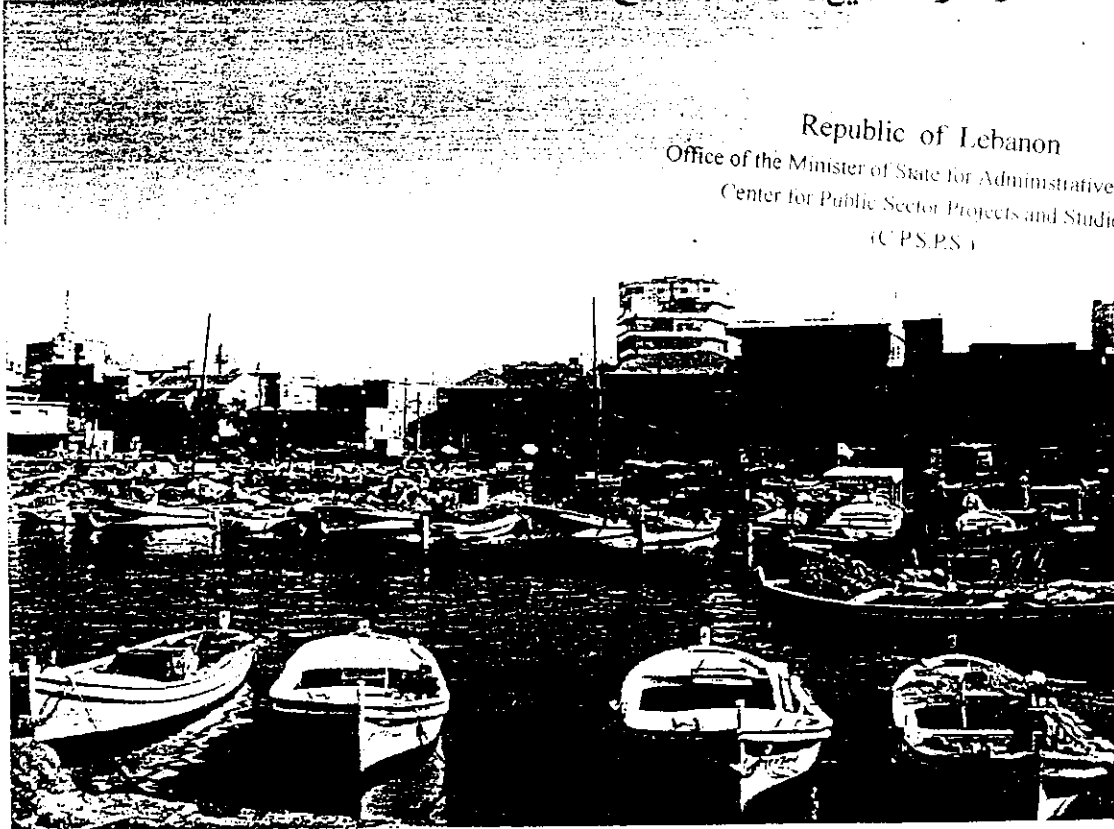


REPUBLIC OF LEBANON
COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION

Feasibility Study for a Touristic Port for
the City of TYRE, South Lebanon

الجمهورية اللبنانية

مكتب وزير الدولة لشؤون التنمية الإدارية
مركز مشاريع ودراسات القطاع العام



Republic of Lebanon
Office of the Minister of State for Administrative Reform
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(C.P.S.S.)

Summary and Analysis Report

June 2001



DAR AL HANDASAH NAZIH TALEB & PARTNERS Consulting Engineers

دار الهندسة نزيه طالب وشركاه للتصميم والاستشارات الهندسية

In association with SOGREAH

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INTRODUCTION

The present summary report has the goal of focusing on and bringing together the main project's ideas and concepts that were identified, researched then evaluated from many angles. The report is a final effort, before proceeding to the conceptual design phase of one selected alternative, to try bringing to surface what could be the best alternative for the challenging Tyre touristic port project, challenging since the constraints faced by the feasibility study so far have been multiple and complex. The decision that has to be taken from here on has to be carefully evaluated, not only from the Consultant's side but also from the Client's side, as each project alternative studied so far, has to be weighted carefully for its positive and negative aspects alike in order to achieve the goal of the Tyre port project while preserving the city's rich heritage. In 1984, Tyre has become a UNESCO World Heritage Site upon the request of the Lebanese Government. We have thus tried, in this report, to present facts and analysis and data as objectively as one can with, in mind, one obsession: that of trying to highlight what we believe is the best option for the context of the Tyre touristic project, bearing in mind the reason why this project was started, the historic aspect of the city and the needs of the economy of the region, all that from a "sustainable development" perspective. In order to help the decision makers guide the project's subsequent phase by selecting the most suitable alternative, the Consultant has closed the present report with a Decision Matrix. It is also advisable, at this stage, to bring all concerned active parties together before a final decision is made concerning the selection of one alternative.

The decision will not be an easy one, nor will it be a clear, see-through choice. That is why we recommend that the authorities involved be consulted and the facts presented to them objectively in order to be able to reach a consensus that will allow Dar Al Handasah and Sogreah to move forward with the conceptual design of the Tyre touristic port and carry out its financial feasibility assessment. It is also important to note that no one independent project should be carried out for the Tyre port before the present global touristic port project feasibility study is finalized.

PROGRESS MILESTONES

This chapter lists, here below, headlines for the main events that have so far constituted progress achieved for the Tyre touristic port project.

- Initialization of the project - Meetings with concerned parties – Meetings with authorities that could provide helpful information for the project - Spreading the concept of the project and collections of feedbacks and reactions.
- Visits of ports expert firm Sogreah (France) to the Lebanese coast and to the potential sites for the Tyre port - Meetings with different parties – Field survey of other ports and marinas along the Lebanese coast to assess the potential market for the Tyre touristic port project.
- Preliminary assessment of available options in view of experts' opinions and concerned authorities' perspectives.

- Another round of meetings with concerned authorities to brief them on preliminary assessment and difficulties encountered and to brief them on other authorities' points of views namely those with basic differences with their own opinions.
- In the absence of a clear alternative to be carried out for the Tyre touristic port project, decision was made to carry out a comparison between two main alternatives, namely creating a new port outside Tyre (in the Mheilib region around 4 km North of Tyre – the site being in a public domain and falling in a natural bay area) and rehabilitating / extending the actual Tyre port to accommodate a well organized pleasure boats area – The Consultant had to get approvals of all actively concerned authorities to carry out such a comparison study (with a promise to brief them all with the results of the comparative study in all its aspects).
- Meetings with the DGA to launch an archeological exploration campaign outside the actual Tyre port right next to the existing breakwater and in the Mheilib proposed port location - Exploration campaign was carried out according to standards agreed upon by UNESCO.
- Site Exploration campaign was also carried out in the two sites (Tyre port and Mheilib area) whereby required physical data was gathered and measured - Campaign involved underwater seabed borings, bathymetric survey, marine survey and others.
- Environmental Impact assessment was carried out for the two sites.
- Archeological / Cultural Impact assessment was carried out for the two sites.
- Socio-economic survey was carried out in the Tyre area to measure perceptions and attitudes in regards to the Tyre touristic port project and its preferred location and also to survey perceived benefits of such a project with regards to the local community and the local economy.
- Meetings with all concerned parties and bodies whose recommendations should be taken into consideration for the Tyre project.
- Careful consideration of all factors that make for the reputation of Tyre
- Identification of major parties concerned and specifically parties whose support is important for the success of the port project - Some parties concerned have no real objection to any solution (their only concern would be for the study to be carefully and seriously carried out) while other parties have specific opinions regarding the project (example: DGA, UNESCO, Board of actual Tyre Port and Tyre Municipal Council).
- Identification of main attitudes and perceptions of parties concerned. These attitudes and perception will play key roles in the final decision since this vital project for Tyre would not be successful if it does not get the full support of the major parties concerned.

REVIEW OF PHASES CARRIED OUT – Conclusions Relevant to Decision Making

This chapter briefly presents the project phases carried out by the Consultant so far; it also retains, from each phase, relevant conclusions that will help the decision making process for the subsequent phases. The presentation of information tried to achieve as

much objectivity as possible in order for the project to be of maximum benefit to the city of Tyre and its people.

Review and integration of previous, planned, ongoing and future studies

Previous, planned and ongoing studies related to the Tyre touristic port project, were collected and carefully reviewed. The main studies collected were:

- Urban master plan for Tyre and its surroundings
- Urban master plan for Tyre – Analysis and propositions / recommendations (UNESCO – 1998)
- Water and wastewater study for Sour drainage zone
- Oceanographic survey
- Sour coastal area wastewater studies
- Extension of Tyre port harbor and marine structures
- Urban conservation and design studies for Tyre old city
- Regional socio-economic development program for south Lebanon
- Action plan to launch the international campaign for the safeguard of Tyre
- Underwater exploration of archeological sites
- Advice for the ancient harbor of Byblos in Lebanon and the preliminary new harbor extensions
- Summary of Unesco mission reports 1980-1991
- A historical / archeological overview of Tyre

From reviewing the above studies and reports, the main noted items that are relevant to the Tyre port project are as follows:

- Recommendations from UNESCO not to adopt the proposed new touristic port proposed by the Tyre Urban Master Plan Study. The new port was proposed to be adjacent to the actual port.
- Recommendation from UNESCO not to allow any major new infrastructure construction in the surroundings of the actual Tyre port whether on land or in the water since this will endanger the famed classification of the city of Tyre as a World Heritage Site (as of 1984); this same classification was requested to UNESCO by the government of Lebanon.
- A wastewater treatment plant is planned around 3 kilometers to the North of Tyre, on the seafront.
- The economy of Tyre is not doing well and studies were carried out to study ways to revive it.
- A natural reserve to the south of Tyre was created and a decree issued for that purpose. There is a need to preserve the natural state of the Tyre coast in general.
- An urban conservation study to preserve Tyre old city was carried out among others. The importance to preserve the cultural heritage of the old city and its waterfront are an evident necessity for future generations.
- An international action plan was elaborated to safeguard Tyre from chaotic urbanization and preserve its cultural heritage. The plan relies on the

- importance of protecting the historic heritage and the fascinating archeology from long term partial or total destruction.
- In the 1930s, underwater archeological explorations were carried out, driven by the richness of heritage of Tyre.
 - With similarity of cases in mind, the study of the extension of the ancient harbor of Byblos was reviewed.
 - Other UNESCO and international missions highlight the importance of preserving the rich cultural heritage of Tyre.

Collection of information and use of previous surveys

Collection of information and previous survey data included the following:

- Climate in Tyre
- Law decrees
- Aerial photographs
- Zoning map
- Oceanographic survey
- Social survey
- Agricultural maps
- Geological survey
- Hydrographic maps
- Cadastral map
- Land use maps

To be noted are the following:

- The climate and sea conditions at Tyre are favorable for boating.
- The actual Tyre port has a definite fishing / fishermen character.
- No special physical conditions were found out to be a serious handicap for the Tyre touristic port project whether in Tyre or a little outside it.

Coordination with authorities

Many meetings, visits and contacts were carried out to get the views of the different authorities and active players in the Tyre touristic port project. The purpose of those meetings was also to inform the parties of the project phases and methodology underway. Some of the meetings brought helpful information to the consultant. There are also contradictory points of views of some of the authorities consulted. The parties the consultant met with (other than at CDR – Council for Development and Reconstruction) were:

- Tyre Municipal Council
- Tyre Municipal Council – Planning and Study Committee
- Direction Générale des Antiquités
- Direction Générale de l'Urbanisme
- UNESCO
- Board of the actual Tyre port
- Tyre Fishermen Syndicate

- Ministry of Public Works and Transportation
- Ministry of Tourism
- Ministry of Environment
- National Marine Center
- Bhanes Observatory

The effort provided through the diverse meetings had the effect of uncovering information detrimental to the project and shedding light on the project as it is progressing through informing those diverse parties of steps taken and registering, for future reference, their comments and objections if any.

The consultant concluded from the above that the fishing activity is vital to the well being of the city of Tyre, its tourism industry and its local economy in more explicit terms. Furthermore, the Municipal Council of Tyre would like to see the Tyre touristic project happening in Tyre not outside it, so does the Board of the actual Tyre port. The DGA and UNESCO cautioned about any new construction in the vicinity of the actual Tyre port, since that would present serious short term and long term dangers to the rich heritage of the city and would endanger its famed classification as a World Heritage Site. Finally, Tyre fishermen expressed deep concerns about seeing their vital space in the present harbor compressed. Plans of extensions to the actual commercial harbor were underway; these were seriously cautioned against by the DGA for fear of endangering the city's rich heritage. In the consultant's opinion, there should be no one independent project carried out for the Tyre port before the present global Tyre touristic port project feasibility study is finalized.

Archeological exploration

With the consent and under the supervision of the DGA, a small team of archeologists / divers was hired to carry out an underwater archeological survey according to a methodology agreed upon by UNESCO and by a foreign seawater archeologist. The survey addressed two sites:

- Just outside and around the actual Tyre port breakwater
- Mheilib region around 4 kilometers north of Tyre

Photographic pictures were taken, the exploration methodology well stated and the results examined by the DGA and the foreign seawater archeologist.

The conclusion is that the actual Tyre port area is rich in archeology and historic ruins underwater. As for the Mheilib site, the underwater environment did not seem to carry much archeological richness.

Site exploration and physical conditions

Site exploration and physical data collection and analysis were performed for two potential project sites: the actual Tyre port site and the Mheilib site north of Tyre. Physical data collected and analyzed related mainly to wind, waves, water levels,

currents and climate. The site exploration campaign included mainly bathymetry, surface geological survey, ground survey and geotechnical investigations.

In reference to the results of works carried out, the following conclusions can be drawn for the potential sites:

Geographic location, space availability and access requirements

Mheilib Site

The following points should be taken into consideration for a new port at this site:

- Need for enlargement, rehabilitation and modernization of the existing access road between the main road and the port location. The length of this road is about 1.3 km. The enlargement and rehabilitation of this road will need the expropriation of parts of the privately cultivated lands around this road.
- Need for rehabilitation of the main road between Mheilib region and Tyre city and for the creation of a transport system in order to facilitate the movement of visitors and tourists between the port and the archeological tourist sites in Tyre.
- No infrastructure is currently present in the region; thus new infrastructure should be coupled to the new port project.
- The port facilities can be constructed on the beach area in public parcel No. 120; however, many illegal houses are already constructed on this parcel and should be removed prior to the construction of the port facilities.
- The capacity of this port could be important.

Actual Tyre Port Site

The following points should be taken into consideration for the option of rehabilitating / extending the actual port:

- Access to the port is quite easy.
- Access from the port to the archeological tourist sites in Tyre is quite easy.
- Existence of an infrastructure system in the port area.
- Area available for port facilities is limited.
- No land expropriations are needed.
- New mooring capacity will be limited and boats can become overcrowded

Bathymetry

The proposed port site at Mheilib has very shallow water and that for a considerable distance going into the sea. Thus, the new port breakwater will have to be quite long to reach into acceptable water depths for boats. A large volume of rock excavation has also to be part of the overall picture.

In the actual Tyre port area, the bathymetry is suitable for any extension or development works on condition to dredge into the existing accumulated sedimentation.

Geological and geotechnical

The seabed soil in the Mheilib region is composed mainly of a top layer of sand 1.5 to 2 meters thick, followed by a rock formation composed mainly of limestone or sandstone. These geological formations make that any kind of excavation will be difficult and costly to achieve. Nevertheless, the seabed would constitute a sound foundation for any rigid structure.

As to the foundation soil in the existing port region, it is composed of a top layer of 6 meters thick made out of fine sand with silt. Beneath this top layer, a formation of sandy clay 2 to 7.5 meters thick rests on top of rock layers made out of sandstone covering the limestone. Those soft formations require construction using them as foundation to be light, floating or to have a deep foundation (example: piles).

Wind, currents and waves

The coastline in the Mheilib region seems to be perpendicular to the incoming waves. There are no particular natural defenses, except for the underwater topography of the seabed. Furthermore, the collected information related to winds, currents and waves show that the proposed port in the Mheilib region will be subject to effects of the natural elements with a more accentuated degree than for the actual port. Thus, it could be necessary to have a sizeable breakwater at this location.

Sedimentation

Sedimentation seems to be more significant in the existing port area than at the proposed Mheilib port site. Thus, maintenance by dredging will probably be more needed in the existing port area than at the Mheilib site.

Socio-economic assessment and analysis – Phase one: Assessment of potential markets

The first phase of the socio-economic assessment included a field survey performed by a foreign marina economist expert and included most of the Lebanese coast. The results are a pleasure boat market for Tyre of around 100 places. This assessment comes from a purely economical point of view and without further considerations. The report also recommends the port project to be inside Tyre.

Socio-economic assessment and analysis – Phase two: Social survey and assessment

The second phase of the socio-economic assessment included a field survey of respondents selected from the Tyre area. The analysis of the survey yielded results showing an appetite of the respondents for the port project and a preference for the port being inside Tyre.

Environmental impact assessment

The EIA recommends not creating a new port outside Tyre since it will lead to considerable environmental damage in a pristine and still undisturbed area. Furthermore, the EIA recommends either extending the actual Tyre port after careful

salvaging of the underwater archeological ruins at the location of the extension (a costly and lengthy proposition) or going for the rehabilitation of the existing Tyre port. The final recommendation is for the rehabilitation of the actual Tyre port.

Archeological / cultural heritage impact assessment

While the archeology in Tyre makes it delicate to carry out any infrastructure project close to the ruins, it is also true that a port outside Tyre will not help to attract tourists to visit the archeological ruins. The AIA study concludes with the recommendation of not creating a port outside Tyre but also not to carry out extensions to the actual Tyre port. The AIA recommends rehabilitating the existing Tyre port to accommodate new pleasure boats mooring places.

DECISION MATRIX

From data and information gathered, previous and ongoing studies reviewed, coordination and research meetings conducted, foreign experts visits and assessments, socio-economic field surveys and assessments carried out, marine site exploration campaign undertaken, diverse impact assessment studies done, evaluating differing attitudes of concerned authorities:

The consultant comes to the conclusion that the selection of an alternative for the Tyre touristic port project is not a clear choice and that in order for the project to be successful, it needs a minimum level of authorities and public support, only achievable through briefing those authorities of the results of the study phases carried out so far (as promised to them earlier on) and through constructive consultations that will lead to the choice of an alternative which enjoys the needed level of support.

Within an organized decision matrix, we have presented, here below, the results of the different components of the study and that for the options of "just rehabilitating the existing Tyre port", "extending and rehabilitating the existing Tyre port" and "creating a new port outside Tyre in the Mheilib area".

The Decision Matrix follows here below:

	OPTION 1: Rehabilitation and Redevelopment of the existing Tyre port	OPTION 2: Extension of the existing Tyre port's breakwater eastwards	OPTION 3: New port at the Mheilib site outside Tyre
<i>Socio-economical Benefits for Tyre</i>	Very good	Good	Not so good
<i>Tourism Attraction for Tyre</i>	Very good	Fair	Not so good
<i>Number of new boat places that could be accommodated from an Economical perspective</i>	Around 100	Around 100	Around 100
<i>Number of new boat places allowed from a Cultural Heritage / Archeological Impact perspective</i>	30	30	N.A.
<i>Archeological / Cultural Heritage Impact assessment</i>	Acceptable Impact	Not Acceptable Impact	Acceptable Impact

Environmental Impact :			
<i>1-Marine Habitats</i>	No impact	Some negative impact	Negative impact
<i>2-Upland Habitats</i>	No impact	No impact	Negative impact
<i>3-Dredging Effects</i>	No impact	Some negative impact	Negative impact
<i>4-Water Pollution</i>	Positive impact	Negative impact	Negative impact
<i>5-Disturbance to fishing activities</i>	Some negative impact	Some negative impact	No impact
<i>Conclusion of Environmental Impact</i>	No impact	Some negative impact	Negative impact
Geographic Location, Space Availability and Access Requirements :			
<i>Access to the port</i>	Existing	Existing but will bear additional traffic due to increased no. of boats	Not existing – Need for new access road
<i>Access to Tyre's tourist sites</i>	Very good	Good	Distant
<i>Port Infrastructure</i>	Need for rehabilitation	Need for additional infrastructure and rehabilitation of existing	Not existing – Need new infrastructure
<i>Port facilities area</i>	Need for rehabilitation of existing area	No additional space available – Also need for rehabilitation of existing area	Available
<i>Basin Surface</i>	Good for a small number of small boats only	Good	N.A.
<i>Boat Crowding</i>	Acceptable for a small number of additional boats	Acceptable for an average number of additional boats	Not of concern
<i>Land Expropriation</i>	Not of concern	Not of concern	Expropriation is needed

Physical Conditions :			
<i>General Bathymetry</i>	Suitable	Suitable	Need for long breakwater and important underwater rock excavation volume
<i>Water Depth</i>	Good for small boats only	Good for small boats and for yachts	Shallow ==> Bad Condition
<i>Protection against Waves</i>	Existing breakwater is mainly sufficient	Need for an extension of the existing breakwater	Need new breakwater
<i>Geological and Geotechnical conditions</i>	Soft Soil	Soft Soil - Foundation has to consist of light structures (but danger of archeological ruins damage)	Suitable sound foundation
<i>Sedimentation</i>	Significant	Significant	Not significant
Cost :			
<i>Construction Cost</i>	Low cost	Medium cost (new breakwater)	High cost (rock removal + new breakwater)
<i>Relative Operation and Maintenance Cost</i>	Medium	Medium	Low

ANALYSIS AND CONCLUSION

After looking at the decision matrix, one can see that the choice of project should probably be between Options 1 and 2 and that, furthermore, the number of new boats to be accommodated is still not clear due to a difference concerning the number of suggested new mooring places from the following perspectives:

- 1) Archeological / Cultural heritage and economic benefits derived from cultural tourism perspective,
- 2) Purely economical perspective.

