
REPUBLIC OF SERBIA
Ministry of Infrastructures



EU Delegation to the Republic of Serbia



Tender Dossier

VOLUME 3

**Survey and Removal of Unexploded
Ordnance (UXO) from the Danube River
(PRAHOVO Section)**

November 2010

VOLUME 3

TECHNICAL SPECIFICATIONS

Survey & Removal works for indefinite quantity of UXO)

IPA 2010: "Survey and Removal of Unexploded Ordinances (UXO)

from the Danube River"

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LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Explanation</u>
AP mine	Anti Person mine
AT mine	Anti tank mine
EMR	Electromagnetic Radiation
EOD	Explosive Ordnance Disposal
EOR	Explosive Ordnance Removal
IMCA	International Maritime Contractors Association
IMSMA	Information Management System for Mine Action
FFE	Free From Explosive
FM	Field Module
GIS	Geographical Information System
GM	Global Module
MAC	Mine Action Centre
MCD	Mine Clearance Diver (Underwater EOD)
MEC	Munitions & Explosives of Concern
PPE	Personal Protection Equipment
QAS	Quality Assurance System
QAP	Quality Assurance Plan
QCP	Quality Control Plan
RF	Regulated Fuse
ROV	Remote Operated Vehicle
RS	Republic of Serbia
RSP	Render Safe Procedures
RTC	Real Time Coordinate
SOP	Standard Operating Procedures
ToR	Terms of Reference
UN	United Nations
UN IMAS	UN International Mine Action Standards
UXO	Unexploded Ordnance (Air bombs, rockets, cluster bombs, etc.)
UW EOD	Underwater EOD (MCD)
VT	Variable Time



1 INTRODUCTION

1.1 Technical specifications

This report, “Volume III, Technical Specifications” describes the requirements the Contractor needs to fulfil and covers the technical specifications for the clearance works of UXO on the River Danube along PRAHOVO port including land and underwater removal for indefinite quantity of UXO. This includes the general survey for the roads access and areas (tracks, base camp, workplace, etc.) for cluster-bombs clearance all around the site between riverbanks and land. These access roads, tracks, and all areas cleared will be marked with plastic bags and maintained in perfect conditions.

This report is an integral part of the Tender Documents prepared for the UXO clearance works and must be considered in close relation with:

- Volume I: Instructions to Tenderer
- Volume II: Contract
- Volume IV: Breakdown of the Lump-sum Price (Bill of Quantities)
- Volume V: Drawings

1.2 Change orders

It is possible that the contract of which these Technical Specifications form a part may, in appropriate circumstances, be modified to permit additional works and additional funding therefore. Any such modifications will only be permitted if they can be agreed before the expiry of the financing agreement under which the initial contract was financed and if the additional funding is available from the same budget line as that used for the initial contract.

All changes to the contract will and can only be directed in writing by the EU Delegation.

Any oral or written directions, instructions, explanations, commitments and/or acceptances provided to the Contractor by any other person than the EU Delegation shall not be construed by the Contractor as a change in the statement of work.

If the Contractor accepts and/or executes such directions, proposed changes, instructions, explanations, commitments and/or acceptances, the EU Delegation will not approve/pay for such changes.

1.3 UXO definition

Unexploded Explosive Ordnance (UXO) are defined as *“Military munitions that have been primed, fuzed, armed, or otherwise prepared for action, and have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installation, personnel, or material, and remain unexploded either as a result of malfunction, design, or any other cause”*.

In certain cases, an encountered UXO item will be unsafe-to-move. Assessment of a UXO and determination of whether it is safe-to-move depends upon many factors.

Clearance operations are undertaken to neutralize all UXO blocking the shipping channels in ports, and navigable waterways. After neutralisation and recovery of all UXO, the complete area has to be “resurveyed” to ensure that all suspicious objects are removed from the riverbed.



2 GENERAL PROVISIONS

2.1 Nomenclature

The terms such as: Contract, Specification, Drawings, Contracting Authority, Contractor, Supervisor, used within this Volume, shall be interpreted in accordance with AIDCO document, General Conditions for Works Contracts financed by the EU Delegation.

