sites of Nimrud and Nineveh, it was discussed whether these sites should be nominated as single sites for the World Heritage List or whether they should be part – altogether with Ashur - of an ensemble of World Heritage sites assembled under the rubrique "Assyrian royal cities". However, before considering such an option, a thorough analysis of all those elements pertaining to the criteria relevant for a nomination is necessary.

- Both the Islamic sites of Samarra and al-Ukhaidar are unique monuments of this civilisation. Similar to the sites in Assyria, an evaluation will have to be carried out before further recommendations and decisions. Special attention is to be paid to any further developments of the reconstruction measures in the courtyard of the great Mosque at Samarra.

- Overall, the restoration methods and, most frequently, the reconstruction of the monuments implemented need to be further assessed, in view of their impact on the integrity and authenticity of the sites.

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Arnulf Hausleiter/Veronique Dauge, February 2003

Annex 4

Mission to Iraq (18-28 November 2002)
Programme of the mission

16 November	● Arrival of Dr Arnulf Hausleiter in Amman
17 November	● Arrival of Eng. Lucio Cavazza in Amman ● Preparatory meeting for the mission
18 November	●Departure from Amman and travel by car to Baghdad
19 November	● Meeting with the Minister of Education, H.E. Dr Fahad Salim Al-Shaqra, and members of the Iraqi National Commission ● Meeting with Dr Donny George, Director-General of Research and Studies at the State Board of Antiquities and Heritage ● Meeting with Dr Jaber Khalil Ibrahim, Chairman of the State Board of Antiquities and Heritage ● Courtesy visit to UNDP
20 November	● Meeting with Dr Donny George, Director-General of Research and Studies at the State Board of Antiquities and Heritage ● Visit of the National Museum ● Visit of the site of Tell Harmal
21 November	● Departure for the Makhoul Dam area, accompanied by Ms Khamael Hussein and Mr Loai Al-Omari from the National Commission, and Dr Donny George from the State Board of Antiquities and Heritage ● Visit of the dam's site supervision office and meeting with Mr Khaled Zeidan, site engineer responsible for the project ● Visit of six archaeological sites in the reservoir area, guided by Mr Burhan Shaker, director of the excavation project ● Night in Mosul
22 November	● Thorough visit of the site of Ashur, in the company of Dr Jaber Khalil Ibrahim ● Night in Mosul
23 November	● Visit of the sites of Nineveh and Nimrud ● Visit of the Mosul museum and other areas of the city ● Night in Mosul
24 November	● Visit of the site of Hatra, inscribed on the World Heritage List ● Visit of the mosque of Samarra ● Return to Baghdad

25 November	● Visit of Babylon ● Visit of the fortress of Al-Ukhaider
26 November	● Working session at the State Board of Antiquities and Heritage ● Meeting with Mr Mazen Al Hassan and Mr Salah Bezirgan from the Ministry of Irrigation and the Al-Furat Company ● Meeting with Dr Jaber Khalil Ibrahim
27 November	● Meeting with H.E. Mr Hamed Yussuf Hammadi, Minister of Culture ● Final working session at the State Board of Antiquities and Heritage ● Meeting with Mr Paolo Battino and Dr Carlo Lippolis from the Iraqi-Italian Institute of Archaeology
28 November	● Departure from Baghdad and return to Amman by car
29 November	● Departure of Eng. Cavazza and Dr Hausleiter

Annex 5

Mission to Iraq (18-28 November 2002)
List of persons met

H.E. Dr Fahad Salim Al-Shagra
Minister of Education

H.E. Mr Hamed Yussuf Hammadi
Minister of Culture

Dr Muayed Damerji
Advisor to the Minister of Culture

National Commission for UNESCO
Mr Mohammed Rija Shlah, secretary general
Mr Loai Al-Omari
Ms Khamael Hussein

State Board of Antiquities and Heritage
Dr Jaber Khalil Ibrahim, Chairman of the Board
Dr Donny George, Director-General of Research and Studies
Dr Rabi'a Al-Qaisi, Director-General of Restoration
Dr Burhan Shaker, Director, Makhool excavation project
Mr Ferhan az-Azawi, Assistant field director in Ashur
Dr Manhal Jaber, Inspector of Antiquities for the Mosul province
Mr Abed Jero, Field director at Kartukulti Ninorta
Mr Muzahim Mahmoud Hussein, Field director of Nimrud
Mr Hazem Al-Najafi, supervisor of the restoration work of the Al-Lat temple in Hatra
Mrs Ilham Hashem, Field director of Babylon
Mr Abdel Hadi Mounem, archaeologist in charge of the northern palace in Babylon

Mr Khaled Zeidan
Site engineer responsible for the Makhool Dam

Mr Mazen Al-Hassan
Director General for Dams
Ministry of Irrigation

Mr Salah Bezirgan
Al-Furat Company
Ministry of Irrigation

Mr Francis Dubois
UNDP Resident Representative

Mr Paolo Battino
Dr Carlo Lippolis
Iraqi-Italian Institute of Archaeology

1. Executive Summary

Introduction

Within the context of the construction of a dam on the Tigris River, some 230 km north of Baghdad, endangering cultural heritage, this assessment mission to Iraq was organized by the World Heritage Centre, the Division of Cultural Heritage and the UNESCO Amman Office. It consisted of two experts, one Italian hydraulics engineer (Eng. Lucio Cavazza) and one German archaeologist (Dr Arnulf Hausleiter), accompanied by a UNESCO Programme Specialist (Ms Veronique Dauge) as coordinator, and was carried out from 18 to 28 November 2002.