If the conclusions of the study so far had exhibited a clear choice that would get the support of major parties concerned, a recommendation of Dar Al Handasah to CDR would have been quickly elaborated and presented for approval and in order to carry out the final phase of the project. However, and since the possible alternatives identified by the consultant, and that after exhaustive analysis of all possible choices,

do not go hand in hand with a good level of support from major parties involved, it would be risky for the project to go ahead without a fair pause and consultations with those parties with the aim of bringing diverging views closer together so that a consensus reasonable to all could be arrived at.

In conclusion, consultations should be made with the active authorities concerned by this project for a final decision to be made. An effort should be made in terms of presentations and meetings with all concerned parties to be able to reach a consensus reasonable to all for Dar Al Handasah to be able to move on to the final phase of the project (conceptual design and financial feasibility).

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Archeological / Cultural Heritage Impact Assessment
June 2001



DAR AL HANDASAH NAZIH TALEB & PARTNERS Consulting Engineers
دارالهندسة نزيه طالب وشركاه للتصميم والاستشارات الفنية

In association with SOGREAH

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ARCHEOLOGICAL / CULTURAL HERITAGE IMPACT ASSESSMENT

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1. INTRODUCTION

1.1. Aim of the study

The present study aims at assessing the impact of a proposed Tourist Marina construction project on the cultural heritage of the city of Tyre and its region. Two potential locations were suggested for the marina: the first one lies in the area of the present harbor of Tyre, while the second is situated at the nearby locality of Mhailib (ca. 4 kms north of the city of Tyre). The project's rational resides in the likely benefits that could result from the construction of the marina on the economy of the area, the development of cultural tourism and the creation of associated employments profiting the local populations of the region. The main factors that determine the viability of this project are:

- The environmental beauty and natural potential of the area.
- The valuable cultural heritage of Tyre and its region.
- The location of the city on the Mediterranean coast, its central position and easy accessibility.
- The international fame of the city and its cultural status as World Heritage Site.
- The developing potential of cultural tourism in the country and the area in the context of a sustainable environment and resources.

Based on these factors, the construction of a tourist marina in the area of Tyre is regarded as an important step for the creation of an infrastructure for cultural tourism. If managed properly, the proposed marina will help promote the area culturally, upgrade its urban environment, help conserve its natural and cultural resources and benefit its population in a sustainable form.

In this specific context, the present study will attempt to fulfill the following tasks:

- Investigate the main factors favoring the construction of a tourist marina in the area of Tyre.
- Determine the basic requirements for a functional tourist marina.
- Review UNESCO's past and present efforts for the preservation and safeguard of the heritage of the area in collaboration with the Lebanese Department of Antiquities.
- Discuss the potential integration of the tourist harbor project with the plans for heritage conservation and tourism development at Tyre.
- Assess the value and importance of the cultural resources in the Tyre area.
- Assess the various impacts such a project can have on the cultural resources of the area.
- Propose a sustainable land use scheme for the Tyre harbor in the context of a heritage conservation and cultural tourism development plan.

The scope of this document is restricted to providing management guidelines for the harbor area of Tyre. However, since such a project cannot be conducted outside the context of the entire historic city, several sections of the report attempt to explain the importance of the cultural resources of Tyre and its area, as well as try to identify the role and significance of the harbor area in the framework of an overall cultural tourism management plan.

The present document is consequently a useful tool to empower the decision making process of the responsible authorities with respect to the following issues:

- Whether it is viable to implement a tourist marina project.
- Where to locate the proposed marina.
- How to avoid or mitigate the negative impacts such a project can have on the cultural resources of the area.
- How such a project can contribute to the upgrading of the urban and natural environment of the area.
- How to integrate the project with the various plans and efforts for the conservation of heritage and the development of cultural tourism in the region.

1.2. Why a tourist marina at Tyre

The purpose of the Tourist Marina is to make accessible the cultural and natural resources of a place to a larger class of people and to revitalize the local economy of the region. Consequently, it must not jeopardize the same resources it pretends to make available for people's enjoyment. The creation of the marina will help develop and boost tourism in the Tyre area and in the liberated territories as a means of improving the socio-economic conditions of this part of Lebanon. Tyre is a multi-faceted tourism package of historic and archaeological importance; it possesses a huge cultural tourism potential with underwater resources, sun and beach tourism, and a strong historic legacy with rich traditions and folklore, crafts and natural beauty. Tyre enjoys a moderate climate throughout the year, a special natural landscape, a strong mythical background and a unique aesthetic value. Moreover, the fame of Tyre as World Heritage City increases the tourist potential of the place. The tourist marina project at Tyre will service the process of attracting visitors to the area. It is an important infrastructure need targeting Mediterranean tourism.

1.3. Prerequisites of a tourist marina

The necessary prerequisites of a tourist marina can be grouped under two major categories, physical requirements and management requirements.

The physical prerequisites involve:

- Infrastructure needs such as availability of hotels or other types of accommodations, restaurants, cafeterias, public toilets, pedestrian streets, gardens and other green spaces, cultural attractions, museums, cultural centers, bookshops, libraries, tourist information office and stands as well as other tourist related facilities such as travel agencies, rent a car offices, etc. Other possible complementary facilities could be sport centers, sailing clubs, tennis courts, etc.
- Infrastructure needs for boats docking, maintenance, refueling, electricity, etc...

Management requirements involve:

- Drawing a tourism strategy for the marina, evaluating the type and number of tourists expected and ways of dealing with them. It is also important to win local community support and make people aware of the importance of tourism for the city and the area in general. In order to draw such a strategy, local authorities should cooperate with the other partners like the Ministry of Tourism the DGA, DGU, the fishermen's syndicate, UNESCO, tour operators and travel agencies as well as other stakeholders like the inhabitants of the Old City and the owners of properties on the seafront.
- Special facilities are needed in order to provide tourists with good quality service. They can be summarized to a tourist information service, tour guides, proper public transportation, health and sanitary services, proper lighting and security as well as cultural activities which could take place at the marina itself such as theatre plays, sport competitions, children's activities, festivals, evening performances and other open-air activities.
- Sustainable cleaning program for the fishermen harbor and eventually for the tourist marina.

Note: The above requirements should also not neglect the need to upgrade the fishermen harbor. This upgrade should be accomplished in the context of the tourist marina and the overall rehabilitation of the existing harbor of Tyre.

2. HERITAGE CONSERVATION AND TOURISM DEVELOPMENT AT TYRE

2.1. Importance and value of Tyre

Tyre is a historic city with a unique and authentic cultural inheritance. It was accordingly designated as World Heritage Site in 1984 by the international organization UNESCO. The vestiges of millennia of human occupation and the succession and achievements of different civilizations have given Tyre its special character and a considerable wealth in cultural resources. This wealth is evident in the archaeological and historic remains reminiscent of great civilizations like the Canaanite, the Phoenician, the Hellenistic, the Roman, the Islamic, the Crusader and the Ottoman. The cultural mélange juxtaposed with the natural beauty of the area have created a place where man can reflect

upon his past, wonder about the achievements of previous civilizations, merge with the local culture and its rich inheritance, and interact with the physical and legendary legacy of the place. Tyre is a unique place with a cultural significance suggestive of a number of values; these values are listed and explained below. The cultural significance of Tyre is a statement detailing the importance of the city and defining the values that need to be respected, preserved and enhanced in the context of a conservation and tourist development approach to the city.

2.1.1. A city with a special heritage value

Tyre is a city with an urban history stretching back to the 3rd millennium BC. The different civilizations that left their marks on the history and the urban character of the city have contributed to the formation of a unique and authentic heritage depicted in surviving monuments ranging from luxuriously decorated funerary sarcophagi and complexes, churches and cathedrals, triumphal arches and major colonnaded streets, aqueducts, basins and large water installations, hippodrome, palaestrum or agora, bathes and pools, etc. The international recognition of the importance and richness of this heritage culminated in 1984 in the nomination of Tyre as a world heritage site. Since then, Tyre has been the focus of international interest and efforts are currently being made to launch an international campaign for the safeguard of the city and its cultural landscape.

2.1.2. A sacred place

Associated with the veneration of the Canaanite-Phoenician god Melquart (Heracles), the city gained a wide fame in the ancient world and was an important religious center that attracted many pilgrims. Even Alexander the Great himself expressed his wish to present offerings to the Phoenician god of Tyre. The location of the temple of Melquart remains until today undiscovered, it is believed to be situated on the ancient island city site.

2.1.3. A biblical place

Mentioned in the Holy Bible and associated with the sacred journeys of Jesus Christ and the history of St-Peter, Tyre and its area are important stages on the pilgrimage road to the Holy Land. Such a tradition is reflected in the numerous Christian sanctuaries in the city like for instance the early Christian church of the 4th century, the crusader cathedrals and later churches and religious centers scattered across the old city. In the Medieval period, Tyre was an archbishopric center and its history during that period was documented in detail by its archbishop William of Tyre. The important role it has played in the struggle between Crusaders and Muslims can still be traced in military and religious installations in the city and the area.

2.1.4. A place of natural beauty

Tyre is endowed with a picturesque natural environment with a rich natural diversity. From long sand beaches to forested areas and agricultural lands, the

charm of these green areas is increased by the warm glow of the ruins of the Roman and Byzantine period as well as by the traditional sandstone architecture which merges beautifully with the coastal environment. The rich variety of fish and wild animals constitutes an important resource that should be protected. The creation of a natural reserve to the south of Tyre is the first step towards the appreciation of these resources and their conservation for future generations.

2.1.5. A place of decay

Archaeological remains and historic monuments of different ages found within the archaeological sites, inside the Old City, in the surroundings of Tyre and underwater are not only surviving testimonies of a distant past, but also philosophical statements reflecting the powerlessness and incapacity of man in front of the will of God and nature. The traces of great civilizations and the remote history of populations which lived and died at Tyre are strongly evident in the monuments they have left behind and in the cultural legacy the Tyrians still carry with them in their daily lives. The remains that reveal the achievements and aspirations of previous nations leave us deeply contemplative of the role we play in this current life and the position we occupy from the modern world.

2.1.6. A fishermen's city

Fishing was and still is one of the main occupations of the inhabitants of Tyre. This traditional occupation is still a center of focus in the old city and the source of livelihood for a substantial number of Tyrian families. Apart from being the center of a vivid social activity, fishing and associated events are a major tourist attraction and a strong determinant of local identity.

2.1.7. An important trade center

Tyre's trade importance is the consequence of the important commercial relations the city established with its various colonies across the Mediterranean and with trade cities all across the ancient world. Tyrian traders traveled by sea from their city as far west as the Atlantic coast and to the southeast as far as the Arab Gulf. Several trade posts were established to facilitate the transfer of goods from and to Tyre. The great wealth accumulated from intensive trade activity was obviously reflected in the architecture of the city. This flourishing activity was not restricted to the Phoenician period, but was rather a long term phenomenon which was continued to the Medieval period where Tyre was one of the main harbors of Damascus and an important link for the exchange of exotic produces from the east like spices, damascene textiles, glass and ceramics, unguents, etc.

2.1.8. A place of cultural interchange

Tyre has always been a point of contact between east and west. Its favorable location and its mediating role drawing together the worlds of the Orient and the Occident gave the city a unique history and a cultural environment unique

to the area. The cultural richness and diversity of Tyre is the result of the mixture of civilizations responsible for spreading the alphabet, establishing a common culture across the Mediterranean, creating cultural and commercial links between the various kingdoms of the ancient world, and contributing to the advancement of script, history, philosophy, fine crafts, architecture, and technology. Tyre carries a message to the world, a message of a shared rich cultural legacy emanating from a distinctive local identity.

2.1.9. A rural place

The rural and agricultural environment of Tyre is an intrinsic part of the urban and historical setting of the city. Tyre could not have developed without its countryside and its rich produces. The preservation of the rural character of the Tyrian countryside is essential for the conservation of the significance of the historic city. The agricultural fields and orchards surrounding the city contribute to the aesthetic value of the place.

2.1.10. A legendary place

Tyre is associated with a number of legends and myths that reflect the way ancient civilizations interpreted natural phenomena identified their position from the cosmos and explained important aspects of daily life. Legends like the abduction of Elissar (Europa) by Zeus and the creation of the European continent, the flight of Cadmus and the founding of Phoenician colonies, the accidental discovery of the purple dye, the imperial purple, and others as well, are testimonies to the central role of Tyre in the history of civilizations and the shaping of the ancient world.

2.1.11. A harbor city

Tyre is a harbor city with a long tradition in fishing, sea faring, conquest and trade. The harbor plays an important role in the socio-economy and cultural development of the place giving it this special character that is particular to harbor settlements. The history of the Phoenician people with the sea as central element is still alive in the remains preserved underwater and in some of the modern installations of the present day harbor. Sections of the Phoenician, Roman, Medieval and Ottoman harbor installations form a dynamic resource of unique importance which requires proper treatment and evaluation as well as integration in order to make it accessible to people's enjoyment and appreciation.

2.1.12. A place of festivities

The various monuments dedicated to festivities and public activities like the hippodrome, the palaestrum, the Roman public pool, the modern football field and other facilities in the city detail the central importance of public entertainment and communal leisure to the populations of Tyre, past and present. The annual Tyre festival can be regarded as a present manifestation of an age-old tradition. It attracts people from all over Lebanon and from other countries as well. It is to be regarded as a cultural demonstration of the rich heritage of the city.

2.1.13. A craftsmen's city

Tyre was famed for the fineness of its luxury products and the quality of its craftsmanship. The exquisite value of ivory items, silver, glass and purple dye textiles was appreciated by the ancient world and the products were carried over long distances by Phoenician traders. Although some of these crafts still survive until today in the old markets of Tyre, their preservation and revival are essential for maintenance of cultural links with past.

2.1.14. A place of local resistance and military history

Tyre is a city proud of its local identity and character. It is also conscious of the role it needs to play in the politics of the time and place. The sieges of Tyre by Nebuchadnassar and Alexander the great and the refusal of the latter to capitulate under the threat of death by the sword are examples of the determination of the inhabitants of this city to stand strong in front of the oppressor and to resist the aggressor. This age old determination exhibited itself again in the resistance of the Tyrians and of the populations of south Lebanon to the Israeli aggressor and the victory of their free will over the destructive armada of the enemy.

2.2. Summary of main UNESCO efforts for the safeguard of Tyre

The inclusion of Tyre on the World Heritage List is a direct consequence of the International recognition of the importance, uniqueness and richness of this heritage. The Lebanese Government, the party responsible for submitting the application for World Heritage nomination, agrees to abide by the terms of the World Heritage convention with respect to the protection and conservation of the World Heritage city. UNESCO is consequently a main partner in the monitoring and protection of the site. In fact, since 1982, UNESCO has been active in the following fields of inquiry with respect to Tyre:

- Assessment of the extension, nature and value of the heritage of Tyre.
- Protection of archaeological sites from armed conflicts.
- Evaluation of the various human and natural hazards threatening the preservation of the heritage resources.
- Evaluation of the various urban development plans and zoning regulations that affect the integrity of the archaeological resources and historic and natural environments.

- Proposal of guidelines and amendments to urban master plans for the integration of heritage within socio-economic and tourism development plans.
- Drafting plans for the management of the archaeological and heritage resources of the city and its region.
- Providing support and professional advice to the DGA to ensure the most proper management of the archaeology, taking into consideration the limited resources of the official institutions in the country.

A list of the major efforts by UNESCO for the safeguard of the heritage of Tyre is presented in detail in the annexed "List of UNESCO efforts for the safeguard of Tyre". In this list, the main resolutions concerning Tyre are presented alongside the most important recommendations made by the Committee of the World Heritage Center. The nature and findings of the various UNESCO missions to Tyre are also included in the list. For this section of the report, a summary of the main views and recommendations of UNESCO (in partnership with the DGA) will be outlined thus defining the most appropriate plan of action for Tyre conservation. The proposed tourist marina project is an intrinsic part of the management plan of the city and, consequently, can only be discussed in the context of such a comprehensive plan.

The main recommendations for the conservation of the heritage of Tyre and its proper management are:

- The preparation of a management and revitalization plan for the city and its region in collaboration with the DGA and DGU.
- Protecting the Old City and the archaeological sites through the definition of non-aedificandi areas or buffer zones. The definition of special and sensitive building regulations and the prohibition of the construction of buildings with more than 3 storeys in the immediate proximity of monuments.
- The collection of all documentation pertaining to the history and archaeology of Tyre including reference to the previous state of the sites of Tyre; the creation of a Documentation Center for the city.
- The execution of a complete survey of the nature and extension of the heritage resources of Tyre including those that lie underwater.
- The conservation of the archaeological remains and the re-burial of those not intended for public presentation. Urgent measures must be taken in order to conserve fragile features like mosaics, *opus sectile* floors and frescos.
- Organizing visitor information and management.
- Staff development at the DGA in order to cope with the requirements of heritage conservation and management.
- The reconciliation of urban development and tourism with the preservation of heritage as a decisive factor.

2.3. The need for a comprehensive urban master plan for Tyre

The UNESCO World Heritage Center has often stressed the need for a comprehensive Urban Master Plan for Tyre and its region. The plan would organize building construction, preserve the natural and cultural heritage of the city and help develop tourism in a sustainable form. The idea of such a comprehensive master plan was developed in 1982, i.e., prior to the inclusion of Tyre on the World Heritage List. The first party to recommend it was UNESCO in the context of the mission to Tyre by Vasak, Poppeliers, Styrenius and Leblanc. They proposed a revitalization plan for the city of Tyre that would help protect the archaeological sites and halt the steady demolition of historic buildings in the Old City. The proposed plan would take into consideration the plan submitted by Pierre el-Khoury in 1964 as well as the one presented afterwards by Jalal Bitar. The idea remained a principal concern to UNESCO in collaboration with the Lebanese Authorities. Important recommendations centered around the creation of non-aedificandi zones around archaeological sites and the protection of potential archaeological zones in the Tyre area, like for example at tell el-Rachidiyye, tell al-Maashouk, the Necropolis of Tyre and at other important locations.

A new urban master plan for Tyre commissioned by the DGU and in preparation since 1997 (private company Modon in association with Constr.) has been lately presented to the DGA for evaluation. The plan is expected to present solutions to the issues of heritage protection, building control and tourism development. Following the evaluation of the plan by the DGA, a set of amendments was presented to the DGU. They can be summarized to the following:

- The designation of "Archaeological Areas" a number of parcels that were originally expropriated by the DGA.
- The designation of "Archaeological Areas" a number of parcels where important archaeological remains were discovered, like for example the Hellenistic temple and the early Christian basilica.
- The prohibition of below ground construction in a number of areas where archaeology is known to occur so as not to jeopardize the heritage potential of such areas.
- The reduction of the total exploitation factor on a number of areas linking the two archaeological sites together.
- The creation of a buffer zone around archaeological sites with an average width of 100 meters.
- The elimination from the proposed plan of the new harbor extension since no final scheme regarding the nature and form of this harbor has been presented yet.

According to UNESCO, the new urban plan is limited to a zoning system that does not fulfill the requirements of a comprehensive urban master plan with the task of safeguarding heritage while creating the necessary conditions for development. With respect to buffer zones around archaeological areas, these areas are not specifically designated, and consequently cannot be adequately controlled. Furthermore, the new plan does not attempt to introduce major

attractions into organized tourist circuits, nor does it guarantee the interaction of the archaeological heritage with the traditional and the urban environment as well as create new possibilities for employment.

UNESCO stresses furthermore that the Old City, its sea front and the fishing harbor are components of the same entity that should not be partitioned. Consequently, the ensemble requires a coherent approach that will guarantee the global protection of the site and its integrity, the conservation of its historic monuments, and the management of its tourist development.

It is hoped nevertheless that the urban management scheme under study by Pierre Khouri in the context of the World Bank Project "Heritage Conservation and Tourism Development in Lebanon" would treat the ensemble of the Old City and its harbor in a more detailed form identifying main historic buildings and other attractions, determining the needs of their conservation and presentation to the public, their inclusion into a tourist circuit and the development of a tourism industry focusing on the local Tyrian heritage.

2.4. Potential role of the harbor in the future development of the city

2.4.1. Significance of the harbor

The harbor of Tyre has always been central to the functioning and development of the Old City. Its urban history stretches back to the 3rd millennium BC. Fishing and commerce were the major occupations of the inhabitants back then. Until today, fishing is an important source of income for many families in Tyre; it is characteristic of a particular way of life and is considered one of the main potential tourist attractions in the city. Several harbor installations pertaining to various historic periods can be discerned on a number of old plans and engravings. Moreover, the survival of historic remains above and underwater gives an ample idea of the magnitude and extension of the harbor in past times. Based on the above, the rehabilitation and management of the harbor of Tyre and the creation of a Tourist Marina is a project that should be executed in the context of comprehensive efforts for the preservation of the heritage of the area and the development of cultural tourism. The same cultural resources the Tourist Marina attempts to draw upon must determine its shape, function and size, so as to maintain the balance between what needs to be protected and what needs to be made accessible for visitors' enjoyment.