2.2 Relation with other Tender Documents

The Conditions of Contract, the Drawings and other Contract Documents shall be read in conjunction with the Technical Specifications, and matters referred to shown or described in any of the former are not necessarily repeated in the latter.

Notwithstanding the sub-division of these Technical Specification under different headings, every part of it shall be deemed supplementary to and complementary of every other part and shall be read with it or into it, as far as it may be practicable to do so.

2.3 Responsibility of the Contractor

Where the approval of the Supervisor is required under these Specifications, such approval shall not relieve the Contractor of his duties or responsibilities under the Contract.

2.4 Specific requirements for Contactor

The Contractor shall provide all labor, management, tools, materials, equipment and transportation necessary to perform the land, wetland and underwater subsurface UXO removal, unless specified herein. The Contractor shall furnish the required UXO/EOD-qualified personnel, EOD equipment, EOD instruments, and UXO transportation, as necessary, to accomplish the required UXO works and furnish to the relevant authorities reports and other data, together with supporting material developed while providing UXO support works. During the implementation of UXO support activities, the Contractor shall provide also adequate professional quality control to ensure the quality, safety, and completeness of the work.

No equipment is to be purchased on behalf of the Contracting Authority / beneficiary country as part of this works contract or transferred to the Contracting Authority / beneficiary country at the end of this contract. Any equipment related to this contract which is to be acquired by the beneficiary country must be purchased by means of a separate supply tender procedure.

Contractor will ensure all certifications required by EU and local requirements are provided, as well as security of the material.

The Contractor **MUST** offers the entire range of works for clearing UXO both on land/wetland and underwater, including:

- Highly qualified and experienced personnel (for more details; see Appendix IX – Personnel qualifications) provided from initial survey and recovery to disposal and ensuring the work is subjected to the minimum of delays and is carried out in the safest possible manner
- SOP's, site-permission demining and UXO-contract accreditation from relevant Serbian Authorities (the workplace, the site installation and all equipment used by the Contractor must be according to the following directives of the EU and/or the according laws of the member states)
- Preliminary exploration for risk analysis which may include the following: EOD risk mitigation
- Determination of possible approaches for location of underwater UXO or anomaly investigation
- D-GPS supported surface probes on land, wetland and underwater
- Identification and recovery of UXO both on land, wetland and in the water by EOD divers (note that the munitions must be disposed of or disarmed in another way, exclusively by qualified underwater EOD/MCD)
- Depth measurements on land, wetland and in the water, such as points at which bombs are suspected in the riverbed
- Bomb/missile recovery with installation of supports
- Removal of submerged UXO (or suspicious objects) from navigable waterways using underwater munitions disposal procedures (UW UXO)



- Monitor the clearance process "QA" and carryout technical sampling procedures to ensure the quality has been maintain throughout the clearance process
- Clearance certificate and handover after operation

Expected experiences (informative):

- Underwater UXO or Mine Clearance Operations to meters depth in sediment, with water variation from 3 to 15 meters high (the working area is unique, with variable water depth ranging up to 13 m)
- Demining diving operations: target investigation, identification, neutralisation and UXO removal
- Underwater localisation & identification of UXO
- Technical Survey, detection and Data acquisition with DGPS positioning (map & cartography)
- Magnetic target positioning with diving investigation, identification & UXO collection
- Side Scan Sonar Survey and Data acquisition with DGPS positioning (map & cartography)
- Quality Assurance /Quality Control in Offshore and Onshore Mine Clearance Operations - ISO 9001/2000 Certification.

2.5 Accreditation and Licence

The Contractor shall obtain accreditation and licence(s) necessary for execution of all the Works in accordance with Serbian laws and standard, UN IMAS rules and International Standards for commercial diving & underwater operations.

The Contractor shall request these licenses and accreditation from the competent authority in Serbia and comply with the conditions put forward by the competent authorities.

Note that the UN IMAS Accreditation is obligatory (IMAS 07.30) and ISO 9001 Certification (such as "Quality Assurance /Quality Control in Offshore and Onshore Mine Clearance Operations - ISO 9001/2000 Certification" or similar) would be an asset for the Contractor.