The main objective of the mission was to assess the impact on archaeological sites of the flooding of a large area further to the construction of the Makhool Dam. As stated in the report provided by the Iraqi Ministry of Culture in August 2002 (see annex), UNESCO's assistance was requested in planning a salvage excavation campaign and in providing expertise with regards to the feasibility of building a protective wall for the site of Ashur. It is to be noted that the nomination file for the inscription of Ashur on the World Heritage List was submitted to the World Heritage Centre in September 2002, altogether with a "Request for emergency assistance".

One of the significant points of the mission was the exceptional welcome provided to the team and the quality of the lengthy working sessions held. Full assistance and cooperation was received from the National Commission for UNESCO and from the State Board of Antiquities and Heritage.

The Makhool Dam area

The team visited the supervision office of the Ministry of Irrigation for the construction of the Makhool Dam, where a plan drawing of the structure was exhibited. Heavy excavation works are underway in preparing the dam foundation area, notably the digging of the cut-off wall in the riverbed, presumably also for the hydroelectric power station. Unfortunately, no specific documentation on the effective construction and technical studies was presented, thus not allowing the hydraulics engineer to make any assessment. A further meeting took place in Baghdad with responsible persons at the Ministry of Irrigation, but no additional information on the project was given. Upon questioning, it was asserted that a feasibility study had been carried out prior to the final design of the dam, including an environmental impact assessment.

Sixty-three sites, including Ashur, have been identified so far in the zone of the reservoir, of which 62 will be flooded by the end of 2006. Six of them were visited by the mission. The State Board of Antiquities has started an intensive salvage excavation campaign, devoting a large amount of staff and funds to the project, which, it is hoped, will be supported by UNESCO and international scientific institutions. The information provided by the State Board (see report in annex), allows an evaluation of the priorities with respect to the sites affected by the construction of the dam.

The city of Ashur

A full day visit was devoted to the site of Ashur, where the team was joined by the Chairman of the State Board of Antiquities and Heritage. A general assessment of the site was carried out, in view of the possible inscription of the site on the World Heritage List and, particularly, as regards the risks of flooding.

Since the reservoir is to be used for hydroelectric power generation, it will generally be kept at the maximum possible level, compatible with the available runoff from the catchment and any provision of irrigation water to downstream users. The possibility of water infiltration and seepage to the archaeological excavation areas is a real threat and provisions must be made to deal with the problem. However, due to the non-availability of the technical documentation on the environmental impact of the dam and on the level of water of the future reservoir, as well as of detailed topographic information, the expected damage on the archaeological remains, and the possible measures to avoid it (retaining wall, gabions, etc.), could only be evaluated approximately.

The planning of salvage measures which can be envisaged for the site of Ashur is to bear two components: the feasibility of building a retaining wall, for which detailed information is needed (see above); and the development of an integrated research strategy for the site including archaeological exploration and excavations, conservation and restoration measures as well as the presentation and interpretation of the remains.

In order to coordinate the archaeological fieldwork during the remaining four years (2003-2006), the Iraqi authorities intend to establish in the very near future a well-equipped local research centre for the entire project, for which UNESCO's assistance is requested.

The team worked extensively during, and after, the mission in assisting the State Board of Antiquities and Heritage in revising the nomination file for the inscription of Ashur on the World Heritage List as well as the Emergency assistance request form. The activities mentioned above were included and described within this request which has been submitted by the Iraqi Authorities to the World Heritage Centre.

Other sites

The team also visited other important Iraqi cultural heritage sites, such as Hatra, inscribed on the World Heritage List, where important restoration work is being carried out, Nineveh and Nimrud, Samarra and the fortress of Al-Ukhaider, which have been identified on the Iraqi World Heritage Indicative List, as well as the partly reconstructed city of Babylon.

Meetings

Upon arrival of the team, a meeting took place at the Ministry of Education, with the Minister, H.E. Dr Fahad Salim Al-Shaqra, members of the UNESCO National Commission and of the State Board of Antiquities. The Minister presented the expectations of the Iraqi authorities in regard to this mission and stressed the concern and full commitment of the Government to safeguard the antique capital city of Ashur and record all evidence related to the sites in the Makhool Dam reservoir area.