2.4.2. Engendered benefits

Tourism and visitors engender a range of benefits at both the local level and the national levels. A marina in Tyre could among others extend the following benefits to the city:

- Make Tyre an important arrival place for both national and international visitors.
- Develop and boost tourism in the area. Contribute to market Tyre as an important tourist destination in the Mediterranean.
- Improve the current state of the harbor and enhance Tyre's image in general.
- Offer a different type of tourist product from Lebanon. A marina would allow the town to develop a multi-faced package (underwater archaeology, sea-related sports, sun & beach tourism, etc.)
- Generate additional sources of income.
- Help diversify the economy.
- Justify environmental protection and improvements; it could also make people aware of the importance of investing in old buildings, heritage conservation and interpretation of cultural resources.
- The marina will also engender a range of benefits for the Tyre local community like future work perspectives especially for its young generations (around 46% of Tyre's population is younger than 19 years old). Such part time job offers could be generated by restaurants or cafes, souvenir shops, guiding, boat rides.
- Fishermen could also improve their economic conditions by teaching fishing methods (fishing, sailing, winds, etc), story telling, etc.
- Indirectly, boost other tourism-related activities such as glass production, artisanat, etc.
- Improve and diversify education. Tourism is a chance to increase the percentage of school enrollment rate, as well as favor the creation of new educational activities and institutions (languages, tourist guide courses, historical background, etc.)
- Ensure the survival of traditional crafts and working methods.
- Revitalize the Tyrian ship building industry.
- Enhance the local community's sense of pride.

3. POTENTIAL IMPACT OF PROPOSED MARINA ON THE HARBOR AND SURROUNDING AREAS

3.1. Potential impact on the underwater archaeology and the harbor (Photos underwater archaeology photos, chose selection)

The underwater archaeology situated within the present harbor area of Tyre has always been a center of interest for archaeologists and historians. French archaeologist A. Poidebard was the first to dive in the harbor area for purposes of archaeological inquiry. He discovered underwater remains of ancient jetties and other installations. In 1960, British archaeologist Honor Frost conducted limited explorations in the area and reached similar conclusions as to the nature and importance of these remains.

In the context of the projected plan for the construction of a Tourist Marina, Dar Al Handasah Nazih Taleb and Partners Consulting Engineers financed the exploration of part of the harbor of Tyre, as a preliminary measure for assessing the potential impact such a plan can have on the underwater heritage.

The main findings of the Lebanese Team can be summarized to the following (see plan provided by the underwater survey report):

- The discovery of two large masonry walls (measuring each ca. 95 and 85ms with masonry blocks of 2.25 x 0.45 x 0.55ms) running east-west, parallel to each other and to the modern jetty, and situated at a distance of 8ms from each other. The walls are possibly the remains of an ancient jetty connected to the northeastern tip of the island and used in classical and medieval times.
- A 13ms long wall of similar width and height running north-south and connecting the two parallel walls from their eastern extremities, thus closing the space between them from that edge.
- Two walls running north-south with respective dimensions of 25 x 9ms and 13 x 4ms (masonry blocks are of different shapes and sizes with the largest block amounting to 1.90 x 0.45 x 0.55ms).
- A number of columns and masonry blocks scattered alongside the alignment of the modern jetty and to the east of it as well.
- A number of underwater deposits of large size that could cover archaeological features like shipwrecks, constructions, etc.
- Scattered deposits of ceramics and other artifacts.

From the preliminary findings of the diving team, it is obvious that the underwater area of the harbor is packed with archaeological features and objects. This is of course not an unusual phenomenon at Tyre as the harbor is historically attested since at least the Iron Age period (i.e., from the 1st millennium BC). Subsequent harbor installations for protection, extension and defense, stretching from the classical to the medieval period are to be expected. Moreover the richness of the area in historic shipwrecks, themselves an important heritage resource, is already evident from the existence of heaps of stone, sand and archaeological material (possibly pertaining to ships sunk on purpose in order to block the entrance to the harbor in times of war), as well as archaeological features like piers and jetties, ancient artifacts like pottery of different periods, indicating the long use of the harbor throughout history and the valuable historical information available underwater. Such resources can play a decisive role in the development of a cultural tourism infrastructure at Tyre revolving around the history and mythology of the Phoenicians, Alexander the Great, the Romans, the Crusaders and the Arabs, as well as around the topography and extension of the city underwater.

The limited survey, restricted to the area directly to the north of the modern jetty and to the entrance of the harbor from the east side proves that a substantial amount of buried features remains to be discovered underwater. The regular accidental discovery of artifacts during cleaning operations inside the harbor shows that much more is to be expected in that particular area of the harbor.

The impact of the projected tourist marina on the underwater archaeology can be detrimental and damaging if it involves the installation or construction of new permanent features, like piers, jetties, platforms and other facilities in the harbor area. Judging from the preliminary underwater survey at Tyre harbor, the value and significance of the archaeological resources is overwhelming because of the rarity, level of preservation and easy accessibility (shallow depth) and visibility of these archaeological features. Their tourist potential is, needless to say, enormous and can contribute largely to the development of the tourist industry in Tyre and the creation of additional employment for its inhabitants.

3.1.1. Options

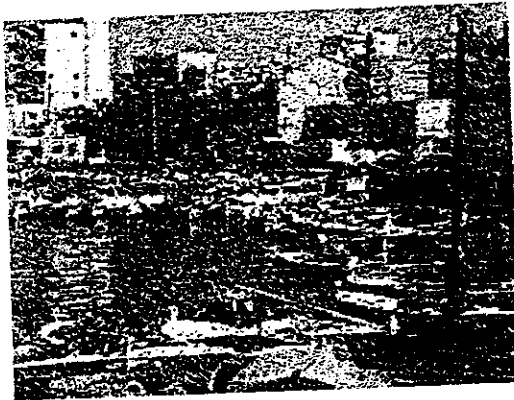
In case a balance is to be established between the preservation of the archaeological resources underwater and the construction of a tourist marina in the harbor area, the available options that can guarantee the less possible damage to the underwater resources are:

- Conducting works in areas which are free from underwater archaeological remains. This can be assessed by executing a localized underwater survey of the area where construction is to take place. If the archaeological potential of such an area is inexistent, construction might take place in the context of an environmentally sympathetic design that respects the historic and natural setting of the area. Special budgets must be allocated to such underwater surveys. They are expensive and time consuming and might jeopardize the financial viability and timetable of the engineering project. They are nevertheless necessary in order to map, once and for all, the location and importance of the underwater heritage. The evaluation of the results of the surveys must rest with the DGA. The priority of the DGA so far is to safeguard the threatened heritage resources of the area without really creating a new situation where intervention will be necessary and pressure drawn on DGA's staff and infrastructure. Consequently, the decision to go ahead with this option must be carefully taken and a preliminary dialogue with the parties involved must precede the final definition of a strategy.
- Conducting works in areas that have already been damaged by previous non-sympathetic construction. Some areas of the harbor are left unused and are quite shanty and run-down creating a serious encroachment in the area. The rehabilitation of these areas and their conversion into tourist docking areas and facilities can prove to be a successful operation on the level of urban improvements in that area.
- Constructing the harbor outside the area of the historic harbor of Tyre, in a place where underwater archaeology is not known to exist, like for example in the area of Mhailib.

3.2. Potential impact on the maritime façade

The maritime façade of Tyre is composed of late 19th to early 20th century public, commercial and residential buildings mixed with modern concrete commercial constructions. The old fabric is of fine quality and of historic

importance since it illustrates the harbor construction boom of the late 19th early 20th century. It was associated with a vivid maritime trade, in fact, most historic cities on the Lebanese coast have had their sea fronts reformed around that time and their harbors endowed with a number of khans for merchants, and administrative buildings for the management of the ports. A substantial part of the historic quay can still be seen in the western portion of the harbor. It was preserved in its entirety until the modern development of the harbor covered large parts of it with concrete platforms. The historic importance and architectural value of the old buildings on the seafront is however diminished by the haphazard constructions of commercial stores and high apartment blocks in the area. Currently, combined efforts by the DGA and the Tyre Municipality for the rehabilitation of the facades of the historic buildings is already having a positive effect on the overall aspect of the seafront. The treatment of the square in front of these buildings and the facades and arrangement of the modern concrete buildings requires serious rehabilitation in order to improve the overall character of the area. It is hoped that the World Bank Project for the regeneration of Tyre in the context of cultural tourism development will address this issue seriously.



The rehabilitation of the existing harbor in order to create a tourist marina, if not carried out within the historical context, will have direct repercussions on the character of the maritime façade of the city. The proposed marina could put more pressure on space in that area which is already strangled by traffic flow, the facilities of the commercial harbor and car parking. The entire seafront facing the harbor was in the past open to the sea, nowadays; concrete and steel constructions as well as enclosures from the commercial harbor side block the view of the port from within, and conceal the beauty of the sandstone buildings from without.

If improperly managed, the tourist marina can aggravate the situation and create more congestion in that special area of the city.

3.2.1. Options

In order to avoid the depreciation of the maritime seafront, the tourist marina should help improve the situation of the maritime façade by removing visual obstacles and providing public access to some of the piers in the context of a

visitors' promenade. Tourist boats that dock in the tourist marina can improve the visual aspect of the seafront; they must consequently be clearly seen and be easily accessed from the main street.

3.3. Potential impact on the Old City

The Old City of Tyre is a self-contained and dynamic entity with a traditional and authentic character. The harbor of the city is an intrinsic part of the historic assemblage; consequently, any alteration to the shape and size of the harbor of Tyre can affect the Old City directly and damage its authentic and historic character. The size and location of the tourist marina will be decisive with respect to the conservation of the Old City and its tourist management. Moreover, the flow of tourists onto the Old City can affect the sustainability of the heritage resources of that area if not kept to a safe minimum.



3.3.1. Options

In order to avert possible negative impacts of the tourist marina construction on the Old City as a whole, the following criteria must be respected:

- The marina construction should respect and help preserve the archaeological resources in that area.
- The marina construction should respect the historic character of the city in the design of its size, location, shape and landscaping.
- The tourist marina should not create pressure on the infrastructure of the Old City and its serene and peaceful character. The inhabitants of the old quarters are in constant contact with the harbor; they spend a substantial part of their leisure time on that side of the city. The Marina should not restrict the available space nor increase the pollution of the harbor.

3.4. Potential damage to the nomination of World Heritage Site

With respect to tourism infrastructure and development, UNESCO recommends that sites and monuments be inserted into an organized tourist circuit of large visibility. Moreover, the interaction between the archaeological heritage, the traditional heritage, the arts and crafts, the traditional life style, the urban and natural environment and the promotion of employment, must be enhanced. UNESCO has expressed concern about the scale of the new tourist harbor construction at Tyre and has specifically iterated that damage to the underwater and natural heritage of the harbor might deal a direct blow to the criteria of the World Heritage Site nomination. Consequently, the construction of the tourist marina in the harbor area of Tyre must be specifically considerate to these resources.

3.4.1. Options

Lebanon is seriously committed to fulfilling the conditions and criteria of the World Heritage Convention that was ratified by the Lebanese authorities in the early eighties. The international recognition of the universal value of the Lebanese heritage is not only a proud statement of national identity, but also a process with positive repercussions on the development of cultural connections between nations and the promotion of the Lebanese heritage both culturally and touristically. Consequently, and as stated earlier in the report, the creation of a tourist marina aims at making available to a particular class of visitors the cultural resources of Tyre in addition to trying to revitalize the local economy of the region. As a result, the marina should not endanger the same resources it pretends to manage and exploit. The construction of the marina should respect the following criteria:

- Maintain a reduced size so as not to damage the scale of the Old City and increase pollution in the harbor.
- Determine the number of vessels to host in the harbor in the framework of an overall sustainable approach to the conservation of the cultural and natural resources of Tyre. The potential construction of a tourist marina at Sidon, Beirut, Jbeil and other coastal cities will ensure a fair distribution of visitors and will conserve the peaceful character of the Old City.
- Avoid damaging the natural and archaeological resources of the ancient harbor of Tyre because this will contradict with the reason for the creation of the tourist marina and because it will damage the designation of World Heritage Site.

3.5. Socio-cultural impact

The harbor area of Tyre is a dynamic and self-contained space where social activity is rich and varied. In this area, social bonds and human relations are created and renewed through traditional and leisure activities of fishermen and inhabitants.



The inhabitants of the old quarters go on daily walks to the harbor area. The fishermen maintain a constant presence there; when they are not involved in fishing activity, they indulge in traditional social practices like story telling, gatherings in cafés, card games, etc. Moreover, they conduct the traditional craft of net spreading and fixing, boat cleaning and repair on a daily basis and under the wondering eyes of visitors and tourists. This social interaction between fishermen, visitors, and local inhabitants is an important facet of daily life at Tyre. It forms part of the traditional heritage of the city in need of preservation. The construction of a tourist marina in the harbor zone of Tyre can upset the social balance of the area if it does not respect its rules and avoid encroaching on its space.

3.5.1. Options

The socio-cultural activity inherent to the dynamism of the harbor is an important characteristic of daily life at Tyre and a valuable aspect of the traditional heritage of the city. The proposed marina construction can disturb or damage the social balance maintained at the harbor side if it encroaches on the domain of the fishermen and if it creates a new demand on space at the level of the seafront and the Old City promenade. Consequently, the marina construction should avoid the following:

- Avoid encroaching on the fishermen's harbor because it is already crowded and polluted. The fishermen should not have their own space in the harbor reduced nor should they be forced to adapt to physical constraints brought about by the insertion of the tourist marina. Consequently, the tourist marina should be located more towards the commercial harbor rather than close to the fishermen's harbor in need of rehabilitation.

- The marina should avoid reclaiming areas restricted to its use from the maritime front. Access to the marina piers by the local inhabitants should be made available with a certain level of control.
- Cultural interaction between visitors and local inhabitants should be encouraged and should take place in gardens, open spaces and restaurants and cafés.
- The number of new vessels the marina could host at one time should be kept to a reasonable minimum 20-30 max. Small to medium size boats so as not to create pressure on the cultural resources of the area, reduce pollution and maintain the serene and peaceful character of the Old City.

3.6. Impact on the area of Mhailib

Another optional location for the construction of the Tourist Marina is the area of Mhailib located at approximately 4kms to the north of Tyre. At the proposed location (see map), underwater archaeology appears to be absent judging from the results of the archaeological survey conducted there by the Lebanese team. Archaeology was found one kilometer towards the south directly on the seashore and consists of fragments or complete sarcophagi of the Roman period engaged in the sands of the shore.

These sarcophagi could have been located in the area just opposite the shore in antiquity but has since then been slowly reclaimed by the sea. They could have also been deposited in caves situated within a limestone reef which has disappeared underwater. In any event, the sarcophagi, which form part of a necropolis, can either be preserved in situ (which is actually a very attractive feature with a significant tourist potential) or be removed away from the sea in order to preserve them in a cultural tourism management scheme. One important point has to be clarified here, the presence of a Roman necropolis in that area of the seashore indicates without doubt the presence of an antique settlement in the vicinity. Consequently, the location and importance of this settlement must first be determined in the context of a detailed survey of the area so as to be able to assess the possible impact the marina can have on these archaeological resources and on their possible incorporation into a regional tourist circuit. This process can be agreed upon with the DGA and the adequate measures to be taken in this respect.

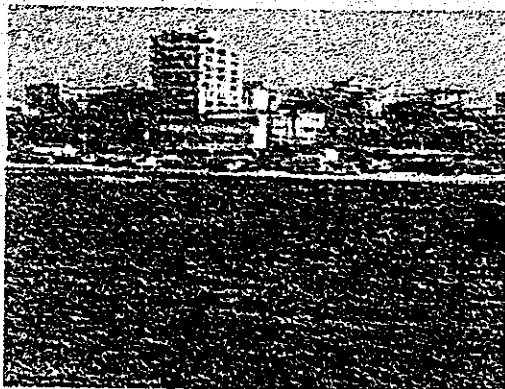
From the point of view of heritage management and tourism development, Mhailib might not qualify as a location that provides direct access to the cultural offer, like in the case of the harbor of Tyre. In fact, the core historic and cultural area is not accessible except after a short motorized transfer to Tyre; moreover, there are no tourist facilities like restaurants, cafes, or pubs available in the immediate vicinity, and ultimately, tourist interaction with the local cultural offer is being significantly reduced. Another possible risk resides in the development of potential tourist businesses which could be lured to the adjacent area of Mhailib as a result of the construction of the marina. This might lead to the destruction of the natural and aesthetic character of the locality. Finally, the engendered benefits of the marina on the process of heritage conservation, the upgrade of the physical urban environment and the improvement of the economy can be significantly reduced if the marina was to be located away from the city of Tyre.

4. PROPOSALS FOR A SUSTAINABLE LAND USE SCHEME FOR TYRE HARBOR

4.1. Improvements to the harbor of Tyre

The decision to construct a tourist marina in the harbor area of Tyre can, if managed properly, bring about a number of improvements to the conditions and physical infrastructure of the port. Such improvements should revolve around a number of basic needs that will upgrade the quality of the harbor and make it more sympathetic to the cultural value of the city. The improvements proposed are:

- Cleanup and upgrading of fishermen's harbor.
- Rehabilitation and organization of fishermen's harbor.
- Creation of special areas dedicated to fishermen activity like net-spreading, net maintenance, storage of equipment, etc. Such areas should be accessible to interested visitors who would like to learn about the fishing trade.



- The creation of such tourist activities will indirectly prompt property owners in the area to repair their buildings and accommodate tourist facilities like restaurants and cafes on the seafront. The space needed for the proposed tourist activities can be found in the area adjacent to the port and can take place in the context of a landscaped garden with a museum, a visitor's center, and other facilities. The space allocated to the garden adjacent to the harbor is significantly large, if not managed properly it could end up as a derelict place. Consequently, its management is linked to the dynamism of the harbor and the Old City, this space can host an array of activities that will guarantee its extended use and preservation.

4.3. Management of the project and integration with UNESCO's campaign for the safeguard of Tyre

UNESCO has laid constant stress on the comprehensive approach for the conservation and management of the World Heritage Site of Tyre. But proposals for future action in the framework of a comprehensive master plan for the sustainable development of the city is seen as a joint task to be undertaken by the various local partners involved. The project for the construction of a tourist marina at Tyre must first respect current efforts for the preservation and management of the cultural heritage of the city and then determine a future plan of action that will highlight the objectives for the management of the harbor and the maritime water front. Such objectives have been discussed in length throughout the report. The tourist marina project can be easily integrated into the current World Bank design project as well as the UNESCO management plans if it supports the following criteria:

- The need to preserve and protect the underwater resources of Tyre as well as make them accessible to people's enjoyment in the context of a sustainable tourist plan.
- The need to upgrade the harbor environment so that it respects the cultural importance of the city.
- The need to draft special regulations to organize the development of the harbor area.
- Provide the finance necessary to constantly maintain and enhance the harbor area.

5. CONCLUSIONS AND RECOMMENDATIONS

The current study strived to assess the possible impact of the tourist marina construction on the cultural heritage of Tyre. Two areas were chosen as possible locations for the proposed marina: the harbor area of Tyre and the area of Mhailib. From the findings of the various underwater surveys, the following conclusions were reached:

- At Tyre harbor area, the underwater archaeology is rich and of great cultural and tourism potential, consequently it requires better understanding and preservation. The construction of a tourist marina in the harbor of Tyre could damage these resources unless undertaken in a favorable location i.e. the area of the actual commercial harbor where damage is already done and after the conclusion of a detailed survey of the sea bottom.
- At Mhailib, no underwater archaeology was identified, but the future development of seashore constructions associated with the marina can damage the possible on-land archaeology. For that reason a land survey must be undertaken to determine the location and importance of the historic settlement (in fact, the threat will not be from the harbor, but from tourist development in that area in case a marina was built).

From the perspective of conservation and heritage preservation, the consultant proposes the construction of the tourist marina in the harbor area of Tyre after the following prerequisites are fulfilled:

- Undertaking a full underwater survey of the sea-bottom inside the harbor in the specific area chosen to be rehabilitated and transformed and eventually in the area outside the harbor. If underwater archaeology is encountered, permanent constructions that could damage the heritage resources must be avoided.
- Limiting the number of boats docking in the tourist marina to a maximum of 30, based on the requirements of sustainability of the environment and the cultural resources of Tyre.
- Using the marina project as an opportunity to upgrade the fishermen port with the creation of amenities for fishermen and locations for the interpretation and presentation of the underwater heritage of Tyre in the context of an interactive educational museum and open air facilities.
- Providing the necessary space for the conservation and revival of shipbuilding at Tyre, which is considered a valuable cultural and tourist asset.

The consultant based his choice on the harbor of Tyre for the most adequate location for the tourist marina on the following criteria:

- The need to conserve the natural beauty of the coast of Mhailib after the loss of part of the Tyrian northern sandbeaches through the construction of the cornish.
- The need to protect the archaeological resources of Mhailib located on land.
- The need to rehabilitate the current state of the harbor of Tyre and stop polluting activities.
- The need to develop cultural tourism at Tyre in order to generate the finance necessary for conserving the heritage resources of the city and extending benefits to the local population through tourism development.

6. ANNEX 1 : SUMMARY OF MAIN EFFORTS BY UNESCO FOR THE SAFEGUARD OF TYRE

Summary of main efforts by UNESCO for the Safeguard of Tyre

Date	Party	Actions	Observations/Recommendations
10 June 1982	Director General of UNESCO	Director general calls for the safeguard and protection of the city of Tyre and its region.	
Autumn 1982	UNESCO mission to Tyre (Vasak, Poppeliers, Styrenius, Leblanc)	The results of this mission contributed to the inclusion of Tyre on the World Heritage List in 1984.	Degradation of archaeological sites in the interval of 15 years and disappearance of numerous buildings of the Old City. Recommendations: <ul style="list-style-type: none"> - A new photogrammetric survey be undertaken for the Hippodrome, the Roman Road, the Palestra and the Old City in order to compare the state of the sites in 1982 with their state in 1973. - Preparation of a management and revitalization plan for the Old City taking into account the urban scheme of 1973.
1982	Team of experts recommended by the French companies Serete and Fougerolle at the request of the Municipality of Tyre in relation with the CIST.	The team established a program for the rehabilitation of the city.	The program reviewed the following studies: <ul style="list-style-type: none"> - Plan de sauvegarde d'urgence de la ville de Tyr, Reconstruction et Aménagement de la ville de Tyr (prepared by Jalal Bitar). - Plan directeur de la ville de Tyr du 25 juin 1964 au 1/5000 (Pierre el-Khoury).
1982	Patricia Bikai	Proposals for a work plan for the preservation of the archaeological zones of Tyre	
1982	FAO mission to Tyre (Axel Baille and Philippe Robert)		Recommendations for the rehabilitation of the harbor of Tyre.
29 November 1983	Lebanese Government	Lebanon proposes to UNESCO the inscription of Tyre on the World Heritage List.	