2.6 Management of the Works - Certified and qualified Person

All works shall be managed according to the UN IMAS regulations, IMCA codes, International Standards for commercial diving & underwater operations, and other International and Serbian Standards.

Where such standards and codes are national, or relate to a particular country or region, other authoritative standards which ensure an equal or higher quality than the standards and codes specified will be accepted subject to the Supervisor's prior review and written approval. Differences between the standards specified and the proposed alternative standards must be fully described in writing by the Contractor and have to submit to the Supervisor at least 28 days prior to the date when the Contractor desires the Supervisor's approval. In the event the Supervisor determines that such proposed deviations do not ensure equal or higher quality, the Contractor shall comply with the standards specified in the documents.

A Contractor's Representative or a more Senior employee of the Contractor, as certified and qualified person (EOD level 4 – see appendix IX "Personnel qualifications"), shall manage the works on Site and keep the Site Diary. When this certified and qualified person is not present on Site during the works, a competent staff member appointed by the certified and qualified person shall be present instead of him and manage the works in accordance with the Contract and keep the Site Diary. This however, does not relieve the certified and qualified person from his responsibility for the management of the works on the site and keeping the Site Diary.

The Contractor's Representative will also be the contact person to the Supervisor and the point of contact to involved relevant and also influential authorities in any matter concerning the search areas, limitations in operation, external safety, transportation, storage, disposal, etc. Fluency in Serbian would be an asset for the Contractor's Representative.

2.7 Workmanship, Goods and Materials

All workmanship, goods and materials shall be to a standard as specified in these Technical Specifications. Where no description has been made in these Specifications, all workmanship, goods and material shall be in accordance with best practice for such workmanship and material, and to a standard not less than specified in the appropriate current Serbian standard, IMAS rules, International Standards for commercial diving & underwater operations and IMCA codes.



All goods and materials to be incorporated in the Works shall be unused, of the most recent or current models, and incorporate all recent improvements in design and materials unless provided otherwise in the Contract.

Wherever brand names are mentioned in the tender dossier, they shall serve as a quality reference only. Alternative brands of equal or higher quality than the specified reference brand will be accepted subject to the Supervisor's prior review and written approval.

A request for approval (including a comprehensive technical documentation and a full description of differences between the specified reference and the proposed alternative brand) must be provided in writing by the Contractor and submitted to the Supervisor at least 28 days prior to the date when the Contractor desires the Supervisor's approval. In the event the Supervisor determines that such proposed alternative brands do not ensure equal or higher quality, the Contractor shall provide the reference brand specified in the documents.

2.8 Tools and Equipment

All types of tools and equipment shall be to a standard as specified in these Specifications. Where no description has been made in these Specifications, all tools and equipment shall be to a best standard related to task, design and maintenance and shall be appropriate to current Serbian standard, UN IMAS rules and International Standards for commercial diving & underwater operations.

All tools and equipment have to be used properly and in accordance with the user manual or as approved by the competent authorities. All tools and equipment require up to data calibration reports to guarantee the functioning within the accuracy standard for this type of equipment and as required for these types of works and UXO activities.

After installation on site the Supervisor and MAC shall check the correct installation and function of the equipment in a test. The minutes of that test together with the results will be delivered to the Contractor and MAC. In case the results are not satisfying the contractor has to repair immediately the equipment or land the installation accordingly and the test has to be repeated.

Without approval of the Supervisor the use of equipment for survey, diving activities and recovery of UXO is not permitted. The handling and use of tools and equipment has to be described in the Method Statement.

Software solutions used by the Contractor for survey (land and underwater) must have a viewer enabling the Supervisor to check the results of the survey by his own. Special software solutions used by the Contractor must be demonstrated in its abilities and features. The delivered viewer must be accepted in its functionality by the Supervisor in writing.

2.9 Working hours

The anticipated working hours are eight hours a day, Monday to Friday. In case the contractor wants to deviate from these hours, he will request such deviation in writing, being subject to approval by the Supervisor. Any costs implications related to this deviation will be borne by the Contractor. EOD Team MUST work exclusively during the day (night works are forbidden).