Several meetings were also held at the State Board of Antiquities and Heritage, notably with Dr Jaber Khalil Ibrahim, Chairman of the Board, and his staff. Dr Donny George, Director-General of Research and Studies, accompanied the mission during the whole visit, as well as Ms Khamael Hussein and Mr Loai Al-Umari from the Iraqi National Commission for UNESCO.

At the end of the mission, a meeting took place with H.E. Mr Hamed Yussuf Hammadi, Minister of Culture, during which the whole mission was discussed at length, as well as the possibilities for UNESCO to support an international salvage project for the Makhool Dam area and Ashur. Besides an invitation letter which will be addressed by the Iraqi authorities to all scientific institutions having worked in Iraq, it is hoped that UNESCO would agree to launch an appeal to the international community to support the project. The possibility of organizing a congress on the Makhool Dam area was also mentioned by the Minister.

Main recommendations

- **In view of the remaining four years for the completion of the rescue operations in the area (2003-2006), and taking into account the considerable amount of archaeological work and research required, the mission recommends that the Iraqi Authorities launch an invitation to archaeological expeditions on an international level for carrying out salvage excavations and studies of the Makhool Dam reservoir area's sites and landscape, and that UNESCO supports such an appeal and salvage project.**

- As envisaged by the State Board of Antiquities and Heritage, the mission recommends the establishment of a Coordination centre for the archaeological research in Ashur and the whole area, which would be supported by UNESCO and the World Heritage Fund through the Emergency Assistance Request submitted by the Iraqi Authorities.

- The archaeological sites of Ashur, the other sites in the future reservoir area and the archaeological landscape are equally important for the research of the cultures and civilisations of this part of

Assyria. Therefore, an integrated approach is recommended, combining on-site and off-site research in the area, based on archaeological survey strategies, archaeological excavations and scientific methods of analysis.

- The implementation of salvage measures for the site of Ashur depends mainly on the decision on which retaining system will be erected. Only based on this, a research strategy for the site covering archaeological exploration, restoration and conservation measures as well as the presentation of the remains can be applied.

- **As regards the protective measures to be implemented around the city of Ashur, no information was made available on the future operation and management of the reservoir, so it is not known what the excursions of the water levels at the site would amount to. Such information is essential for the study of adequate protections from both the reservoir waters and the eventual infiltrations and leakages to the existing and future excavation sites of Ashur. However, essentially two types of solutions are proposed for maintaining the site and archaeological excavations free of seepage and infiltration waters:**

(a) the construction of an earth embankment with impermeable core and cutoff wall into the foundations, a solution much similar to the main dam at Makhool. As indicated in the Engineering Report, such an embankment could be a completely separate structure, if and where necessary, at some distance from the Ashur site thus providing a buffer zone for future developments and archaeological excavations; alternatively in some other areas it could simply act as a protection for the existing slopes and escarpments of the Ashur promontory. Such a solution would be obviously quite cost-effective as all equipment, materials, etc. are the same as for the construction of the main dam.

(b) The construction of a "Terramesh" wall with impermeable membrane lining (of the type CLAYMAX LINER for example) as a solution for the soil reinforcement of the escarpments at the Ashur site down to the Tigris River.
Such a solution makes use of eco-compatible materials and bio-engineering techniques combining suitable soils and plants with the natural fill materials.
This offers immediate stabilisation of the slopes and re-naturalisation over time by promoting a positive evolution of the new ecosystem created by the reservoir and the training works around the Ashur site.
In the Engineering Report further details are given on the proposed solution with an indication also of the approximate necessary costs.

Conclusion

Although some technical issues were not solved, the mission was extremely positive and encouraging for future cooperation, notably in light of the confidence in UNESCO shown by all our counterparts. It is strongly hoped that the information requested be made available as soon as possible by the relevant authorities so that technically sound recommendations can be made regarding the protective measures for Ashur. As regards the World Heritage, the updated nomination file for Ashur and the revised emergency assistance request have been officially submitted to the World Heritage Centre in January 2003.

UNITED NATIONS

EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION

UNESCO MISSION TO IRAQ FOR AN EVALUATION OF THE IMPACT OF THE MAKHOOL DAM PROJECT ON THE ARCHAEOLOGICAL SITES OF THE AREA AND THE PROTECTION OF THE SITE OF ASHUR FROM THE WATERS OF THE FUTURE DAM RESERVOIR AREA (18 TO 28 NOVEMBER 2002)

FINAL REPORT* – *CIVIL ENGINEERING COMPONENT

UNESCO MISSION TO IRAQ FOR AN EVALUATION OF THE IMPACT OF THE MAKHOOL DAM PROJECT ON THE ARCHAEOLOGICAL SITES OF THE AREA AND THE PROTECTION OF THE SITE OF ASHUR FROM THE WATERS OF THE FUTURE DAM RESERVOIR AREA

(18 TO 28 NOVEMBER 2002)

FINAL REPORT* – *CIVIL ENGINEERING COMPONENT

1. GENERAL

. site 70 ha + buffer zone 100 ha
. archaeological excavations
. dam & reservoir
. necessary protections
. other archaeological sites
. etc.