Date	Party	Actions	Observations/Recommendations
2 December 1983	UNESCO	Tyre included as cultural asset no. 299 on the UNESCO World Heritage List.	<p>Recommendations for the management of Tyre:</p> <ul style="list-style-type: none"> - Extending the excavations inside the Old City in order to locate the ancient temples and most particularly the Temple of the Phoenician god Melquart. - Uncovering the remaining portions of the Roman-Byzantine Road leading towards the Old City including the various parts of the necropolis located in the al-Bass area.
1983-1984	UNESCO mission to Tyre (M.R. Hachmann and Ernest Will assisted by Ibrahim Kaoukabani on behalf of the DGA)	Mission for the protection of the monuments and archaeological sites of Tyre and their presentation to the public.	<p>Recommendations:</p> <ul style="list-style-type: none"> - The need to protect the Old City which is delimited by its medieval fortifications, as well as the major archaeological sites through the definition of <i>non aedificandi</i> zones as buffer areas against the extension of the modern settlement. - The definition of building regulations for the areas located beyond the archaeological sites, like for example the sand dunes area, and which are littered with structures of all kinds.

Date	Party	Actions	Observations/Recommendations
16-17 January 1984	Work Group of the International Campaign for the Protection of Tyre, UNESCO	1 st meeting of the work group. preparation of recommendations for the Secretariat of UNESCO in charge of preparing a Plan of Action for the International Campaign in agreement with the Lebanese Government.	<p>Recommendations:</p> <ul style="list-style-type: none"> - The preparation of a regional development plan which ensures the preservation and protection of the cultural assets in the Tyre region including the Old City, the archaeological site situated on the island, the area of the ancient necropolis, the Hippodrome, the ancient city, the northern and southern harbors as well as the archaeological areas situated within the Palestinian refugees camp. - The proposed Master Plan must rely on the characteristics of Tyre and its region, the analysis of the socio-economic data, the infrastructure, zoning regulations, traffic management, an evaluation of needs of lodging, the restructuring and management of development, in order to reach the suitable propositions for the rehabilitation and safeguard of the city. - The implementation of the master plan will require a management body (referred to as "technical unit") resident in Tyre and responsible for a number of associated tasks related to the proper implementation of the Master Plan. - Freezing archaeological excavations until a resident archaeological team can be formed.

Date	Party	Actions	Observations/Recommendations
			<p>The work plan as drafted by the Secretariat of UNESCO established the following priorities:</p> <ul style="list-style-type: none"> - The study of the heritage of Tyre must be undertaken while establishing an inventory of cultural assets for the city and its region under the supervision of the DGA and in collaboration with the DGU and the Tyre Municipality. - The gathered information pertaining to the state of conservation of the sites and monuments must determine the restoration works needed in each case including the break-down of costs. A multi-disciplinary team consisting of 2 archaeologists, 1 architect, 2 draftsmen, 1 topographer and 1 engineer must be formed for this purpose.
21-28 November 1984	Mission lead by Pierre Bikai and Michel Cauchon in collaboration with the DGA. Nahla Farran, architect commissioned by the DGU.	The mission aims at defining a methodology to be applied in the context of a preliminary inventory of cultural assets to be preserved at Tyre.	Four plans show the results of the archaeological and historic inventory for Tyre. One plan (1/2000) depicts the Old City with 25 selected buildings that merit preservation. Nahla Farran, prepared the briefs for the selected buildings with surveys and photos.
May 1984	ICOMOS	Evaluation of the application for the inclusion of Tyre to the World Heritage List of Endangered Sites.	<p>Recommendations:</p> <ul style="list-style-type: none"> - The inclusion of Tyre on the condition that the Lebanese Government agrees to undertake protection measures consisting of: creating protection zones (buffer zones) around the sites, defining <i>non-aedificandi</i> areas on larger surfaces, prohibiting the construction of buildings with more than 3 storeys in the immediate proximity of the monuments.
4-7 June 1984	World Heritage Committee, UNESCO.	Recommendation of the conditional inclusion of Tyre to the World Heritage List.	The condition for inclusion was the creation of protection zones around the two archaeological sites.
29-2 November 1984	World Heritage Committee, UNESCO.	Decision to include Tyre to the World Heritage List.	Further clarification was required of the future measures to be taken by Lebanon for the protection of the archaeological areas of Tyre limited by Sarafand (north), Rass al-Ain (south), the hills overlooking Tyre (east) and the sea (west).

Date	Party	Actions	Observations/Recommendations
September 1985	Convention for the Protection of the Mediterranean Sea from Pollution (Barcelona Convention)	One of 10 main objectives: identification and protection of at least 100 historic sites of common interest along the Mediterranean coast.	ICOMOS was asked to propose a list of sites conform to the criteria of selection. Tyre was selected.
28 February 1986	Work Group of the International Campaign for the Safeguard of Tyre		Note taken of new alterations to the archaeological sites.
10 February 1987	Work Group of the International Campaign for the Safeguard of Tyre	Creation of a new program of priority actions on the national and international levels.	<ul style="list-style-type: none"> - Protection of archaeological and historic heritage of Tyre. - Creation of an urban master plan for the city and its region in collaboration with DGA and DGU. The first phase would consist of an emergency zoning system for the city and its immediate area as well as preliminary building regulations. The second phase would start in 1989 and include a complete building regulations' code with a land occupation law. The expropriation of lands for the extension of the archaeological sites was also deemed necessary.
5 June 1987	Executive Council of UNESCO	Project presented for the organization of the International Campaign for the Safeguard of Tyre.	Director General of UNESCO was invited by the Lebanese Authorities to launch an "alerte patrimoine" for the inform international and local opinion about dangers that threaten the cultural heritage of Tyre.
19-21 January 1989	Responsible for the sites of common interest for the Mediterranean	Adoption of Document on "Orientations pour la connaissance, la sauvegarde, la planification et la gestion des sites historique".	
July 1993	Erdal Ozhan, consultant to UNESCO	Report on the condition of the Tyrian coast.	The report commented on the negative effects of sand extraction in the proximity of the archaeological site.
2-3 May 1995	UNDP-UNESCO Project, Gian Carlo Barbato.	Report on Historic Centres of Tripoli, Deir al-Qamar, Beit al-Din, Tyre and Sidon	Barbato draws the attention to the risks inherent to the implementation of the urban zoning system of 1991 since it still allows the construction of high density buildings on the fringes of the Hippodrome as well as at the southern coast of the city.

Date	Party	Actions	Observations/Recommendations
September 1995	Director of World Heritage Center, UNESCO.	The land reclamation project for the extension of the northern harbor of Tyre and the construction of a tourist complex.	The director of the World Heritage Center warns that such a project will destroy the underwater archaeological heritage in that area. The World Heritage Committee warned that if such an operation is undertaken it could direct a major blow to the environment of the World Heritage Site.
March 1996	Mission by UNESCO consultants Fonquernie and Bizri.	Assessment of the urban plan of 1991 for the development of Tyre.	<p>Findings:</p> <ul style="list-style-type: none"> - Inadequacy of the 1991 urban plan, which does not respect the cultural value of Tyre. - Damage to the agricultural and coastal areas by the construction of buildings along existing routes. Absence of any impact study on the environment. <p>Recommendations:</p> <p>The report proposed guidelines for the development of a new urban master plan for Tyre and its region which takes into consideration the cultural resources of Tyre, the protection of the natural environment, the development of tourism in the context of a comprehensive regional plan for the development of the area.</p>
23-27 June 1997	World Heritage Committee, UNESCO	Discussion of the proposed project for the construction of the tourist harbor.	
May and August 1997	Stanley-Price, consultant to UNESCO	<p>Preparation of two reports:</p> <ol style="list-style-type: none"> 1) Management plan for the archaeological site of Tyre 2) Priority actions for the immediate protection of the site of Tyre 	<p>Recommendations:</p> <ul style="list-style-type: none"> - Mechanisms for the creation of the Documentation Center for Tyre. - Guidelines for conservation and restoration - Scientific research - Visitor information and management - Staff development - Infrastructure development - Implementation - Review and monitoring. <p>In his second report Stanley-Price presented suggestions for priority actions with proposals and budgets, project schedule, as well as specific projects for potential donors.</p>

Date	Party	Actions	Observations/Recommendations
3 March 1998	Frederico Mayor, Director General of UNESCO	Official launching of the International Campaign for the Safeguard of Tyre.	
22-27 June 1998	World Heritage Committee, UNESCO	Concern regarding the new urban master plan for Tyre.	The Committee strongly advised the Lebanese Authorities to stop all development works that could endanger the heritage of Tyre and to improve the mechanisms of control over the heritage area.
21-26 July 1998	Daniel Drocourt, consultant to UNESCO	Study of the new Master Plan for Tyre.	<p>Recommendations:</p> <ul style="list-style-type: none"> - A comprehensive survey of the historic buildings in the Old City is required in order to determine the most adequate procedure for their rehabilitation and restoration. - The delimitation of the historic limits of the Old City and the designation of <i>non-aedificandi</i> zones on the emplacement of the Medieval-Ottoman city walls. - The re-evaluation of the archaeological zones since the proposed urban master plan managed to drop a substantial area of high archaeological potential (designated A1-A3 by the 1991 urban plan) depicted by the discovery of the early-Christian basilica discovered in that area. - The underwater reconnaissance of the area adjacent to the Tyrian coast. - Underwater reconnaissance of the northern harbor of Tyre.
9 February 2001	Director of World Heritage Center	Remarks regarding the proposed urban master plan for Tyre	Reservations with respect to the nature of the urban plan, the building regulations' code and the exact limits of the proposed buffer zones.

7. **ANNEX 2 : ARCHEOLOGICAL EXPLORATION FOR TWO SITES -
TYRE PORT AND RAS CHAOURANE / MHEILIB**

The archeological exploration was carried out for two different sites :

- 1- Within the area of the actual Tyre port
- 2- At Ras Chaourane/Mheilib around 5 Km north of Tyre

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Republic of Lebanon
Office of the Minister of State for Administrative Reform
Center for Public Sector Projects and Studies
(C.P.S.P.S.)

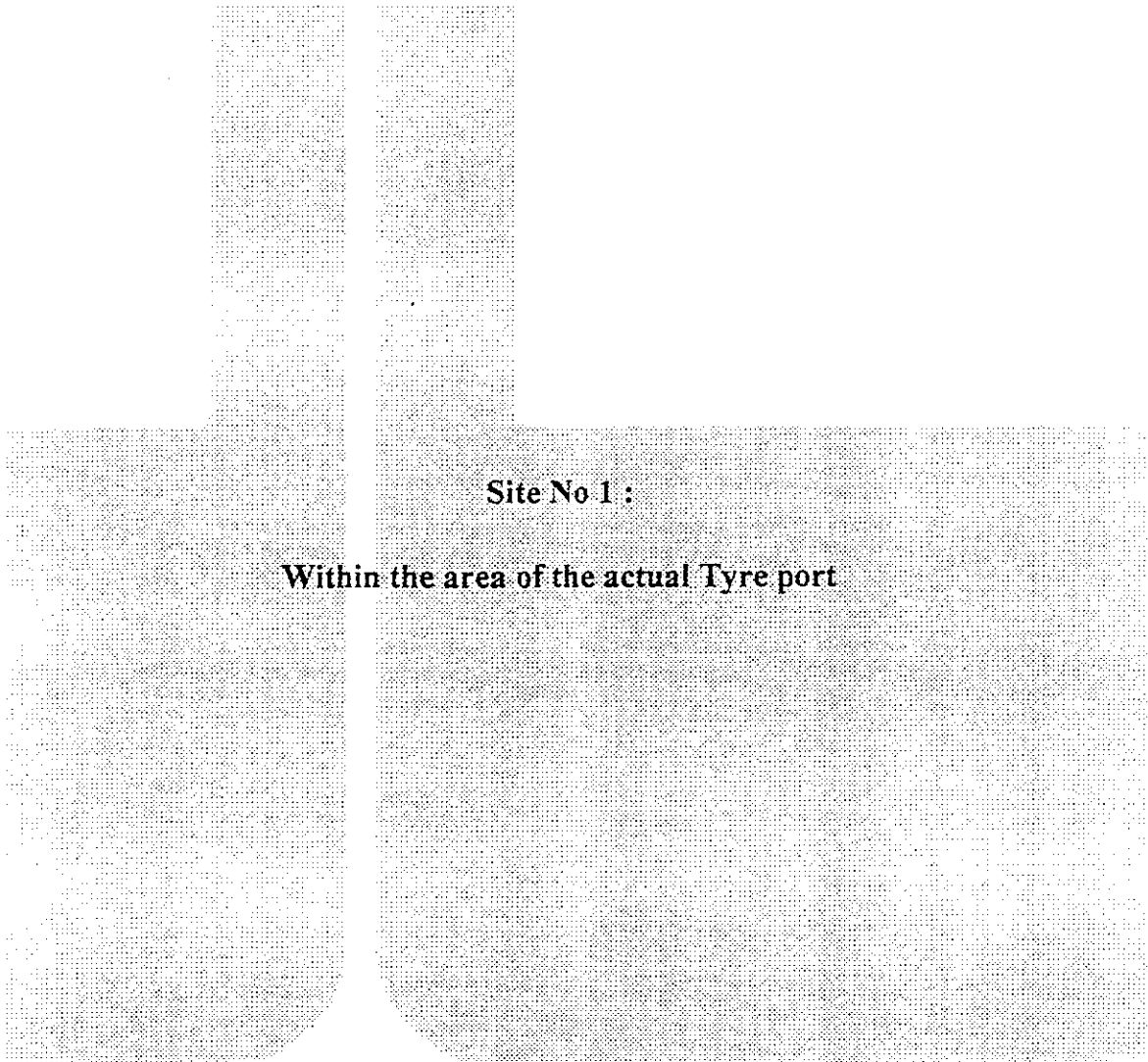


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Beirut, March 2001

Underwater Survey in Tyre

Preliminary Report of the Survey Mission By Tyre's Northern Harbor

By

Ibrahim Noureddine and Michel Helou.

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& The Authors

INTRODUCTION

In the process of a feasibility study conducted by Dar Al Handasah Nazih Taleb and Partners, concerning the rehabilitation of the northern harbor of Tyre, an archaeological underwater assessment was needed.

Our team of two Lebanese archaeologist divers was asked by Dar Al Handasah Nazih Taleb and Partners, and approved by the DGA, to conduct a preliminary survey to assess the archaeological potential in the northern side of the actual jetty, in addition to an extension zone extending towards the eastern end of the jetty.

According to previous explorations done by pioneer archaeologists such as A. Poidebard, (1934-1936) and Honor Frost (1960's), this area was described as of high archaeological potential.

Still, in the context of the present project we had to make sure of the described submerged features and to spot on the other hand, the changes accrued during the last four decades when the last survey was conducted. Eventually, we could spot new features cleared out by currents since the last survey, not to mention the development of scuba diving gear that had major effect in the fieldwork.

After conducting preliminary dives, we noted that the area beneath the water holds enormous amount of man made features such as walls, well cut blocks, columns, and a variety of pottery, in addition to large sandy areas that cover more ancient features. Assuring the previous information by the archaeologists mentioned above.

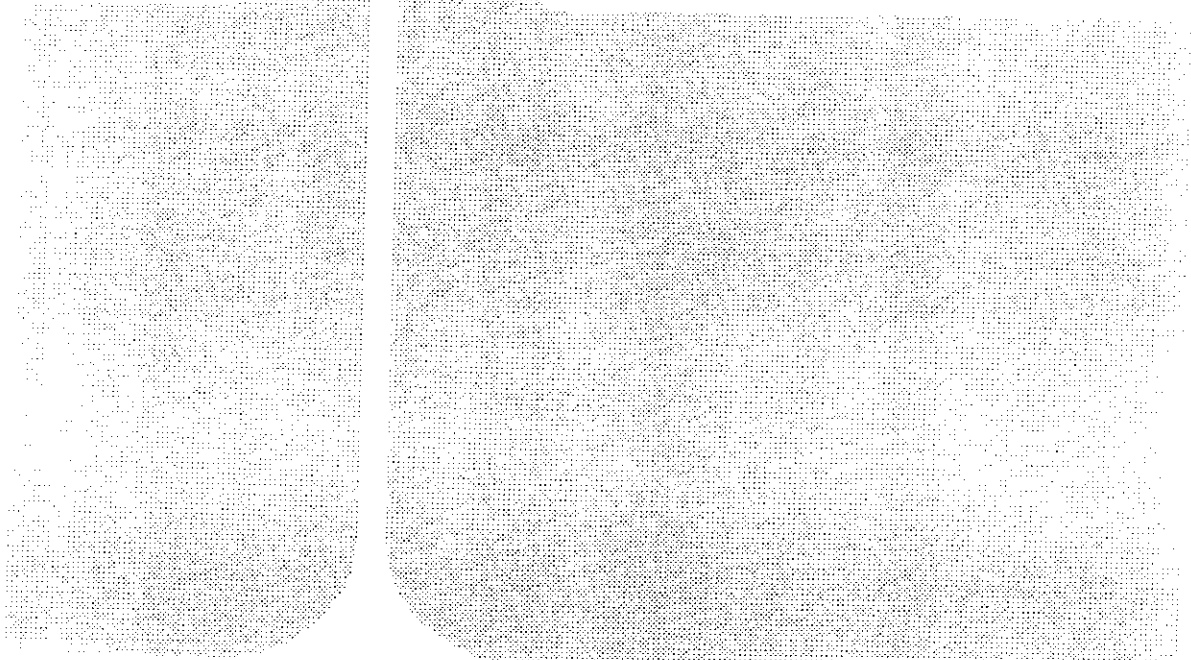
NOTE: The present report is preliminary and ought to be followed by a detailed one in the near future with complete analysis of the discovered features. In addition to which an Impact Archaeological Assessment is to be incorporated in the Final documents.

FIELDWORK

Introduction

From March 4th to March 31st, 2001, our team of two Lebanese archaeologist divers conducted, in coordination with the DGA and with the funds of DAR AL HANDASAH, a survey in the northern port of Tyre. The surveyed area is about 340 X 60 meters next to the northern side of the actual jetty; in addition to a narrow extension area (25m wide X 100m long) extending from the jetty towards the east. The fieldwork took 13 working days. Two dives were conducted daily by the team, each being preceded and followed by extensive snorkeling. (See logging)

The aim of the survey of the outer side of the jetty was to locate archaeological features in order to document them later on.



The Survey Method

The nature of the area is shallow and flat. Therefore, two basic methods were used. First, we snorkeled on the water surface (shallow water) using a rope between us (length depends on the visibility).