2.10 Working simultaneously at various locations

The Project anticipates simultaneous execution of works at locations within land, wetland and underwater. Accordingly, the Contractor is expected to avail with several adequately equipped and qualified labour teams, capable of carrying out all the works at the required locations. Duration, chronological order and time dependence of works at different locations will be presented up to a standard acceptable and approved by the Supervisor.

2.11 Additional works in case of additional UXO (new underwater UXO finding)

It is possible that the contract of which these Technical Specifications form a part may, in appropriate circumstances, be modified to permit additional works and additional funding therefore. Any such modifications will only be permitted if they can be agreed before the expiry of the financing agreement under which the initial contract was financed and if the additional funding is available from the same budget line as that used for the initial contract.

In the event of encountering new sunken UXO, other than targets from SSS project 2008/09 that have to be removed, the Contractor shall inform the Supervisor immediately. On request of the Supervisor the Contractor shall prepare at his own costs a SOP and a Work Method Statement



together with the cost breakdown of the activities to be executed. The Contractor shall take into account all safety regulations and measures in accordance with international standards.

2.12 Partial provisional acceptance

Before Partial Provisional Acceptance the Contractor in co-operation with the Supervisor and Mine Action Centre, shall check finally that all documentation which has been requested and will be required for acceptance of the works, has in fact been presented and handed over to the Supervisor and to the MAC.

If requested by the Supervisor, the Contractor in connection with his notice for provisional acceptance shall submit a copy of the complete documentation present in his Control File and his Quality Manual.

The Contractor's remedial work after partial provisional acceptance (during the maintenance period) is subject to the same control conditions as the work before partial provisional acceptance.

2.13 Final acceptance

The Contractor will remedy any defects that will occur during the maintenance (defects liability) period, according to the stipulations in the Contract. The documentation related to any event occurred during the maintenance period of 365 days and to the Works and activities executed to remedy the defects, will be kept in the Contractor's Control File. The entire original documentation in the Contractor's Control File shall be kept with the Contractor for at least 5 years after the final acceptance, and will be accessible by the Supervisor or Contracting Authority at any given time, with prior notice.

The Contractor will provide the Mine Action Centre with an original copy of that documentation. This original documentation submitted by the Contractor will be kept permanently at the Mine Action Centre archive.



3 BACKGROUND INFORMATION

3.1 Beneficiary country

Republic of Serbia

3.2 Contracting Authority

EU Delegation (EUD) to the Republic of Serbia

3.3 Relevant country background

The Ministry of Infrastructure is the beneficiary of this project and is ultimately responsible for maintaining navigation through the work of Plovput, the Directorate for Inland Waterways.

The agency responsible for quality control of humanitarian demining, namely removal of unexploded ordnance (UXO) is the Mine Action Centre (MAC). MAC estimates that there are 43 locations that are suspected to contain 64 bombs and rockets; this includes the Danube and Sava rivers. There is over 16 million m² of land, river and embankment contaminated by cluster munitions that are off-limits, and around 2 million m² of the land contaminated with various types of antipersonnel and antitank mines.

3.4 Current state of affairs in the relevant sector

A comprehensive search and survey¹ of the Danube has logged the presence of UXO in eleven locations following land survey and water multi-beam scanning; a water magnetometer survey was carried out at all of these locations. This project focuses on the Prahovo Section (Danube, chainage km 858 to 859.2) where removal of UXO is hampered by the proximity of scuttled vessels from World War II (WWII, see Appendix II).

The SSS project identified some ±142 magnetic anomalies (see Appendix VI – List of D9 ferromagnetic anomalies) in the target area within the port; these lie at varying depths, although the majority (90%) lies between 0 and 5 metres below the floor of the riverbed. A schedule of depths is given in Appendix VI. In addition, a part of the target area was not surveyed.

The target area is complex, in part because the SSS project could not complete a magnetometer survey of the whole area and because it includes the Serbian fairway and anchorage. There are three problematic issues that will need to be addressed:

- The presence of WW II scuttled vessels that contain munitions believed to be depth charges (these lie within the previously survey area but were not surveyed);
- The Serbian channel / fairway / anchorage was not surveyed²; and
- The wharf / oil terminal, contains scuttled vessels or wrecks from WWII, whose cargo / munitions are unknown, was also not surveyed³.