2. MAKHOOL DAM & RESERVOIR

. general – feasibility study
EIA
design & construction
etc.
. dam – irrigation
hydropower station
cutoff
free overflow spillway
etc.
. reservoir – operation / management study
excursions of levels & their timing
etc.

3. ASHUR PROTECTION MEASURES

. from waters of the reservoir to the north, east and south of the site
. infiltration / seepage into foundations of archaeological excavations
. sand drains
. sump pits & pumping stations
. etc.

ANNEXES: Figures : Ashur site at 1:4000 scale
Reservoir area
North escarpment from Walter ANDRAE (1909)
Soil Map
Photographs
AUTOCAD drawing of proposed protection measures
Meetings attended and list of persons met
Sites visited

RESUME: ASHUR, the religious capital of the ancient Assyrian empire is under threat of inundation from the rising waters of an artificial lake or reservoir created by the construction of a large dam at Makhool, already underway some 30 to 40 km to the south of the ancient city on the Tigris river. Suitable protections to the north, east and south around the promontory on which rests the remains of the city, as discovered from excavations starting in the early 1900's, are urgently needed in view also of its inscription in the World Heritage List of Monuments, managed by UNESCO.

1. GENERAL

ASHUR (the modern Qalat Sharqat), the earliest and oldest of the four Assyrian capitals (it was first settled in the 3rd millenium BC), lies on the western, right bank of the river Tigris on a bluff or plateau covering an area of about 100 ha, and is situated some 96 km south of Mosul (the ancient Nineveh) almost halfway between the two left-bank tributaries of the Tigris, the Lower and Upper Zab rivers.

The whole area lies some tens of metres above the mean water levels of the Tigris river and in fact there are no records of flooding of the present archaeological sites. The attached map overleaf, FIGURE 1 at a scale of 1:4.000, shows the extent of the area to be protected, some 70 ha for the ancient city and another 100 ha approximately as a buffer zone. The 10 m contour line appearing on the map has been indicated as corresponding approximately to the maximum reservoir level anticipated at 156 m asl.

There is however quite a large dam under construction further to the south, some 30 to 40 km downstream of this site, with a reservoir at its full capacity of some 3 billions m^3 of water, reaching a maximum level of 156 m asl.

Under these conditions parts of the city, especially to the south, would be flooded for certain periods of the year once the reservoir becomes operational by 2006 as anticipated, and in any case the archaeological remains of the ancient structures would suffer from infiltration and seepage of underground waters. In fact the phreatic levels in the foundations of the whole area would rise considerably as the level of the reservoir formed by the dam, rises to its maximum levels.

While the dam and reservoir are purpoted to be principally for irrigation purposes, there is nevertheless incorporated in the dam also a hydropower station exploiting the relatively large flows released from the reservoir and the head available from maximum reservoir level to the turbine elevation, for the generation of some 300 MW of hydroelectric power.

It is therefore necessary to protect the Ashur site with adequate measures especially in view of its inscription in the World Heritage List of Monuments, managed by UNESCO.

There are also in the area of the reservoir some 60 other archaeological sites of lesser importance, for which it is anticipated to launch a world-wide intensive salvage excavation campaign with UNESCO's and other international scientific organizations' assistance and cooperation from the National Commission for UNESCO and from the State Board of Antiquities and Heritage, which is already devoting a large amount of staff and funds towards the project.

These sites however will ultimately be flooded by the Makhool reservoir once it reaches its maximum levels, anticipated for the year 2006.

FIGURE 1 – MAP OF THE ASHUR SITE AT SCALE 1:4.000

(1992 Dr. Ludwig Reichert, Verlag Wiesbaden)

FORMAT A3

2. MAKHOOL DAM & RESERVOIR

General

The project for the dam and reservoir at the Makhool site has been carried out by the Ministry of Irrigation staff with the assistance of the Al Furat Company which is a specialized department of the same Ministry. This same company is also responsible for the studies, investigations and design of the protective measures for the Ashur site.

The dam in now under construction, the main contractor being also a subsidiary of the Irrigation Ministry – presumably some of the works would be carried out by other specialized sub-contractors. The Site Supervision activity is carried out by the Ministry's staff as well.

From the fragmentary information gathered, it would seem that a feasibility study has also been carried out, comprehensive of an EIA (Environmental Impact Assessment). It is not known whether the EIA considered also the 60 odd archaeological sites in the area of the future reservoir, and in particular whether specialized and specific studies were carried out for the Ashur site.

At the time of writing the present report, no factual information has been supplied by the Iraqi authorities to the members of the Mission regarding the eventual feasibility study carried out, the preliminary and final designs documents for the dam and, more importantly, no information was made available on the protective measures being studied for the city of Ashur.