Second, we scuba dived (in deeper water) using the "parallel search system" by swimming on fixed compass headline for a given distance (Plate I). The distance is maintained by counting kick cycles or time. At the end of the swim line we turned 90° to the line of search, swim a short distance (depending on the visibility) and then turned 90° to parallel the previous line. This procedure is repeated many times, allowing a fairly large area to be covered quickly. (fig 1)

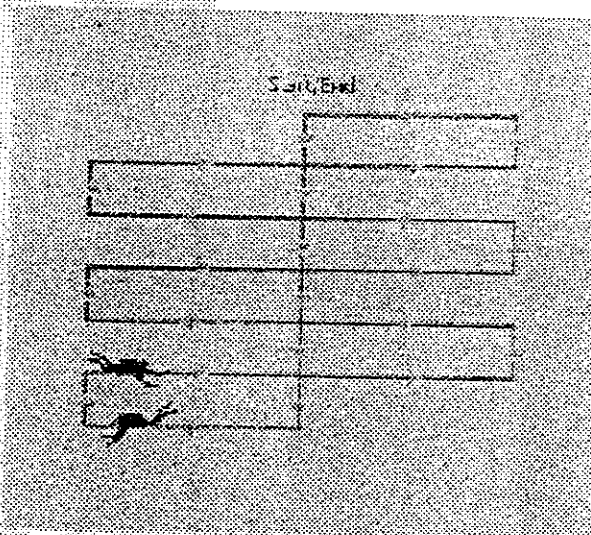
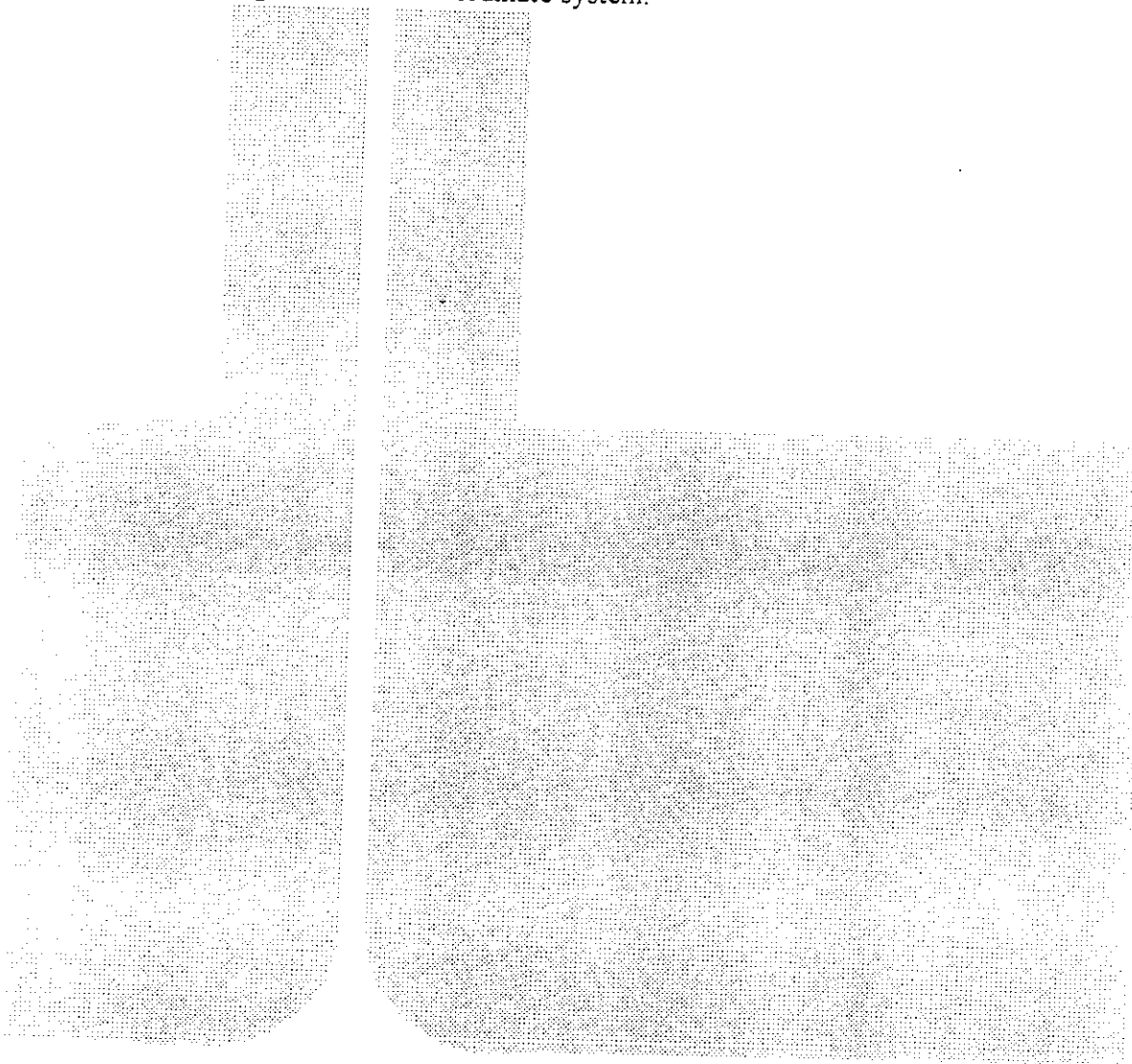


Fig. 1. Illustration of The parallel Search System

The whole area was divided according to a grid system, into 8 "so called" squares varying approximately between 40x60m to 60x60m each, in addition to the extension area 25x100m.

The squares were defined by fixed points that were put on the jetty, itself as x (east-west) reference, and that can be seen from the water (Plate I). The north-south perpendicular line stretching out from the jetty to the north toward an ancient tower called "Al-Mubarkeh" was the "y" reference.

Consequently, each square was limited by the intersection of two lines. One being the line parallel to the jetty starting from "Al-Mubarkeh" on the west, and the other line being the perpendicular line stretching from a point on the jetty into the water. Each square was surveyed individually, and all measurements within the squares were done according to the same coordinate system.



FINDS

Wall I

A wall oriented E/W 95m long, coming from square A in the extreme west through square B and ends in square C. the wall is formed by one row of big blocks about 2.25m Long, 0.45m large and 0.55m high. The blocks are all built with header shape "stone laid across". The wall has at least 3 courses that can be seen. (Plate II)

Wall II

A parallel wall to Wall I 85m long, with the same characteristics. The wall is located 8m to the south of Wall I. (Plate III)

Wall III

This wall is oriented N/S 13m long, connecting both wall I and wall II from their extreme Eastern end. This wall has also the same characteristics as the mentioned two walls, with an additional rounded shape 1.90m in diameter at its extreme southern end laid on gray hydraulic mortar (Plate IV).

Note: it is obvious that the three walls mentioned belong to the same construction.

Wall IV

A wall oriented N/S 25m long and 9m large, located in squares E and D, formed by 3 rows of blocks from different sizes. The dimensions of the largest block are 1.90m long, 0.45m large and 0.55 high. The wall is inclined towards the west. (Plate V)

Wall V

A wall oriented N/S 13m long located in square D, formed by 3 rows of blocks from different sizes. The dimensions of the largest block are 1.60m long, 0.75m large and 0.55m high. This wall could belong to Wall IV. (Plate VI)

Note: Both walls IV and V are going under the modern jetty, and their blocks are all built with header shape "stone laid across".

Columns

6 broken pink granite columns spread in the squares B and C, between wall II and the modern jetty. The 6 columns have the same diameter 0.95m and their lengths vary between 4.24m and 6m.

One gray granite column is found in square B, with different dimension, 0.55m in diameter and 5.40m in length. (Plate VII)

Note: we realized that different kinds of columns "specially pink granite" are spread all along the modern jetty and they are reused in its wave breaker.

The whole surveyed area contains random well-cut stones (mostly lime stone) mixed with ancient pottery as well as pieces of columns that are spread everywhere. They are mostly concentrated about 35m along the northern side of the modern jetty from square A to square F. (Plate VIII)

On the other hand the whole surveyed area is filled with sediments that are mostly accumulated in squares G and H, where cut stones and pottery shreds are still seen half hidden in the sand (Plate IX). Examining the sandy area by using a metal probe gives us a vivid picture about the buried features.

In addition, 3 major piles are spotted in different areas one of them in square D, and two in square H. (see map 1) (Plate X)

The Extension Area

The extension area (25m wide x 100m long) extending from the jetty towards the east (see map 1) has enormous quantities of sediments. However, well-cut stones mixed with pottery shreds are still seen in-groups. Pottery jars that are almost in full shape are raising the archaeological expectations of this area. Moreover, during the fieldwork using a metal probe "one meter long" we found out that more archaeological features are buried under the sand. Consequently, based on the mentioned observations and the typology of full shaped pottery that are *In Situ*, this area hosts major shipwrecks from different periods: Phoenician, Hellenistic, Roman, etc. (Plate XI).

PRELIMINARY CONCLUSION

The walls described above are part of an ancient harbor that could be as early as the roman period. Those structures are more visible in the western zone of the surveyed area. According to the nature of the bay, more identical structures that connect to the visible masonry should be extant in the eastern zone of the surveyed area and examining by probes gave this area high potential of its existence.

In fact, the sand deposition in the eastern part and especially at the entrance of the present harbor is due to currents dredging the sand to this specific area. Not to forget the presence of numerous pottery deposits and the almost full shaped jars that normally indicate shipwrecks.

The preliminary results of the mission indicates that the surveyed area holds enormous amount of man made features, harbor structures, columns, shipwrecks and a variety of pottery; in addition to large sandy areas that cover more ancient features.

Eventually, the area holds enormous potentials for future archaeological and scientific research projects and needs large teams of marine archaeologists, so to conduct future excavations. Needless to say, that this would require a considerable amount of time and large expenses.

IMPORTANT NOTE:

This report is to be kept highly confidential due to the important information concerning shipwrecks and archaeological features that could attract undesirable "treasure hunters" that do enormous destruction of the archaeological evidence.

PHOTOGRAPHS

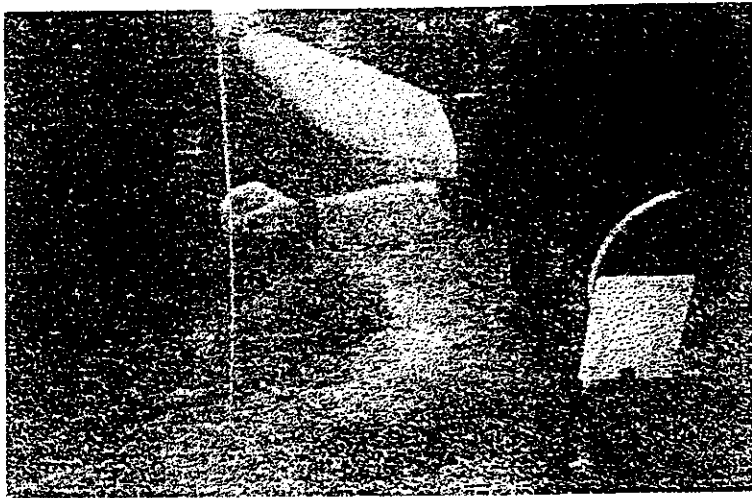
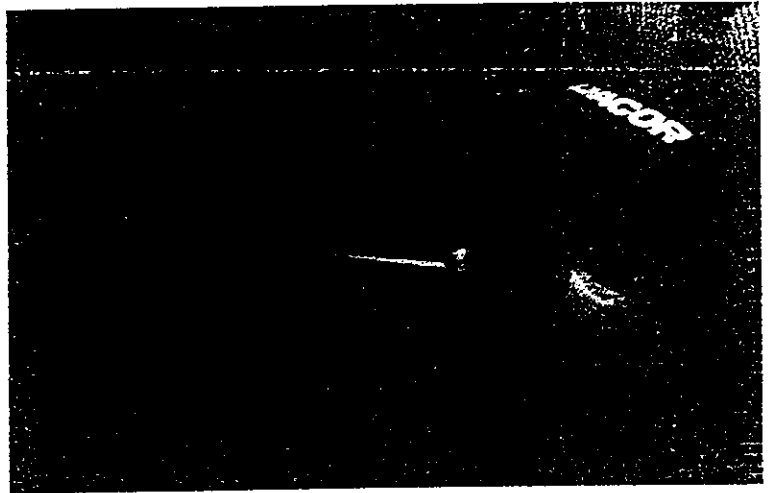
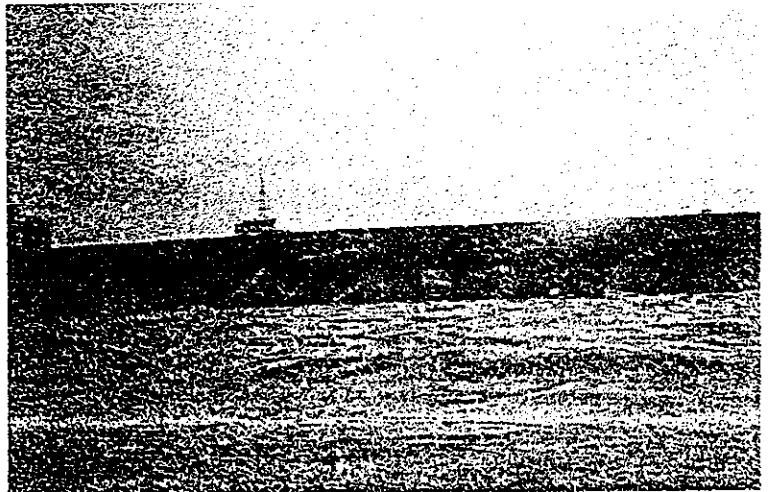


Plate I



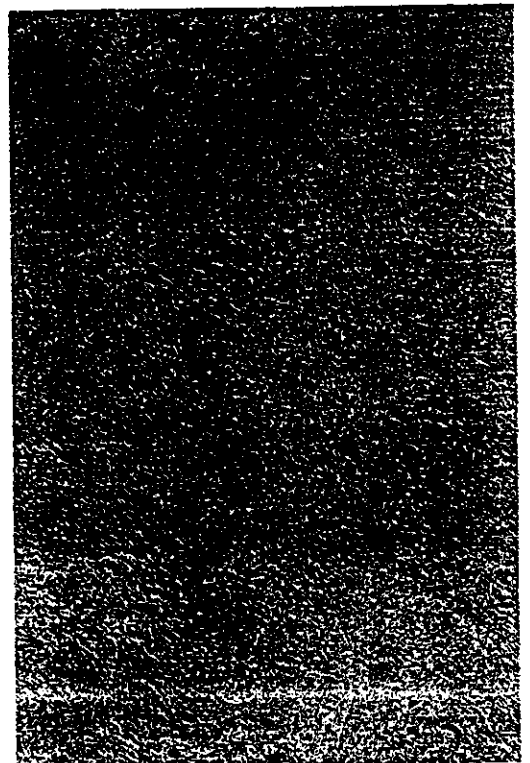
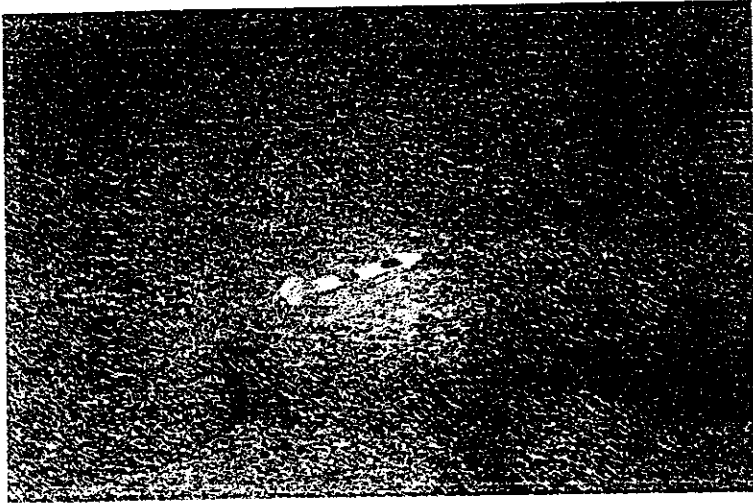
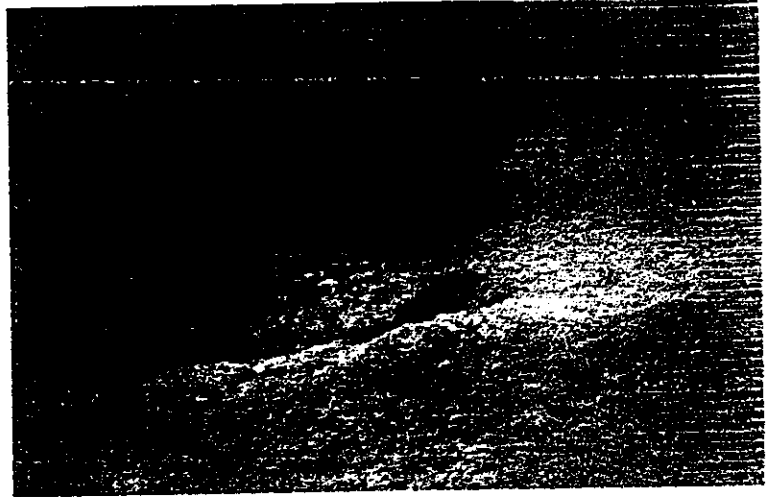


Plate II

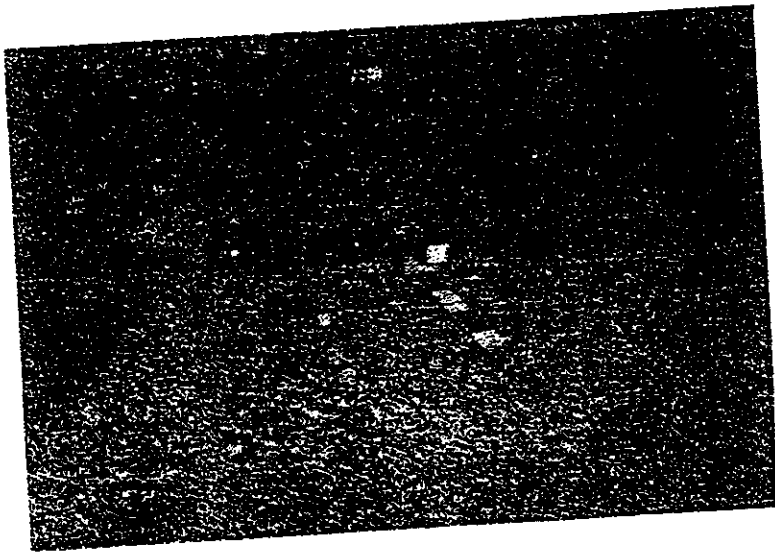
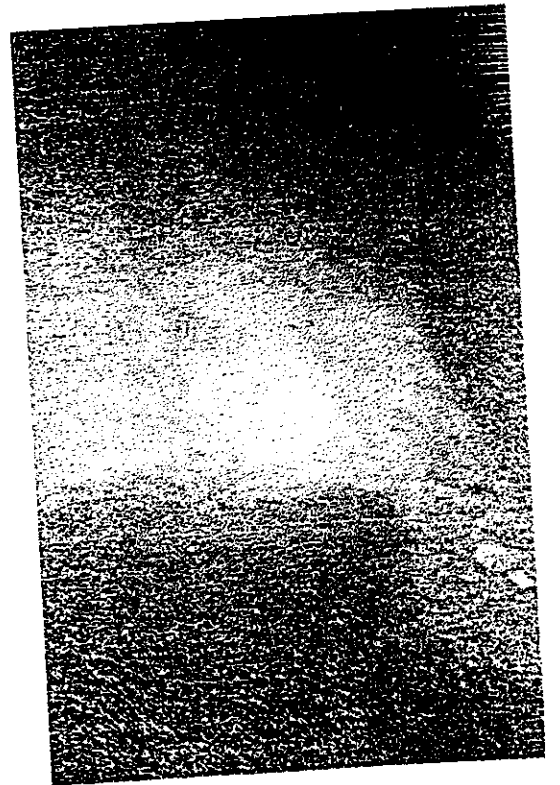
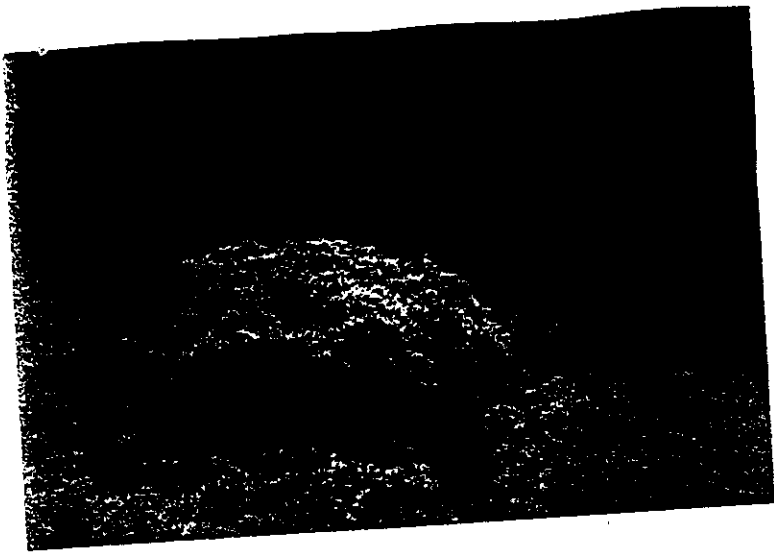


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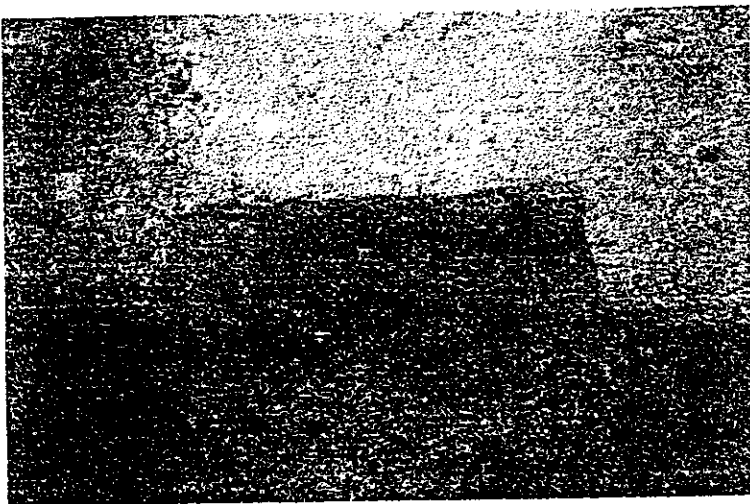
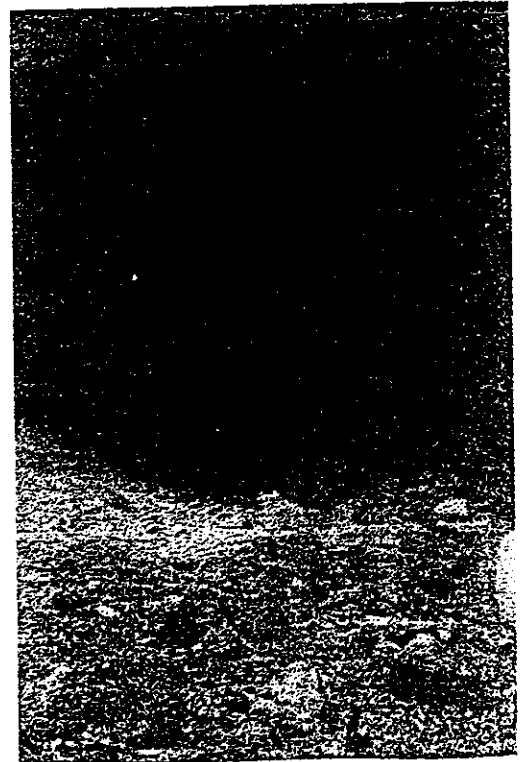
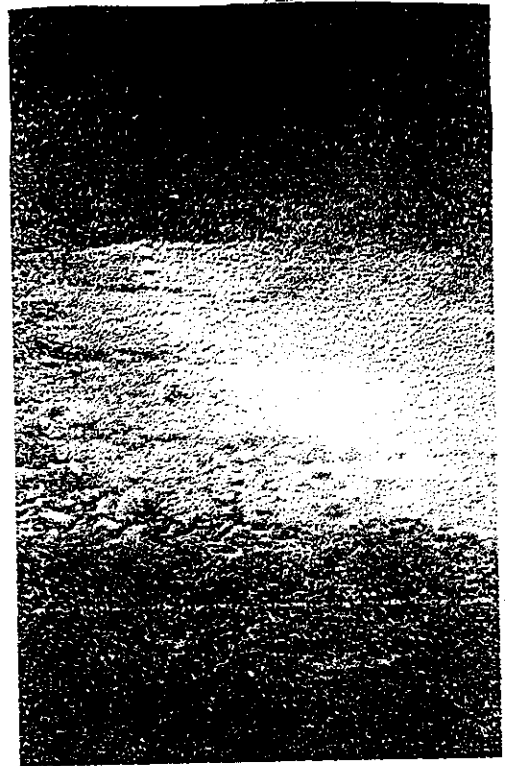