There are at least four options to be considered in order to resolve these issues: (i) survey and leave alone, (ii) survey and remove UXO, (iii) do not survey and leave outside the work area, and (iv) survey, neutralise before remove UXO and salvage vessels.

Needs / Problems assessment for this project

¹ Two SSS projects were funded by the EC CARDS programme: *Supervision of Survey and Search Services for UXO removal in the Inland Waterway Transport System* (Contract No.05SER01/04/010) and *Survey and Search Services for UXO removal in the Inland Waterway Transport System* (Contract No.05SER01/04/011). They were completed in August 2009.

² The reason for this is unclear, but it was a unilateral decision made by the contractor and supervisor without input from MAC, the Port Authority or Plovput; possible reasons might have included depth of water, flow of water, difficulties with navigation, and impediment to normal port activities. It is therefore essential that MAC and the Port Authorities are consulted and briefed on a regular basis to avoid collusion between the contractor and supervisor.

³ This area was not surveyed; this may have been because (i) this is private property; (ii) water levels are low and don't permit normal methods of UXO survey [it is estimated that divers will be needed to survey this area], (iii) and the adjacent land is the responsibility of the Serbian Ministry of Defense. Both of these factors require contractors to follow strict procedures for acquiring work permits in the respective jurisdictions.



Preparations for the removal of UXO from the river bottom needs accurate information regarding the depth, dimensions and position of the targets; this data is needed to calculate the methodology to neutralise and remove UXO (with UXO identification by EOD, every fused UXO must be considered as non safe to move). Further data about the soil properties around the target locations needs to be collected, particularly to minimise any environmental contamination. A method such as CPT (cone penetration testing) measurement, using a specially adapted and non-magnetic CPT cone, has been suggested as an acceptable technique. This may be combined with other survey equipment such as electromagnetic induction, ground-penetrating radar, marine magnetometer, side scan and multi-beam sonar, remotely-operated vehicles and Scuba divers.

With such magnetic field measurements and subsequent modelling calculation of the dimensions of the target is possible. In the case of expensive underwater activities it is necessary to get a clear measurement of the dimensions of the target in order to be sure that only UXO are recovered rather than other objects such as scrap metal. The dimensions of the targets may be calculated with the results of borehole-georadar or marine magnetometer and if possible by EOD diver investigation for UXO identification.

It is strongly suggested to work with one or more of the following methods: Scuba diving (with EOD diver), multibeam, side-scan, sub-bottom profiler and to give preference to Caesium-Vapour-Magnetometer (marine magnetometer). For example, the model “G-882” (or similar) Cesium-Vapor Marine Magnetometer provides the same high performance and delivering high resolution results in all types of survey applications. This compact system designed for professional surveys in shallow or deep water is particularly well suited for the detection and mapping of all sizes of ferrous objects. This includes munitions and UXO of all sizes or other scattered shipwreck debris, and any other object with magnetic expression. The cesium-vapor marine magnetometer ensures that potential dangers can be accurately plotted and avoided or safely removed, effectively reducing; risk, delays and unnecessary costs.

The main needs/problems to be considered within this IPA 2010 project are the:

- Definition of the precise area, determination and inserting on the maps perimeters of the area for UXO removal in the Prahovo Section (*this will require a detailed survey to validate the location of the UXO, which will need to be signed-off by MAC / Mol / Plovput / Port Authority, with an appropriate permit and certification system*);
- Coordination with the authorities to ensure that work plans are agreed in advance, necessary permits are granted, and rules for navigation are agreed (*the work plan, which will need regular review and updating as necessary, must be agreed and signed-off by MAC / Mol / Plovput / Port Authority*);
- Identification of appropriate techniques and methodologies for the investigation, neutralisation and removal of UXO based on IMAS regulations and practical knowledge of STANAG 2884/AEODP-01(A) Vol 1 (*this will be developed into a works specification with appropriate permit and certification system, that will need to be signed-off by MAC and Supervisor*);
- All works for the UXO removal must conform to the Environmental Master Plan and Health & Safety Plan (*these will be developed into the works specification with appropriate permit and certification system, these will need to be signed-off by the Ministry of Environment and Spatial Planning*); and
- The contractor is obliged to handover the UXO, and any dredged material, for its safe transport and ultimate disposal to the appropriate authorities (*this will be developed into a set of procedures with appropriate permit and certification system that will need to be signed-off by the relevant authorities*).