Makhool Dam

The only drawing reviewed by the members of the Mission regarding the dam, consisted in a schematic plan layout of the dam structure and all other appurtenant works, this was actually attached to a wall in the building occupied by the Site Supervision staff. Upon requests for further information, drawings, etc. the Site Engineer replied that all available information could be obtained in Baghdad at the offices of the Ministry.

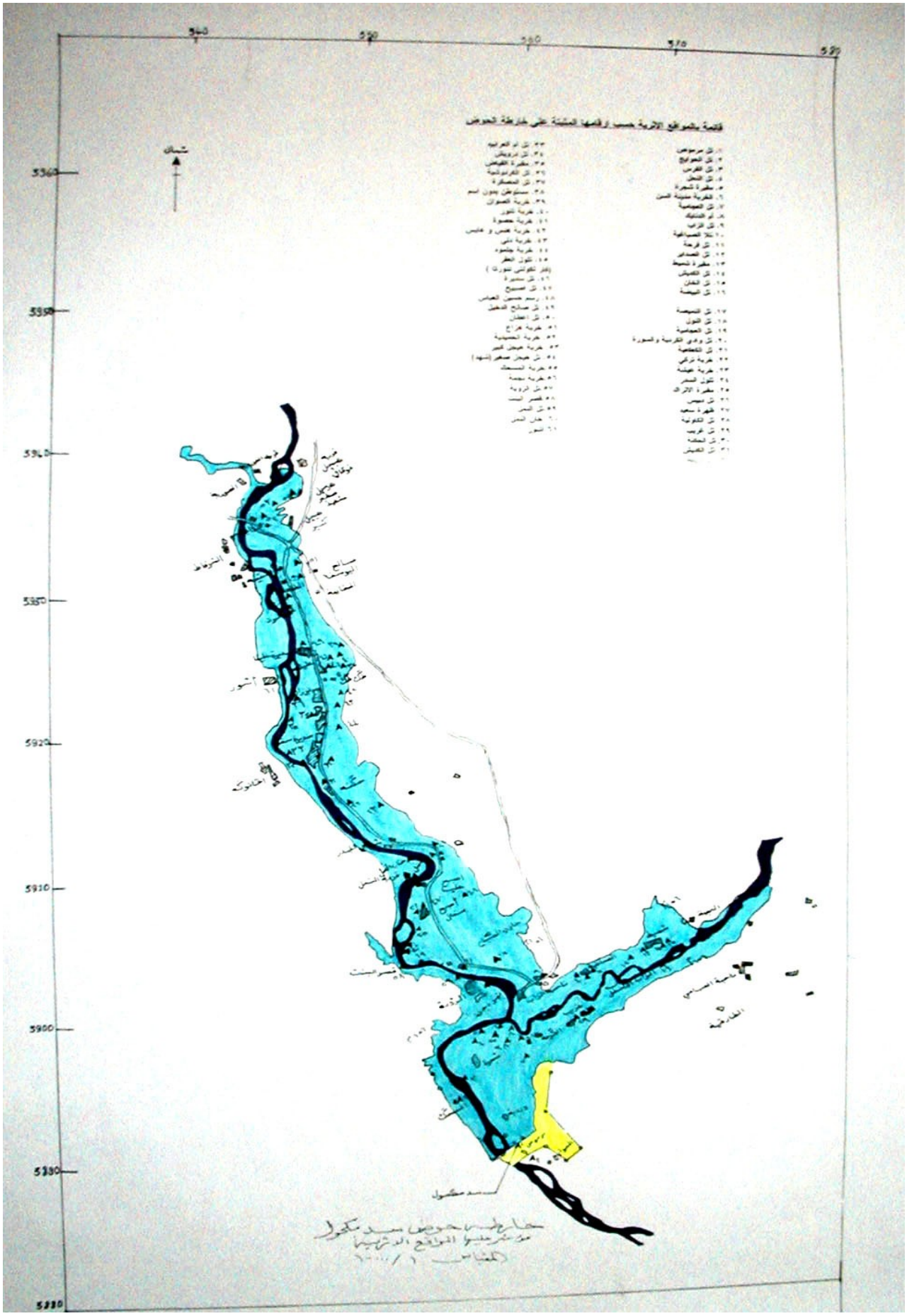
The dam appears to be a zoned earth embankment type of structure with a cutoff wall 1m thick in bentonitic cement slurry to create an impermeable barrier in the sedimentary foundation strata, with a free overflow spillway concrete structure on one of the abutments in which are incorporated the outlets for the irrigation water releases. At the downstream toe of the dam there is also a hydropower station with all appurtenant works. Presumably the releases from the hydroelectric station are also utilized for irrigation purposes.

Reservoir

At full storage level of 156 m asl (as indicated by the competent authorities), the dam would impound some 3 billion cubic metres of water, creating an immense reservoir extending some 30 to 40 kms upstream of the dam along the Tigris river and for some kms also on the two Zab rivers. The maximum width of the reservoir just a few kms upstream of the dam at the confluence of the Lower Zab with the Tigris river is about 10 kms. The attached FIGURE 2 overleaf shows the extent of the proposed reservoir and the location of the Ashur site.