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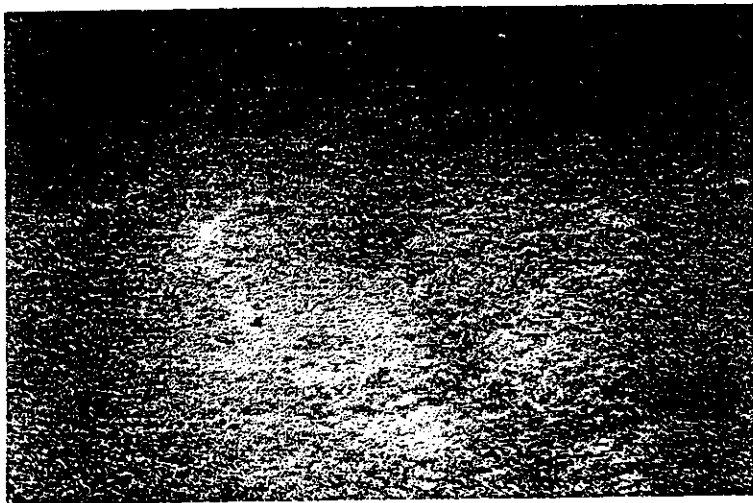
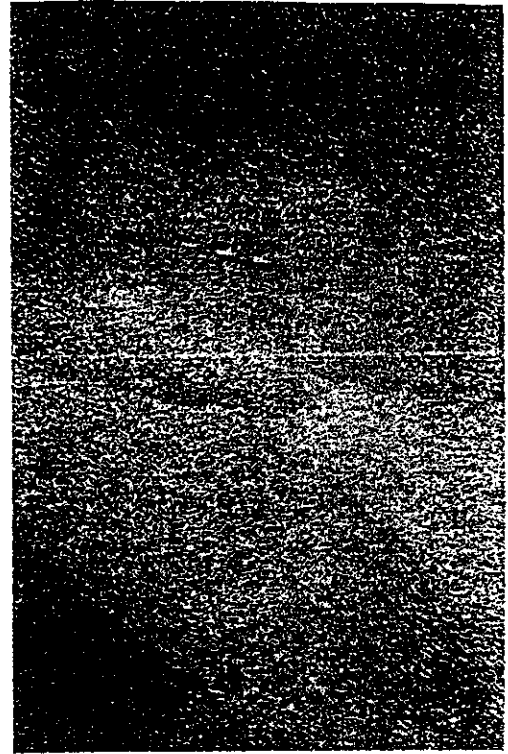
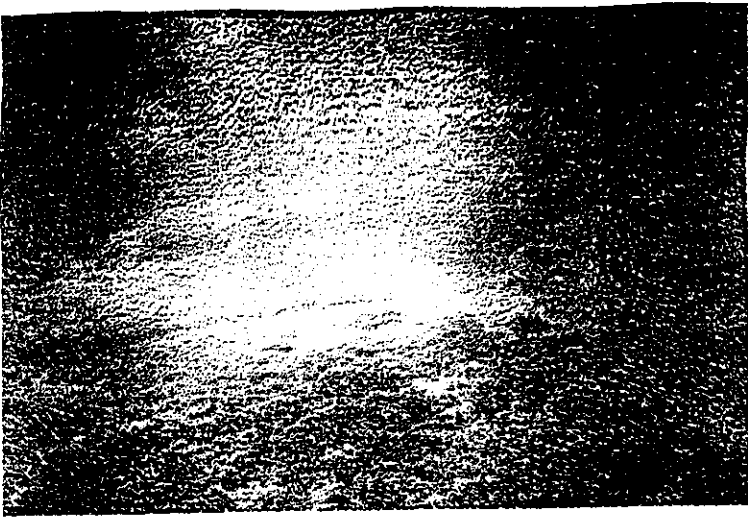
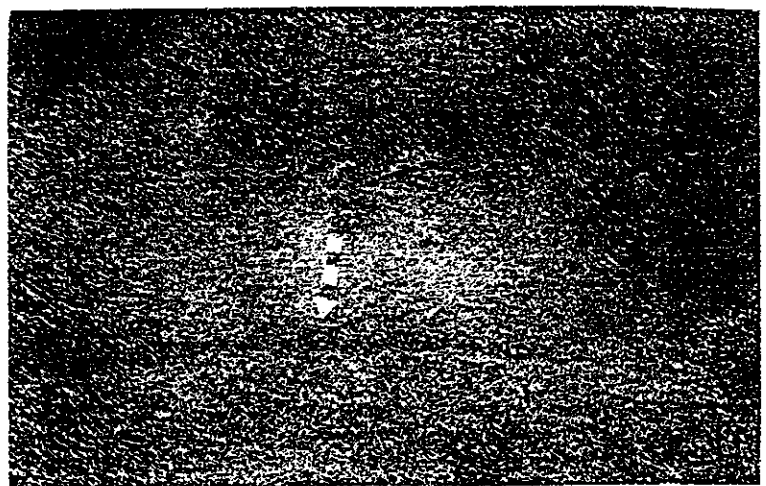


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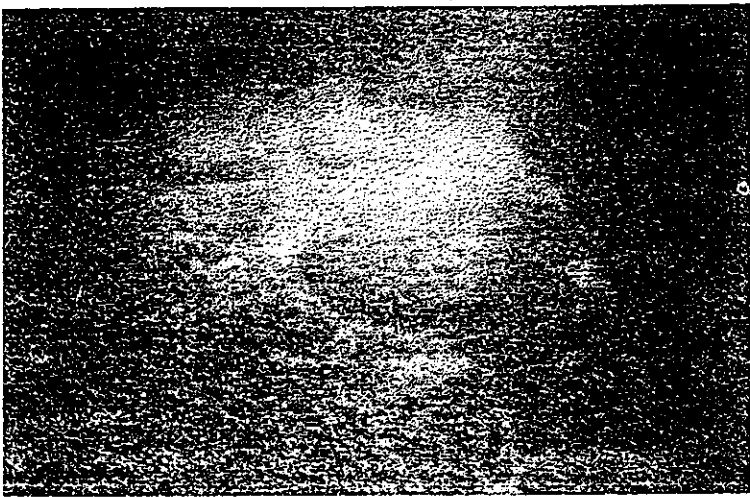
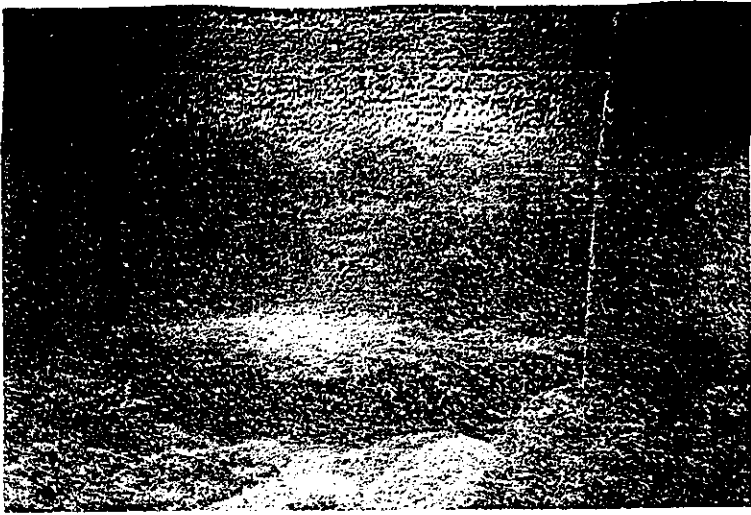


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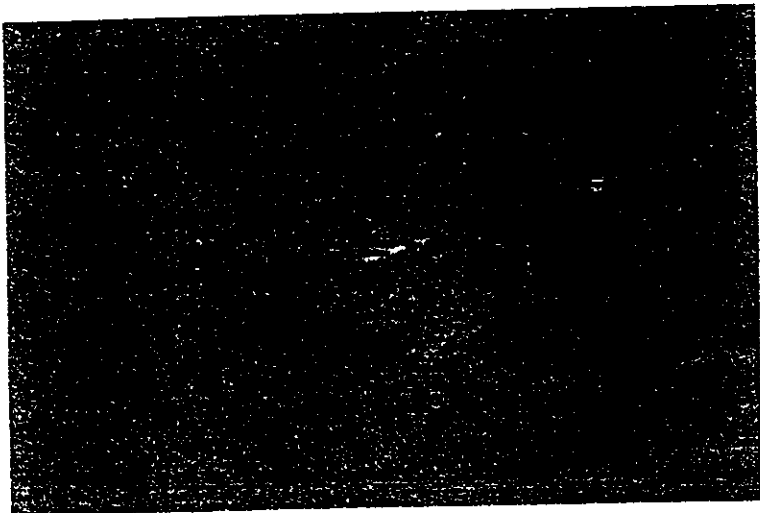
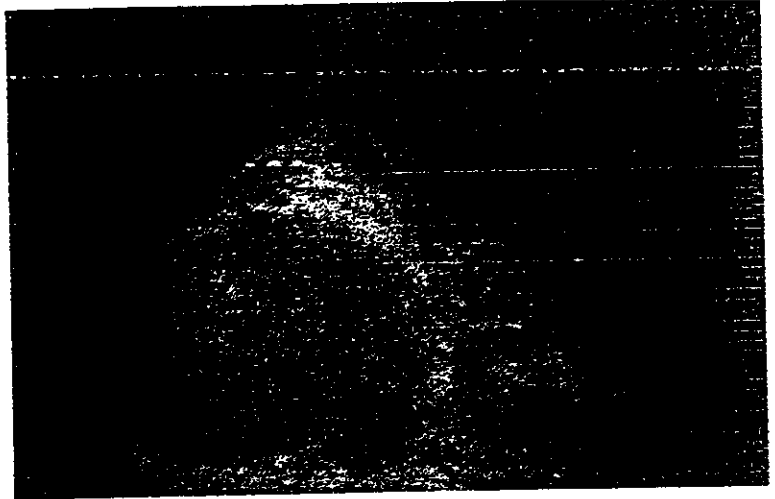
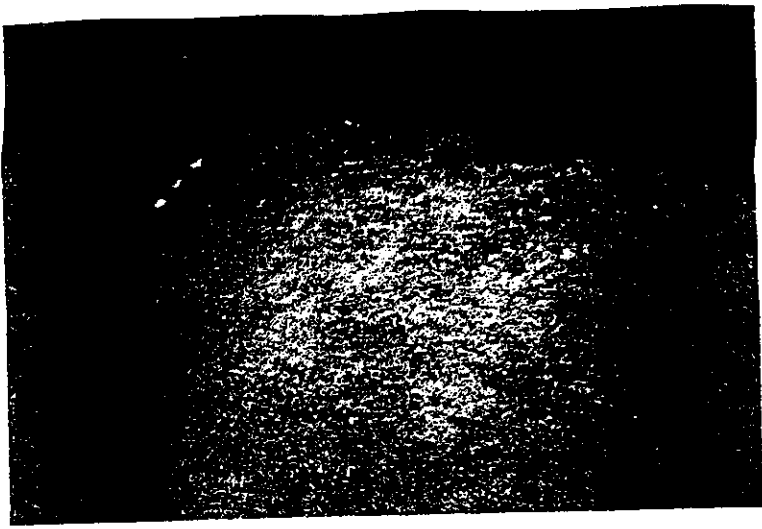


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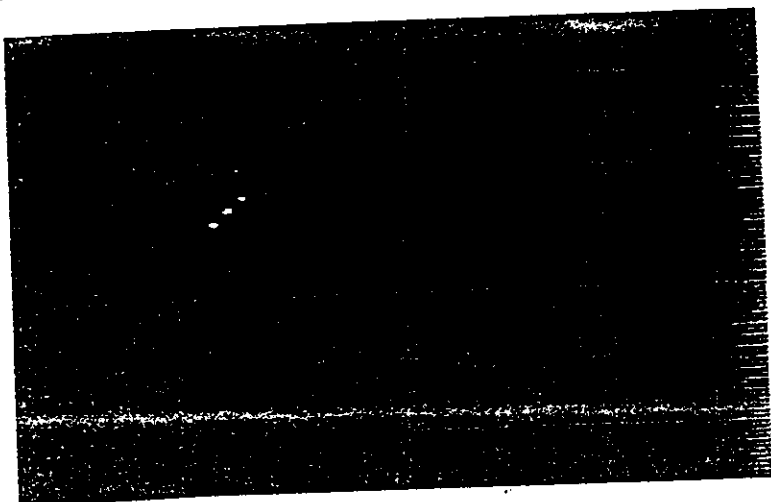
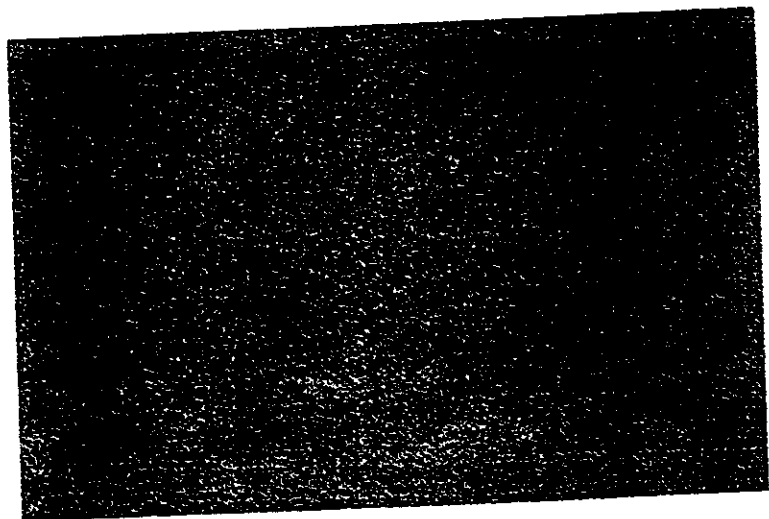
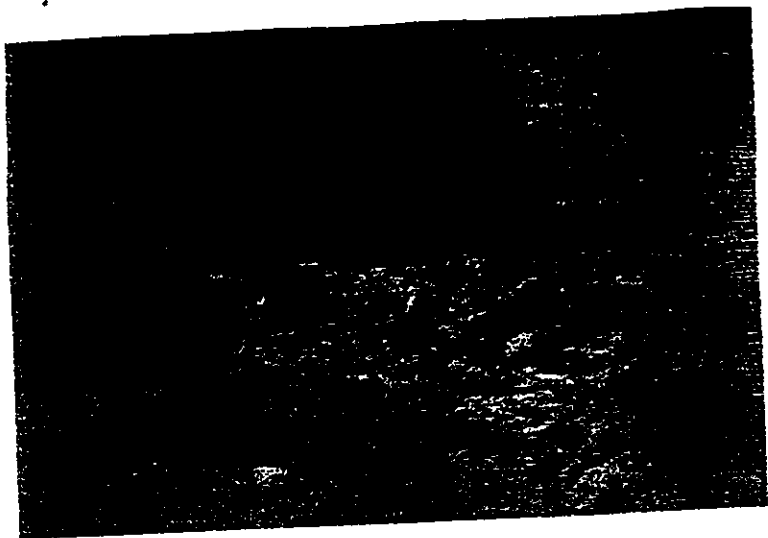


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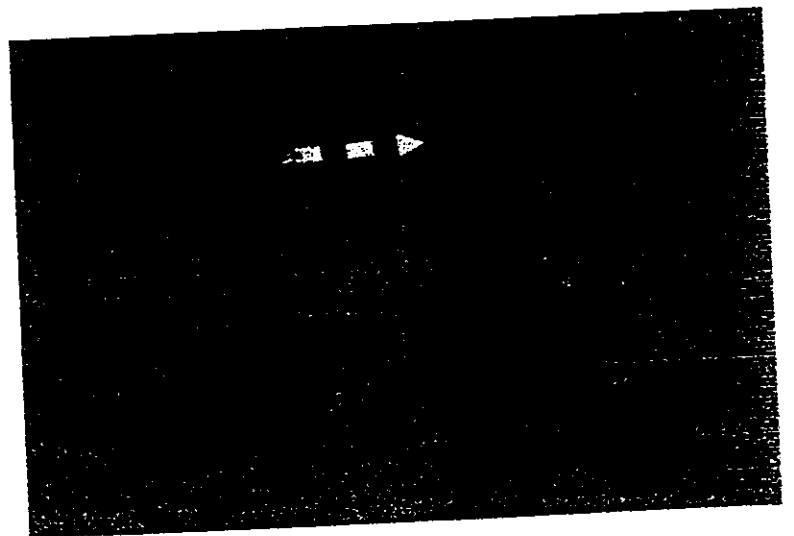
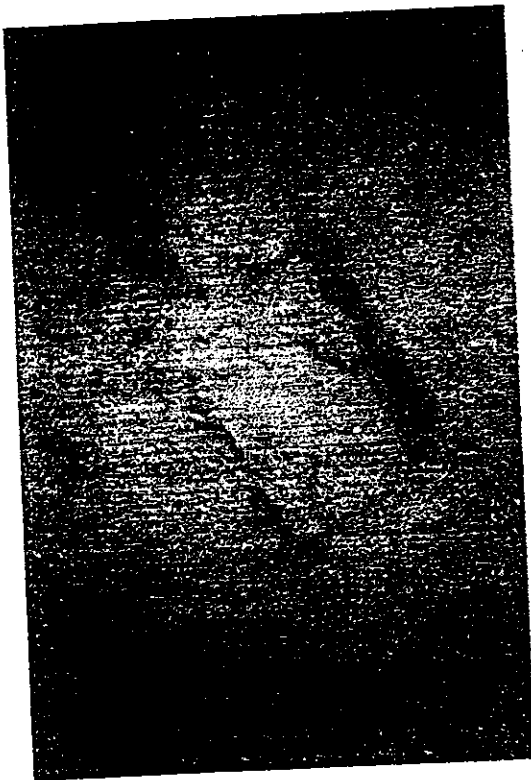
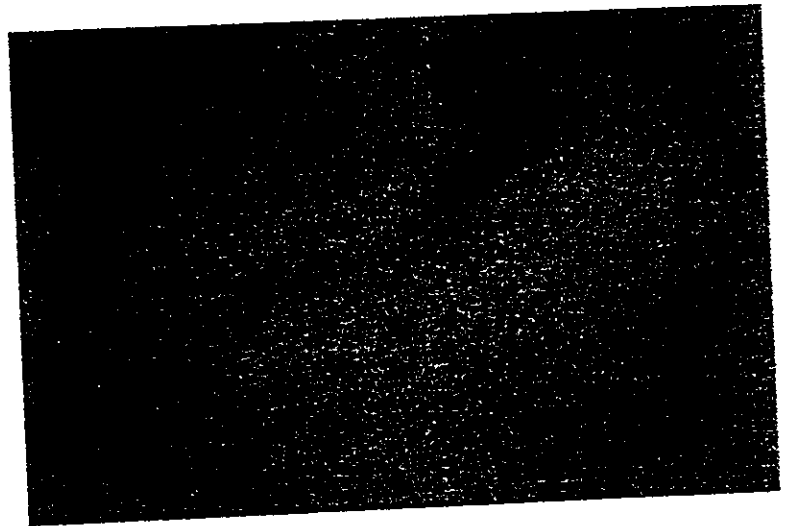
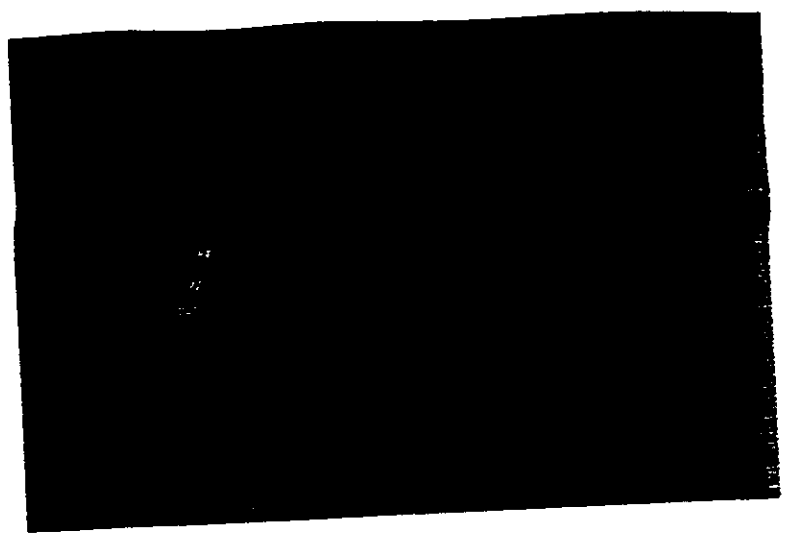
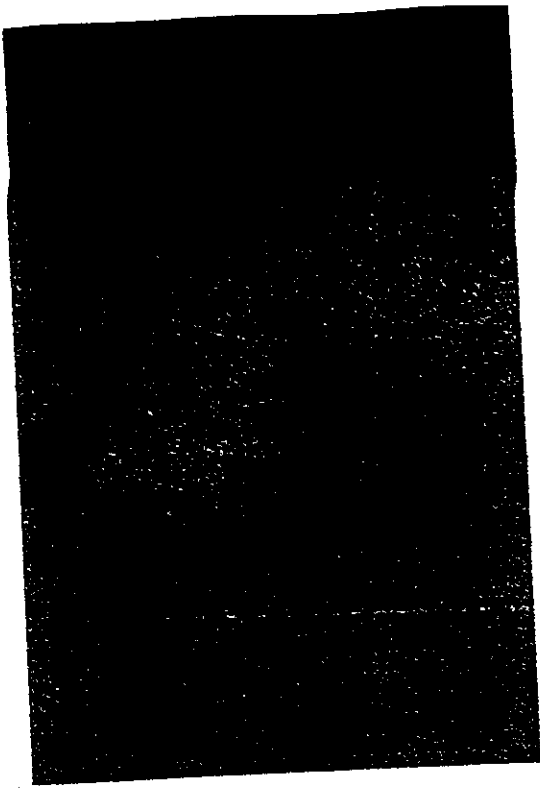