The IWT Master Plan makes some observations on the care needed when conducting investigations and the removal of UXO from the Prahovo port (see Appendix II).

Plovput has conducted a bathymetric survey of the Danube; the field work has been completed and the data is being “cleaned”.



3.5 Related programmes and other donor activities:

A CARDS 2003 project⁴ financed the preparation of a Master Plan for the development of Inland Waterway transport. This plan includes the development of Prahovo port.

In 2008/9 the inland waterway was surveyed for unexploded ordnance (UXO) with a view to their eventual removal⁵. This was done in consultation with the Mine Action Centre and its findings are a benchmark for the proposed UXO removal and Supervision.

The Danube River Information System (RIS⁶) is being prepared for the Serbian reaches of the Danube; its remit includes her riparian borders. The Serbian RIS will be compatible with other RIS used in Hungary, Romania and Bulgaria. The full implementation of the RIS along the entire Danube is the subject of negotiations between the European Commission and the Danube Commission.

⁴ This information is supplemented by the EU funded Feasibility Studies for the Serbian IWT Network and for the IWT Ports (2003 CARDS contract No. EAR/03SER01/08/002).

⁵ 2005 CARDS programme contracts Nos.05SER01/04/011 and 05SER01/04/012

⁶ An IPA 2007 project



4 OBJECTIVE, PURPOSE & EXPECTED RESULTS

4.1 Overall objective

The overall objective of this project is to “develop the full potential and the competitiveness of Serbia's inland waterway transport sector for socio-economic development, in particular in the Danube basin” (see fiche Logframe in Appendix I).⁷

More accurately, this specification is for a works contract in full accordance with EU, international and national standards.

4.2 Purpose

This project's purpose is “to remove identified UXOs within the most priority areas⁷ and conduct an efficient and effective supervision of their removal from the navigation fairway in accordance with international regulations and standards” (see fiche Logframe in Appendix I).

Specifically, this project's purpose is to clear suspicious ferromagnetic objects⁸ from the Danube riverbed at Prahovo port; these anomalies have been tentatively identified as unexploded ordnance (UXO) or wrecks (sunken vessels⁹) from the World War II containing UXO. The Contractor must ensure that these suspicious anomalies are investigated more closely by EOD diver; and after further investigation such objects that are suspected, with a high degree of probability to be UXO, should be neutralised, removed and disposed of.

The technologies currently employed by munitions response industry are:

1. Archive Search
2. Site Investigation
3. Detection
4. Access, Location and Excavation
5. Deactivation/Neutralization (hand tools, explosives disrupters, special shaped charge, dearmers, tape & line, rocket wrench, abrasive cutting equipment...)
6. Recovery & underwater recovery
7. Disposal
8. Monitoring and Stewardship

4.3 Results to be achieved

This project requires the following inter-related outputs (see fiche Logframe in Appendix I); however, the first result is especially pertinent:

- Navigation conditions in the Prahovo port along Corridor VII are in line with the Danube Commission's requirements and international standards.
- Supervision of UXO removal activities in accordance with national and professional standards have been carried out successfully.

⁷ The provisional area is around the port of Prahovo; the exact area(s) will be selected following consultation between the Mine Action Centre, Plovput and the Ministry of Infrastructure (Plovput and the Port Authority). The chosen location(s) will be verified at the start of this Project. There are other interested parties, which include: the Russian owners of the oil terminal, the Ministry of Defence who are responsible for part of the littoral adjacent to the terminal and Port, and the owners of the Port.

⁸ These anomalies arise largely from the 1999 NATO air operation campaign, although there are also suspected to be UXO from World War II.