At the site, the eastern edge of the city facing the Tigris river is at an elevation of 155.38 m asl while the highest levels indicated on the knoll or plateau forming the ancient city, with all the extensive excavations carried out since the earky 1900's to date, are over 179.00 m asl.

FIGURE 2



To the south of the site however the topography once again slopes downwards toward the river and the escarpments present severe gully erosion. The width of the reservoir in this area should reach 2 to 3 kms with a depth of over 10 m.

No information whatsoever is available on the future operation and management of the reservoir, so it is not known what the excursions of the water levels at the Ashur site would amount to. Such information is essential for the study of adequate protections from both the reservoir waters and the eventual infiltrations and leakages to the existing and future excavation sites of Ashur.

3. ASHUR PROTECTION MEASURES

General

It is known that the Al Furat Company of the Ministry of Irrigation, specialized in these types of works[1], is carrying out detailed investigations (topographical, geological and geotechnical) and studies for the protection measures to be proposed and built at the Ashur site. However to date no information has been made available on this matter – see list of information requested and further clarifications supplied for the Iraqi Ambassador to UNESCO in Paris, attached to the Report.

From the topographical data available it would seem that some protective measures are necessary especially to the south, but also on the eastern flank and to the north of the Ashur site, where the ancient course of the Tigris still exists and would also be flooded by the reservoir. Such measures would be required to hold back the waters of the impounding lake and prevent flooding of the archaeological sites on the promontory forming the Ashur site. The attached FIGURE 3 overleaf shows the northern face of the bluff forming the Ashur site promontory into the future reservoir and dates back to 1909 – the present situation in not significantly different from what is shown on the sketch.

Further measures would also be necessary to prevent infiltration and seepage into the foundations of the present and future archaeological sites, as the presence of the dam reservoir would cause groundwater levels to rise throughout the area and remain at high levels, with respect to the present situation, for quite long periods, depending on the reservoir operation (as the lake is also to be used for power generation, then generally the water levels would be kept at full reservoir for maximum head on the turbines!). The attached soil map overleaf, FIGURE 4, indicates that the materials in the area are mostly of the sedimentary type, silty gravelly gypsiferous soils with, presumably, high permeability.

Protective Measures Proposed

After the detailed visit to the site – see the attached photographs, included as ANNEX 1, of the relevant areas to be studied and protected– and what little information could be gathered from the concerned authorities, some indications on the types of protective measures that could be adopted for the Ashur site are given in what follows.

Essentially two (2) types of solutions are proposed, with further indications on other provisions which may be useful for maintaining the archaeological excavations free of seepage and infiltration waters – the structures to be protected are made from sun-dried clay bricks for which the presence of humidity is quite deleterious.

The solutions proposed do not in any way exclude the construction of a separate structure where this is necessary, i.e. where it is not possible to simply protect the existing slopes and escarpments but it is necessary, on the other hand, to leave a buffer zone between the protection structure and the existing or future archaeological excavations.

[1] **See "An Engineering Treatment for the Underwater Problem in the Foundations of the Princedom House – Dar Al-Imara in kufa" SUMER Vol. L No.1 & 2 1999-2000**

FIGURE 3 – Walter Andrae ASHUR North Face from the East, 1909

(colored chalk on tinted paper - H 10 in/31cm - Collection of Ernst Andrae)

FORMAT A4

FIGURE 4 – SOIL MAP

(PLATE 4 Scale 1 : 2.500.000 ?)

FORMAT A4

1. Construction of an earth embankment with impermeable core and cutoff wall into the foundations, a solution much similar to the main dam at Makhool. Such a solution would be obviously quite cost-effective as all equipment, materials, etc. are the same as for the construction of the main dam.

   It is not clear at the moment whether a full dam section is necessary (both upstream and downstream slopes, etc.) or if it is feasible to carry out only the upstream part of the protective embankment, with the present slopes of the Ashur promontory (suitably cut back to sound foundation material) forming the remainder of the embankment – see the attached AUTOCAD drawing overleaf, FIGURE 5.

   From a preliminary estimate of the quantities involved, the earthworks could amount to some half a million cubic metres of materials, with the cutoff extending over about 2 kms for a depth of 5 to 10 m, for a thickness of not more than 60 cm. The attached drawing shows a schematic detail of the solution proposed, to be verified and modified according to the actual site conditions, as would be indicated from a detailed topographical survey of the area.

   Rough costs, to be verified with the Iraqi counterparts, could be:

   - earthworks $USA 100 per metre cube
   - cutoff wall $USA 1000 per metre length.

   The total cost could be of the order of some $USA 30 million.

FIGURE 5 – ASHUR SITE PROTECTION MEASURES

SCHEMATIC DETAILS OF POSSIBLE PROTECTION MEASURES WITH EARTH-ZONED EMBANKMENT WITH INCLINED CENTRAL CLAY CORE

FORMAT A3

2. TERRAMESH walls with impermeable membrane lining, MACLINE Geo Clay Liners, by Maccaferri

   A brief note and schematic presentation of a possible solution are given in what follows.