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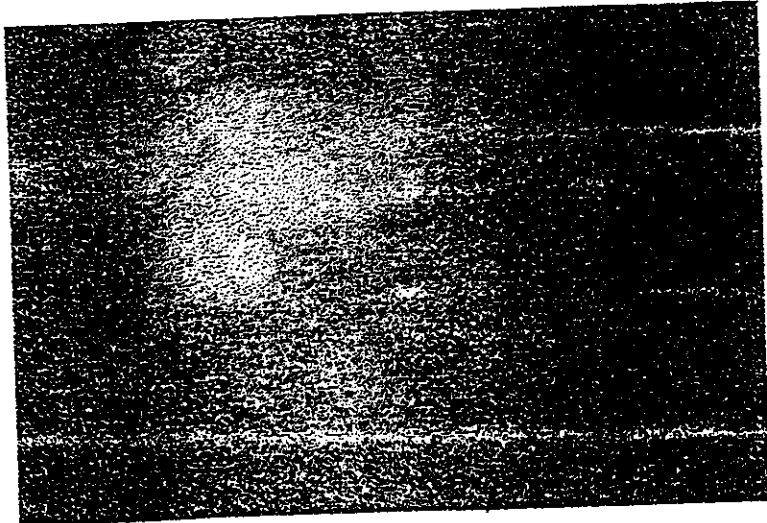
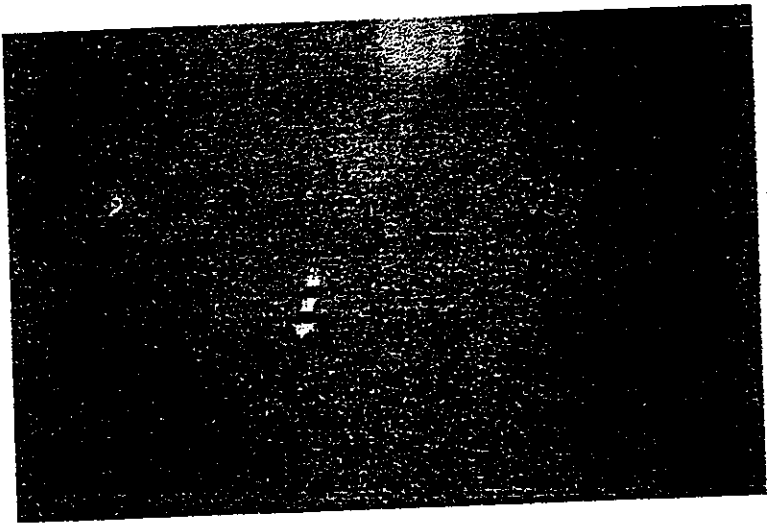


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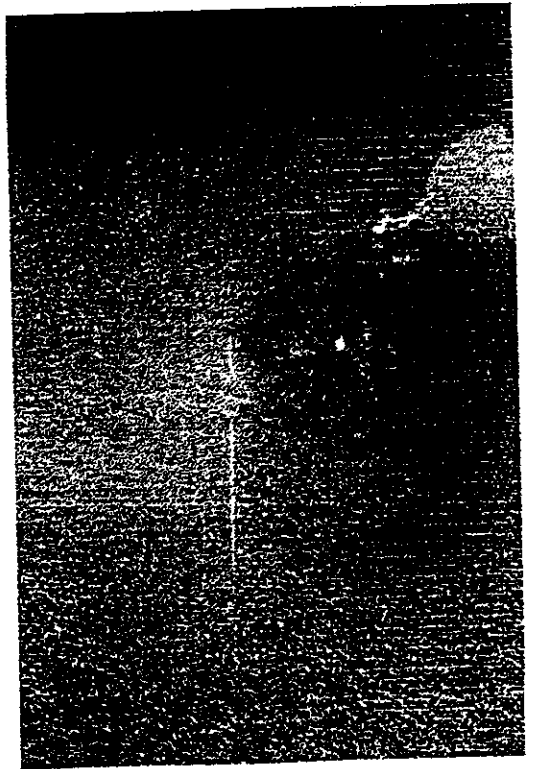
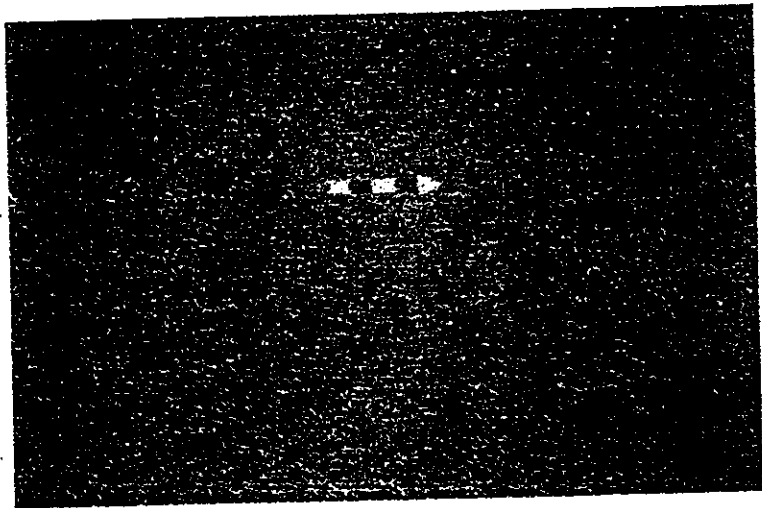
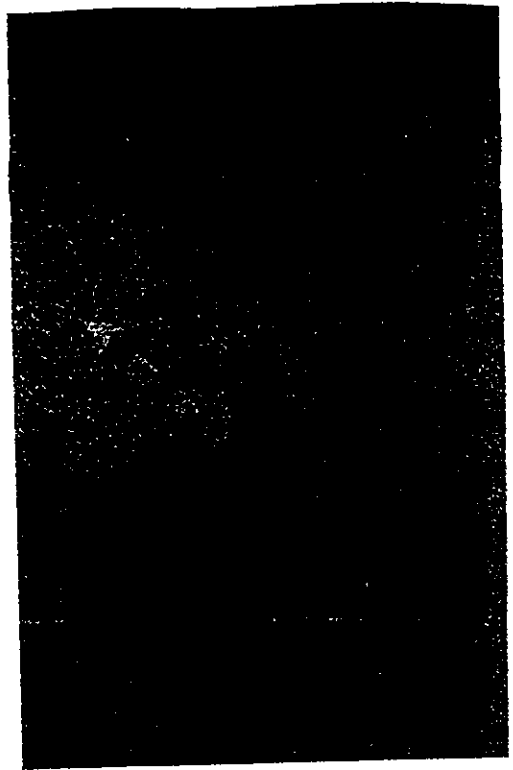
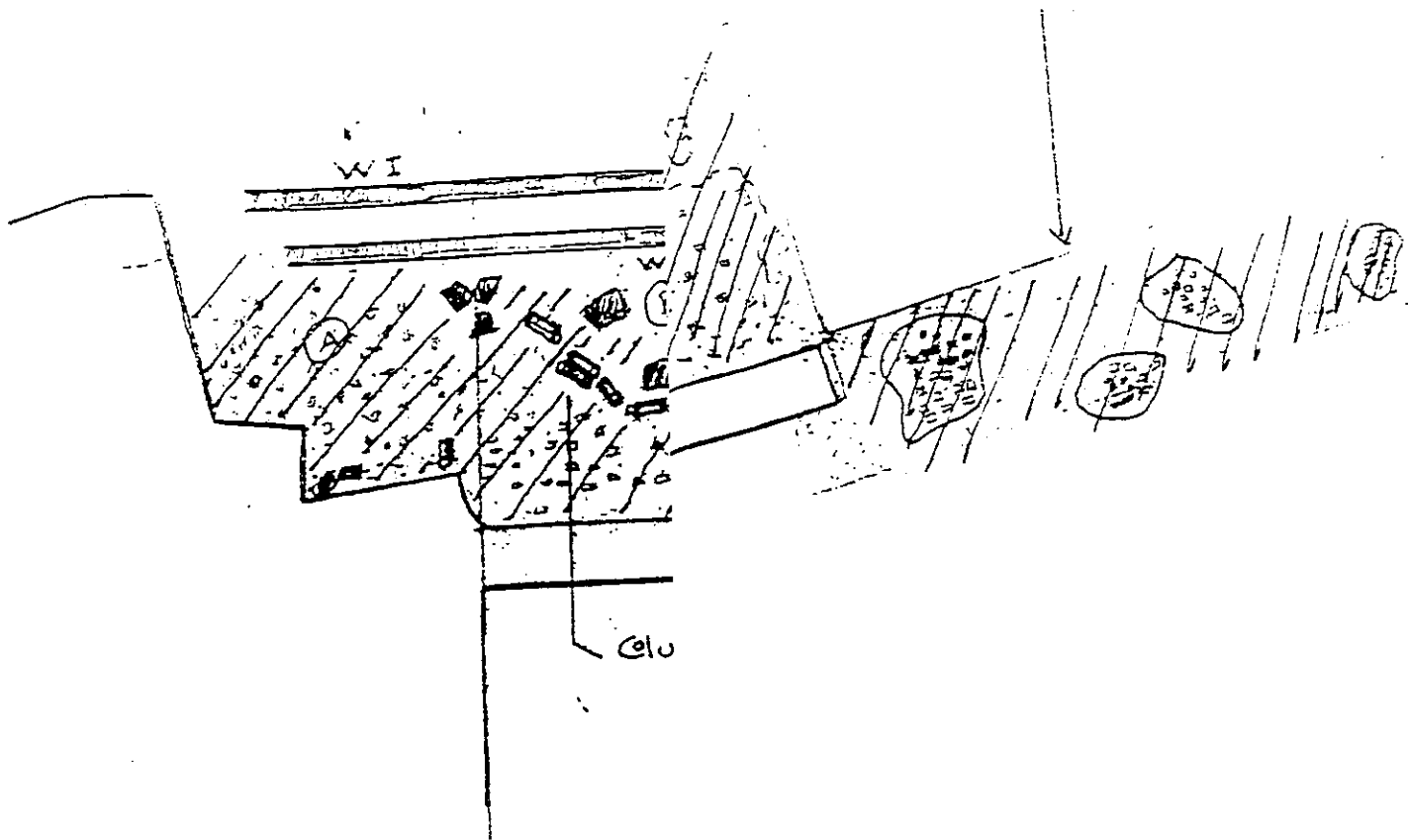
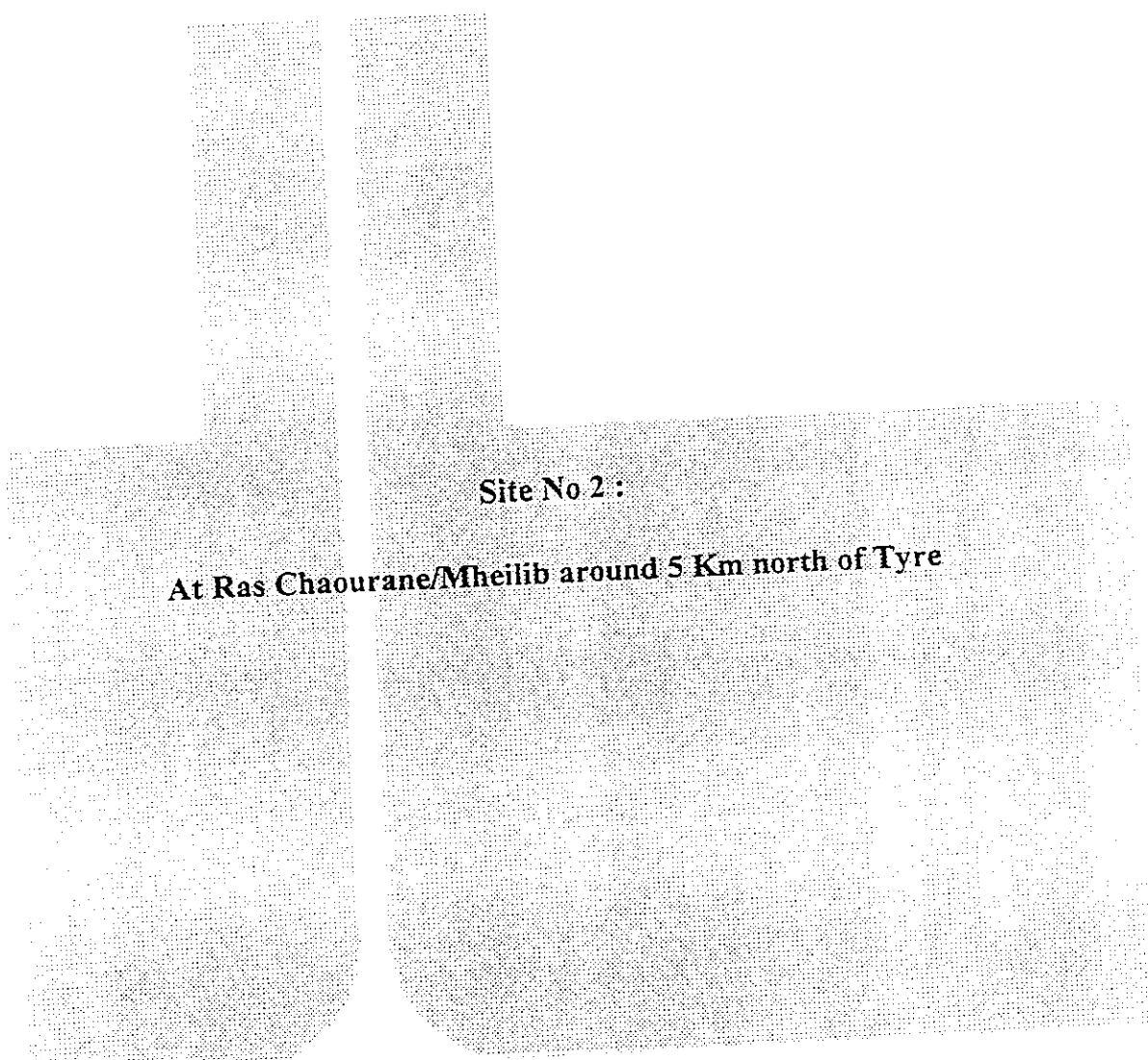


Plate XI

High potential of shipwreck



Tyre, Northern Harbor
General Plan
Scale, 1:125
March, 2001



Site No 2 :

At Ras Chaourane/Mheilib around 5 Km north of Tyre

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Beirut, March 2001

UNDERWATER SURVEY IN RAS CHAOURANE/MHEILIB

By
Ibrahim Nouredine and Michel Helou
© General Directorate of Antiquities
& The Authors

INTRODUCTION

In the process of a feasibility study conducted by Dar Al Handasah Nazih Taleb and Partners, concerning the archaeological inspection of Ras Chourane/Mheilib bay, an underwater assessment was needed to detect and observe any archaeological feature that might come into sight.

This assignment is a complimentary mission to the previous one that took place in Tyre's northern harbor with the same team of two Lebanese archaeologist divers. The team was asked by Dar Al Handasah Nazih Taleb and Partners, and approved by the DGA, to conduct preliminary underwater archaeological survey in Ras Chourane/Mheilib bay, which located some 5 kilometers north of Tyre.

From April 7th to April 10th, 2001, the team conducted four dives, in addition to extensive snorkeling and land survey.

Diving on the marked area "see area map" in the Chourane/Mheilib bay revealed the possibility to determine its potential to become a construction site. This area is flat and shallow and includes little sandy zones, which allows us to see more clearly the seabed. The sandy zones are few centimeters and they are covering a natural formation.

THE SURVEY METHOD

Two fixed points, Point A and Point B "54m long" locate the surveyed area. Point A is determined by the intersection of two angles $A_1 = 140^\circ$ (NL) at the extreme south corner of the house #28. $A_2 = 57.5^\circ$ (NL) at the extreme north corner of the house #23.

Point B is determined by the intersection of two angles $B_1 = 185^\circ$ (NL) at the extreme south corner of the house #28. $B_2 = 62^\circ$ (NL) at the extreme north corner of the house #23 "see area map".

The surveyed area was divided into two squares stretching from points A, B. Each Square is 54X54m and buoys marked all angles, (plate 1)

The nature of the area is very shallow, depths vary from 0.5m to 1.5m. Therefore, the whole marked area was surveyed by extensive snorkeling using a rope between us (length depends on the visibility)

Two extension areas were added to the zone first extension located to the south "see area map" and the second extension area (100m long X 54m wide) was added to the west was surveyed by scuba diving using the "parallel search system (plate 1)

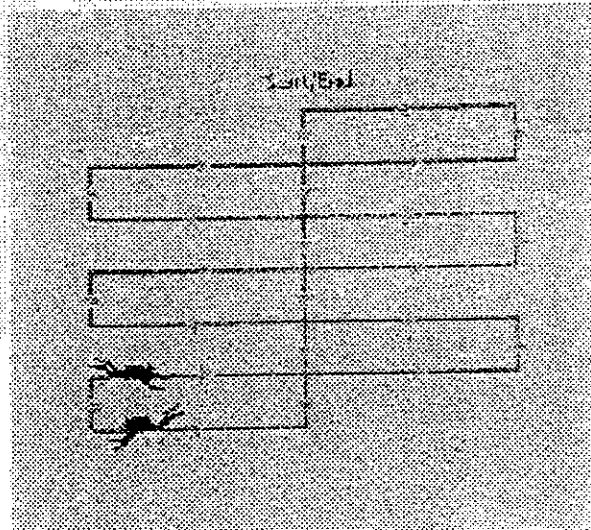


Illustration of The parallel Search System

SUMMARY

The result of the survey work in Ras Chourane/Mheilid indicates that the whole surveyed area has no archaeological features, where the seabed is clear. In addition to few centimeters of sandy zones located in the northeastern side near the coast (plate 2) and (plate 3). The area is not accessible for ships due to the extreme shallow waters.

After being informed by Mr. Ali Badaoui and Mr. Assaad Seif, about some archaeological potential in Ras siddine el Bahr one kilometer to the south from our site. We realized some ancient quarries where some Classical Sarcophagus covers are spreading on the shoreline "see general map", in addition to well cut stones (plate 4).

PHOTOGRAPHS

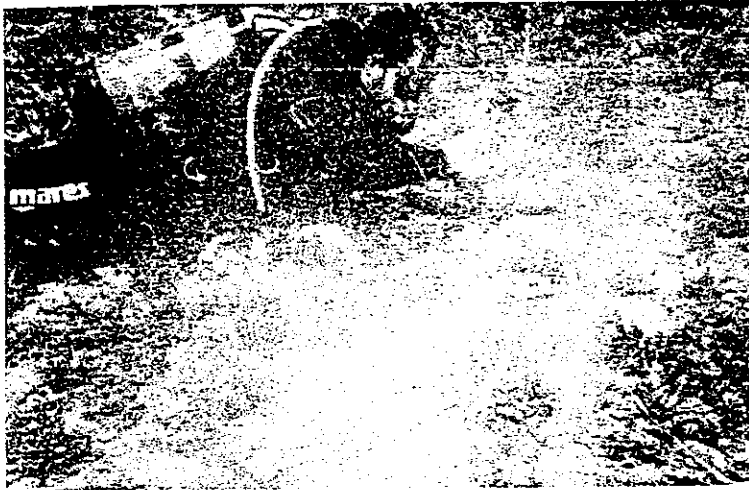
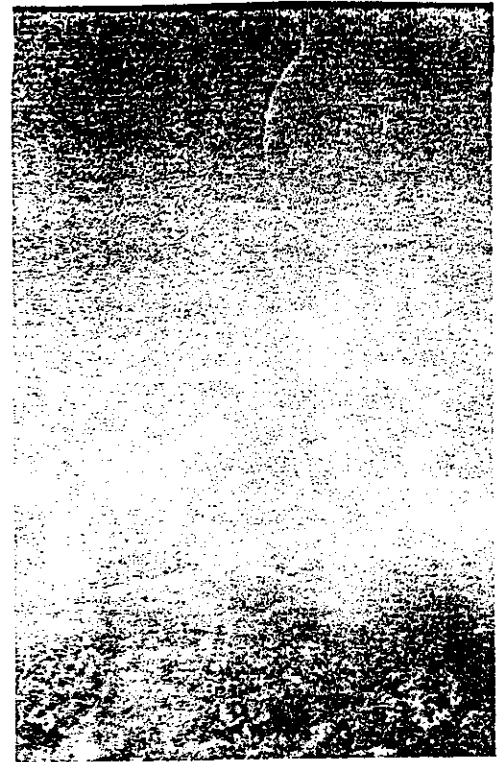
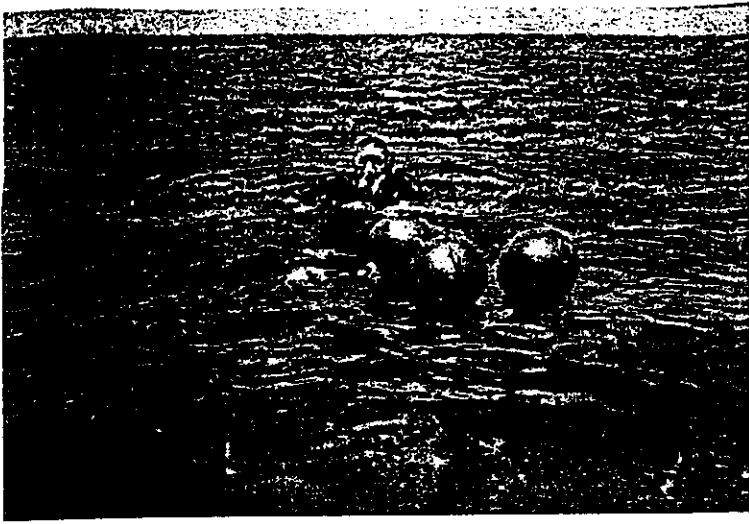


Plate 1

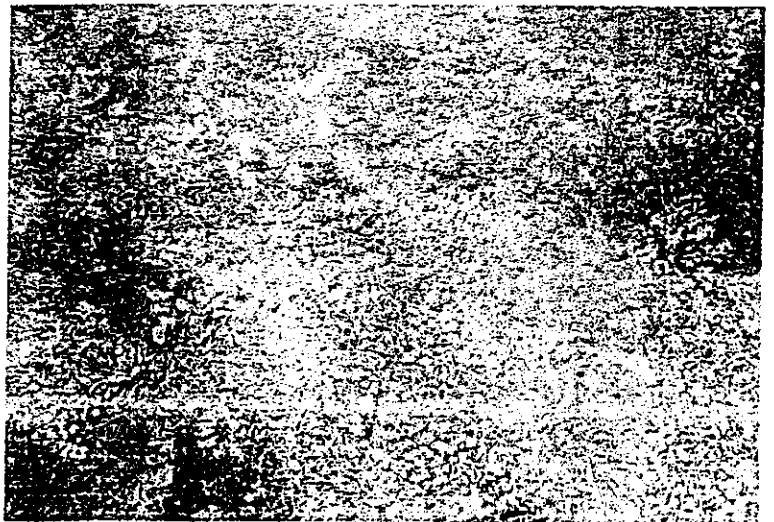
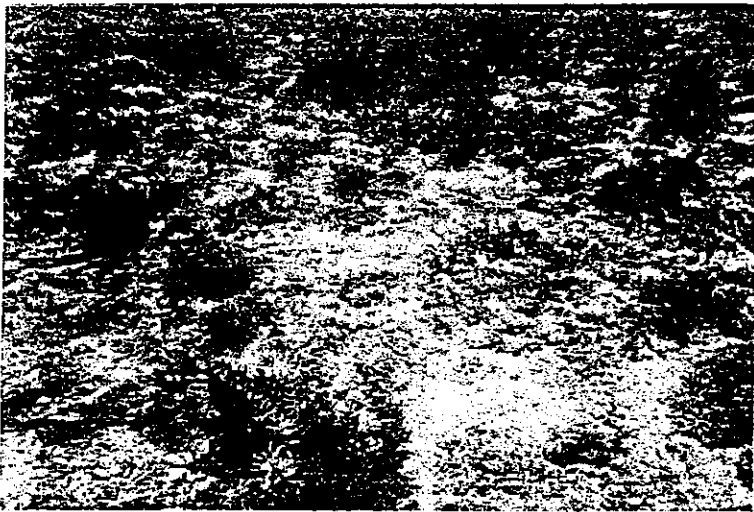
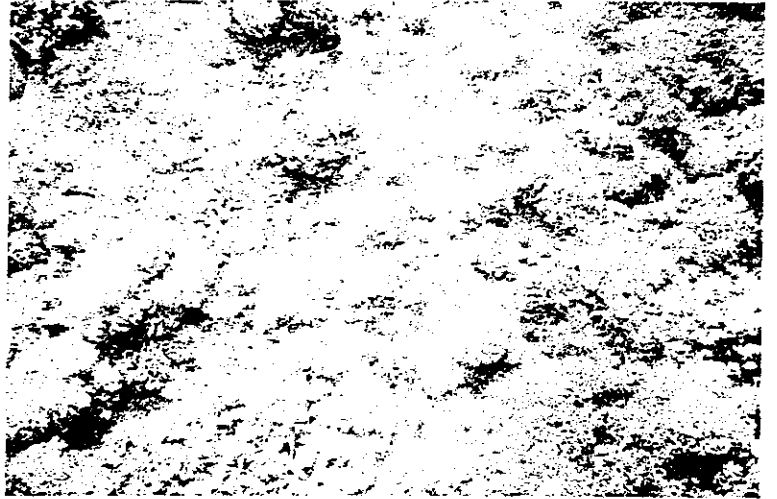
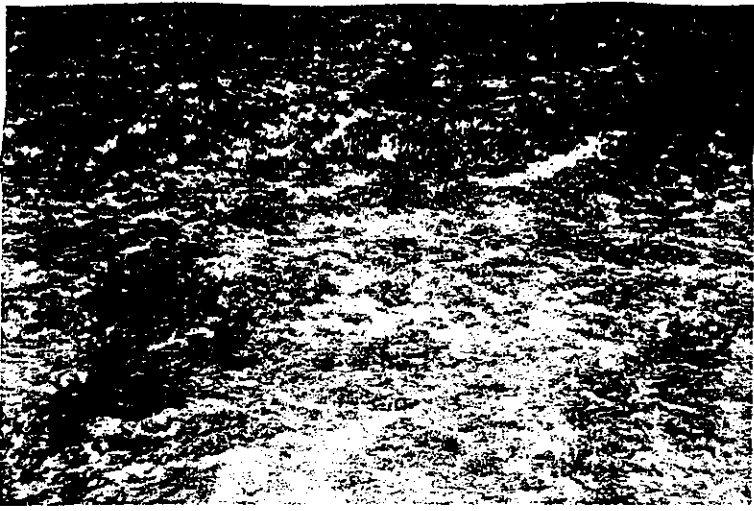


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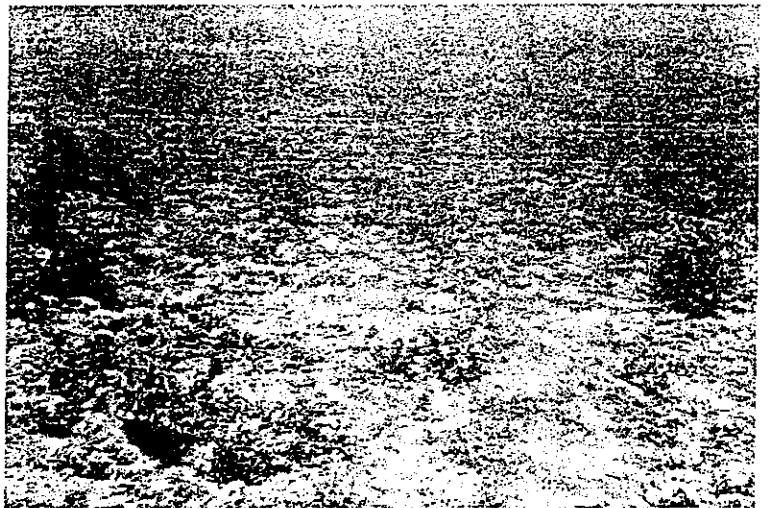
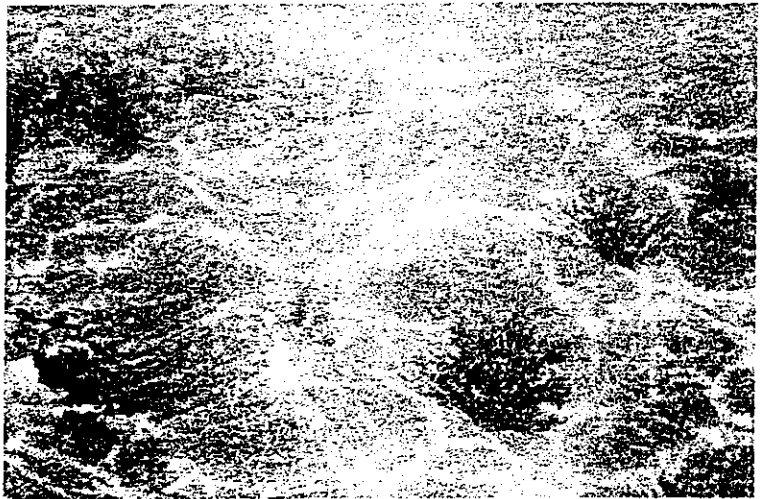


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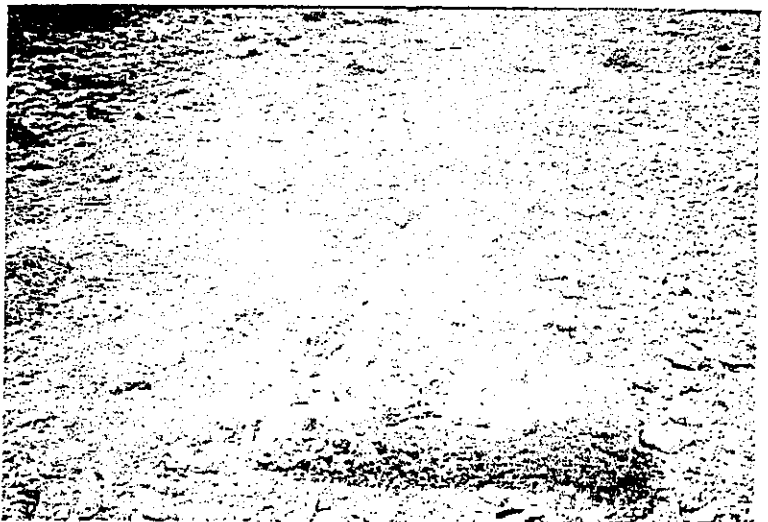
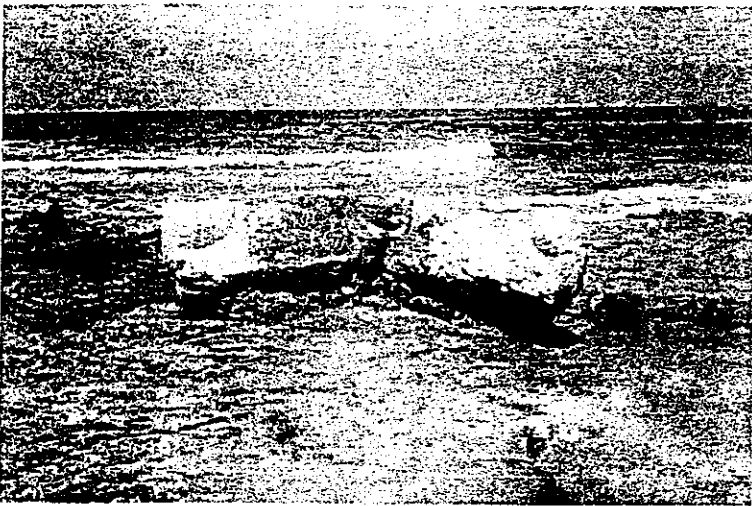
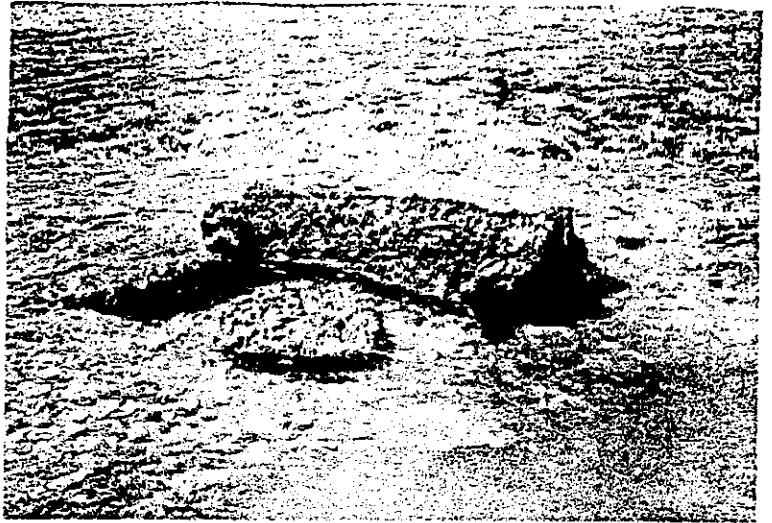
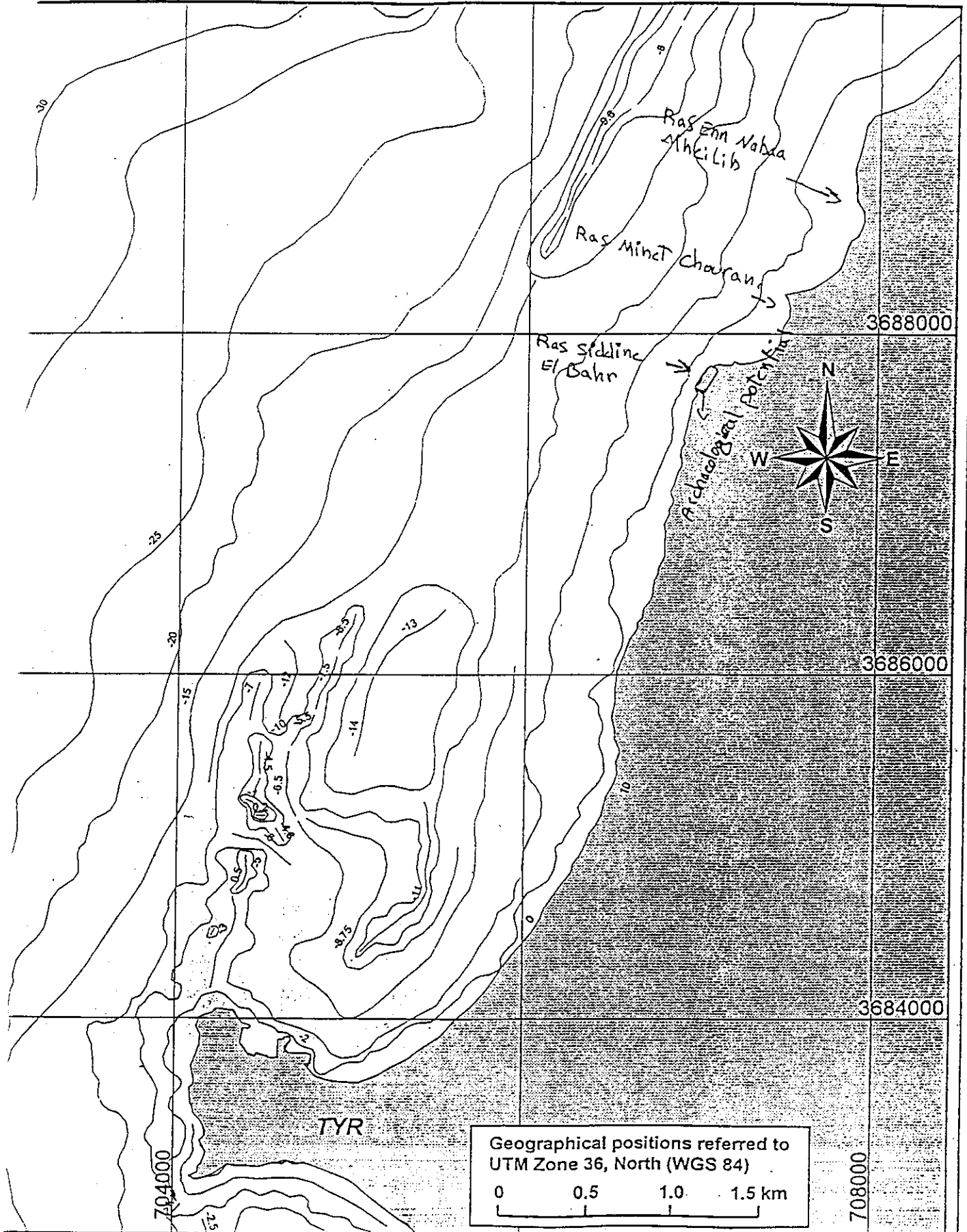


Plate 4



General Map

Jamil L. Taleb
Dar Al Handasah Nazi Taleb and Partners
Bashir Kassar Street, Verdun Sector
P.O.B. 8198
Beirut Lebanon
Ref. L9908/10635

London, 12.02.01

Dear Mr Taleb

Archaeological Impact Study Tyre Port (North)

In answer to your letter of February 9th, our previous telephone conversation and past correspondence (regarding a marina on the beach to the north of Tyre), I do not think there can be any "quick fix" regarding the ubication of Tyre's ancient, now submerged harbourworks, wrecks, anchorages etc. without a geological survey of the entire area, because the evidence for sea-level change, as well as erosion and sedimentation are all very strong.

Antiquities seldom lie on the surface of a sandy or muddy sea-floor, like ancient remains on land they are usually more, or less covered. Companies laying pipelines frequently – but privately – confess to having cut through ancient stone structures and also wrecks. Experienced archaeologist divers may be able to tell from the neck of a single amphora that a wreck lies hidden beneath it. On rocky bottoms such as reefs, burial is unlikely and man-made objects may be camouflaged by no more than marine growths.

At Tyre, if your present project is restricted to the area just outside the port's northern breakwater then, depending on weather conditions, depth, type of bottom and given visibility of a least a few metres (in Lebanon the best season is September), then a swim-line-team lead by Bob Nureddine and Michel Hérou might suffice. This technique involves men swimming abreast between two fixed points with a chord of x metres (depending on visibility) stretched out between them, to make sure that their field of vision overlaps. Markers are then dropped on man-made objects, soundings may have to follow before results can be evaluated.

The situation will be different beyond the immediate area of the breakwater, towards the reef-rocks (where local families now picnic at week ends). For instance on the southern reef (which formed Tyre's "Egyptian anchorage") quantities of Tanit figurines, ancient anchors etc. have been found, mostly by fishermen. More sophisticated techniques including sub-bottom profiling, are needed in order to understand the geological changes which have occurred on such reefs since antiquity. For similar reasons, if a marina were to be built on the shore to the north, it would be valuable to have core-samples examined by an experienced sidimentologist.

I shall be in Lebanon for the UNESCO meeting at Sidon (May 28 to 31) and could arrive a few days beforehand. Afterwards, I will stay on until at least the 6th of June for a meeting at the AUB.

I hope we can meet around these times;

With kindest regards, yours sincerely



Honor Frost

c.c. Messers Joseph Kreidi and Bob Nureddine

DAR ALHANDASAH - NAZIH TALEB Consulting Engineers	
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03 MAR 2001	
BEIRUT	
SERIAL NO. 7814	FILE NO. L9908



Facsimile Transmittal

To: Miss Honor Frost
Fax Number: +44 207 487 3971
From: Jamil Taleb
Date: February 26th, 2001
Subject: Archeological Impact Study - Tyr Port
Reference: L9908g / 10704
No. of Pages: 1

Dear Miss Frost,

Thank you for your letter of February 12th. The information provided is well noted and will be taken into consideration.

Bob Nouredine and Michel Helou will be starting to carry out their underwater exploration mission as of early next week. The "Direction Générale des Antiquités" (Director General Frederic Hussein and Mr. Assad Seif) will be closely following up this mission. Bob and Michel will also be getting in touch with you for possible guidance (unfortunately from a distance for now) during their diving period.

It would definitely be of help to us if you could arrive to Lebanon a few days before the UNESCO meeting at Sidon in May.

Please let us know if we can assist in any arrangements for your trip and stay.

We Remain Sincerely Yours

DAR AL HANDASAH NAZIH TALEB & PARTNERS

Jamil N. Taleb, M.E.
Deputy General Director

cc: Mr. Frederic Hussein - DGA
Mr. Joseph Kreidi - UNESCO

JT/sk

الجمهورية اللبنانية

مكتب وزير الدولة لشؤون التنمية الإدارية
مركز مشاريع ودراسات القطاع العام

Monday, 12 March, 2001

Dear Honor,

Hope you are doing well after the hard times you've had. Michel and I have started the survey in Tyre's fishing harbor (northern side) after being asked by DAR AL HANDASAH to do so with the coordination of the DGA. We would have preferred to do this survey later on and under your supervision, but DAR AL HANDASAH had no time to postpone this project. The area we are surveying is flat and shallow. The depths vary between 3 and 6 meters. We have divided the total zone into squares where we survey each square individually. We start by snorkeling on the water surface using a rope between us (length depends on the visibility), and continue by scuba diving using the parallel system. We end up measuring, mapping and photographing the archaeological features.

We will be sending you further information as we go along.

Sincerely,

Bob Nouredine Michel Helou

Republic of Lebanon
Office of the Minister of State for Administrative Reform
Center for Public Sector Projects and Studies
(C.P.S.P.S.)