TERRAMESH SYSTEM – A Solution For Soil Reinforcement

The Terramesh System uses a combination of gabions and mechanically reinforced soil to create a structure for the protection and support of slopes. A vertical or sub-vertical skin of gabions is anchored to the backfill by using metal strips or double twist woven steel wire mesh panels as reinforcement along horizontal planes. The use of such a mesh exploits not only the friction on the surface of the wires but, more importantly, the mechanical interlocking properties of the backfill due to the large size of the openings of the mesh in relation to the diameter of the wires, and results in an increase of the total strength of the reinforcement, which would be impossible for materials whose strength is derived solely from surface friction. Further, by using panels of mesh, the reinforcement is continuous along the whole length of the slope being protected.

Structures up to 20 m high have been successfully used throughout the world with the following important advantages:

- permeability of the front face guaranteeing drainage of the backfill;
- flexibility, enabling the structure to take up ground settlement without compromising its structural integrity;
- ease of construction, significant soundproofing characteristics and structural safety in case of fire near the front face;
- reduction of environmental impact through the use of vegetation incorporated into the front face of the structure which, through the versatility of gabions, may be formed with vertical, battered or stepped front face as required, with minimal environmental impact.

To ensure optimum performance from the finished structure while simplifying the installation, have led to the development of a product in PVC-coated and galvanized double-twist woven wire mesh specially produced for these applications. The front face and soil reinforcement tail is made from one continuous mesh panel.

There are two different basic Terramesh structures, depending on the type of front face; one is in stone-filled box gabions (Terramesh unit) and the other is entirely filled with soil (Green Terramesh Reinforced unit of the "Water" type or "Soil" type). The Green Terramesh Reinforced unit, "Soil" type, is used for soil consolidation works and/or for retention of embankments and slopes, while the "Water" type, which differs in the geo-synthetics used (three-dimensional geogrid or other synthetic materials), can be used for bank protection of water courses.

IMPERMEABILIZATION OF TERRAMESH STRUCTURE

While the Terramesh structures described above should solve remarkably well the problem of protecting and supporting the slopes of the Ashur area to be invaded by the waters of the reservoir created by the Mak'Houl Dam, they do not protect the archaeological sites from infiltration and seepage of these waters.

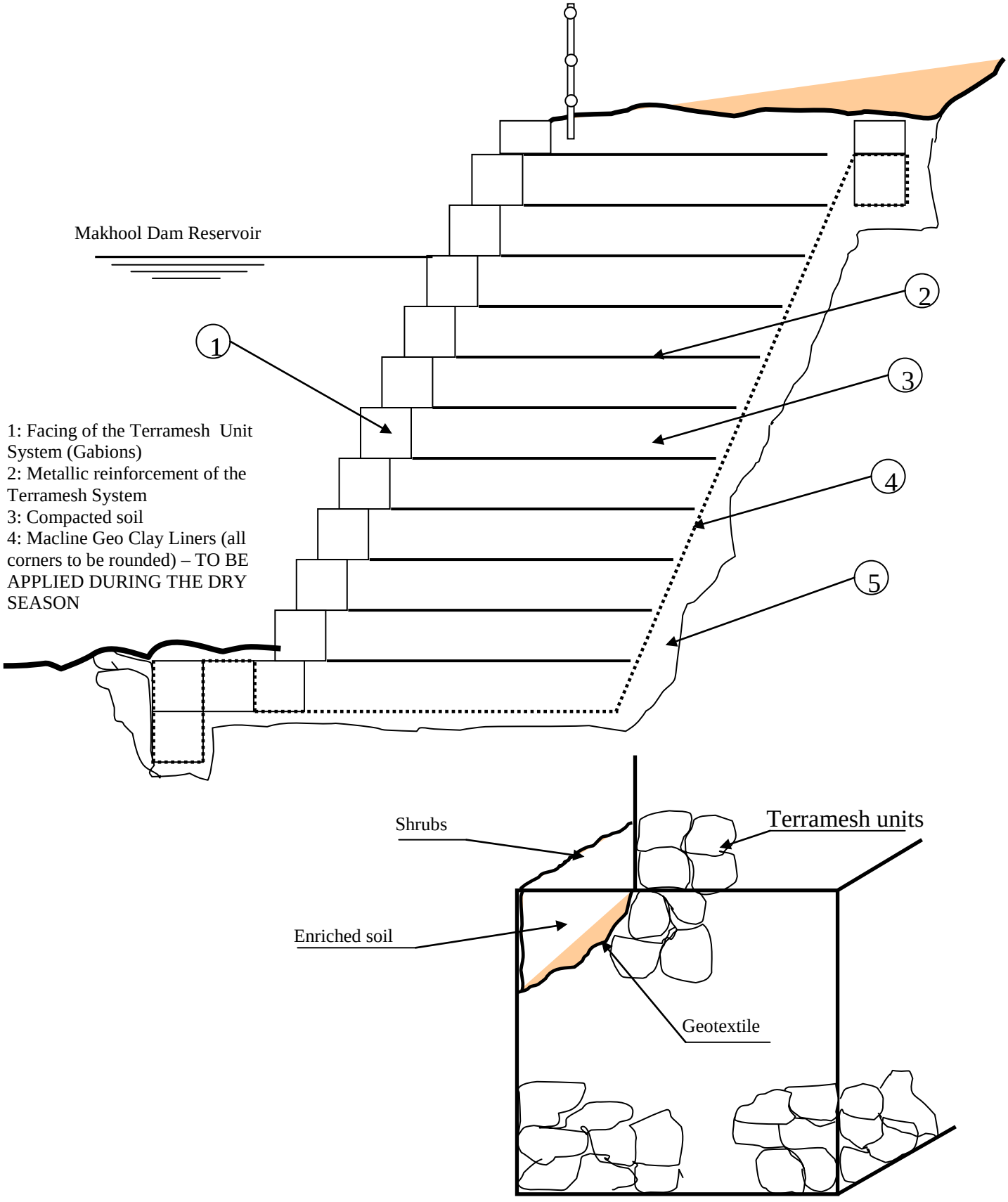
It is therefore necessary to insert an impermeable element at the rear and in the foundation of the Terramesh protection to explete this function. This may be conveniently carried out by the use of MACLINE Geo Clay Liners, a geosynthetic clay liner with natural (sodium) bentonite, as used for example, in the waterproofing of landfills, in channel linings and retention basins.

The MACLINE Geo Clay Liners are laid on a suitable compacted base and must be anchored adequately both at the top of the slope and at the base in a suitable trench. The junctions of the sheets of MACLINE Geo Clay Liners are obtained by overlying the sheets at least 15cm laterally and at least 60cm longitudinally and bentonite mastic used to render the joints impermeable.

The attached FIGURE 6 overleaf shows a typical solution of what has been described above.

Rough costs, to be verified with the Iraqi counterparts, are of the order of $USA 1000 per metre square of slope protection for a total cost of the order of some $USA 20 million.

TYPICAL TERRAMESH PROTECTION WITH MACLINE GCL LINER --- ***FIGURE 6***



Other Interventions

In addition to the protection of the whole site of Ashur from the waters of the future reservoir, it may be necessary to protect certain specific areas where the archaeological excavations have been carried out and/or for future excavations to greater depths, in view of the future rise in groundwater levels throughout the area.

One possible type of intervention consists of **sand drains** around the periphery or perimeter of the excavations. Such sand drains would be constructed by drilling large diameter holes (up to 1 m in diameter) to the depth necessary to de-water the excavations, and by backfilling these holes with free-draining material, suitably graded, and protected with geotextile sheets to avoid migration of the finer particles of the site material into the drains and clog or choke them up. The underground waters would then tend to migrate to these drains and rise to the top from where they would then be collected by a surface system of drains and carried away from the excavation site.

As an ultimate solution to the problem of dewatering the foundations of the archaeological excavations, the use of **sump pits and pumps** may be indicated for those areas where the problem with the higher groundwater levels is of a temporary nature and not persistent. The excavation of suitably dimensioned sump pits with bottom levels well below the archaeological excavation levels and/or the groundwater levels, is indicated in any case for the collection of rainwater and surface waters which tend to collect in the various excavation sites.

ANNEX 1: **PHOTOGRAPHS**

Photo No.1: Tigris river to the north-east of Ashur showing confluence of old branch with new course of the river

Photo No.2: Tigris river to the east of Ashur showing use of river water for irrigation and other purposes

Photo No.3: Tigris river to the east of Ashur showing formation of islands on the left bank upstream section of the main stream

Photo No.4: Tigris river to the east of Ashur showing formation of islands on the left bank downstream section of the main stream

Photo No.5: Upstream eastern escarpment of the Ashur promontory sloping down to the Tigris river

Photo No.6: Central eastern escarpment of the Ashur promontory, at location of the guest-house, sloping down to the Tigris river

Photo No.7: Downstream eastern escarpment of the Ashur promontory, showing remains of an old well, with near vertical face down to the Tigris river

Photo No.8: Downstream eastern escarpment of the Ashur promontory with near vertical face down to the Tigris river, showing effects of gully erosion

Photo No.9: Downstream eastern escarpment of the Ashur promontory sloping gently down to the Tigris river, showing extensive gravel deposits

Photo No.10: Downstream south-eastern escarpment of the Ashur promontory sloping gently down to the Tigris river, showing sand and other fine material deposits

PHOTO No. 1

PHOTO No. 2

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PHOTO No. 3

PHOTO No. 4

PHOTO No. 5

PHOTO No. 6

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PHOTO No. 7

PHOTO No. 8

PHOTO No. 9

PHOTO No. 10