⁹ These wrecks (sunken vessels) containing UXO will not be removed under this project, but the Contractor will insert their positions in the maps. However, Contractor is obliged to remove all isolate UXO that can be possibly detected outside these vessels.



5 ASSUMPTIONS AND RISKS

5.1 Assumptions

There are no specific assumptions underlying the successful implementation of this project set out in project fiche's Logframe (see Appendix I). However, it is assumed that the Supervision and UXO removal can be coordinated effectively and that access to Prahovo port is made available. This requires careful planning and coordination, which must be done in detailed consultation with the Port Authorities, MAC and the owners of any of the land based facilities in the search and recovery area. Specifically the additional assumptions are that:

- Existing legislation and regulations are sufficiently clear to allow the commissioning and acceptance of the activities by the potential Contractors;
- The Contractor will obtain the required permits in timely fashion with the full support of the local authorities; and
- Strong political will and commitment exist that will ensure that the local authorities and institutes will facilitate the smooth implementation of the project.

5.2 Risks

There are no specific risks identified in the log-frame that is part of the project fiche; however, it is clear that there are risks associated with this project. These include:

- Survey and removal works are hampered by the Sturgeon spawning season or other environmental restrictions;
- Unfavourable weather and river conditions hinder UXO neutralisation and removal;
- Agreement over the extent of the removal area not finalised; this will be finalised before the commencement of works together with the Ministry of Infrastructure, Mine Action Centre, Supervisor and Contractor;
- Permits and approvals are not provided in a timely fashion due to administrative restrictions; and
- Continued co-operation from neighbouring states in respect of navigation (i.e. Romania).

Clearly this is a hazardous project, with inherent risks from both the UXO and navigation in busy channel and port. To minimise the administrative risks mentioned above an indicative inventory of the applicable permits and accreditations is given in Appendix III.



6 SCOPE OF THE WORK (FOR INDEFINITE QUANTITY OF UXO)

6.1 General

6.1.1 Project description

This project covers the survey and removal of unexploded ordnance (UXO) from the Prahovo Section (Danube, chainage km 858 to 859.2 – land, wetland/river bank and underwater/riverbed) in Serbia.

A budget has been set aside for the land, wetland and underwater survey and removal of UXO, including the general survey for the roads access and areas (tracks, base camp, workplace, etc.) for cluster-bombs clearance all around the site between riverbanks and land. These access roads, tracks, and all areas cleared will be marked with plastic bags and maintained in perfect conditions.

A separate project has been allocated to Supervision of works.

Both projects are funded from the IPA 2010 programme.

FORWARNING:

The UXO water Survey identified ± 142 targets which magnetic response could potentially be linked to munitions. The NATO air force attacked a number of targets on the river bank and at the port, using MK 81-84, BLU-109, GBU 27-28 and cassette bombs, with various guidance systems and various types of rocket weapons including the cruise missiles.

Thus, the risk of encountering an Unexploded Explosive Ordnance (UXO) is low. In reference to the pre-existing documentation: “on the basis of ballistic estimates, experience, observations and number of missiles which might not have exploded (especially those that hit the water), it is expected that this location may contain two (2) UXO in the riverbed and port”. An appropriate number (at least 5) of UXOs must be removed according to the instructions given by the Supervisor and MAC.

Appendix IV provides more details about the location of the project and the conditions there.

6.1.2 Geographical area to be covered

Prahovo Section on the River Danube in the Republic of Serbia.

6.1.3 Target groups

The target groups for this project are:

- The Mine Action Centre, who provide oversight for the removal of UXO in Serbia;
- Plovput, the Directorate for Inland Waterways who are responsible for navigation along the Danube; and
- Ministry of Infrastructure (Mol), who is the formal beneficiary of the project, and their Sector for water traffic and security of sailing (Kapetanija in Prahovo).

Their contact details are:

Mine Action Centre: Vojvode Toze 31, 11050 Belgrade, tel: +381 11 30 45 280, fax: +381 11 30 45 281

Plovput: Francuska 9, 11000 Belgrade, tel: +381 11 3029 801, fax: +381 11 3029 808

The Ministry of Infrastructure: Nemanjina 22-24, 11000 Beograd, tel: +381 11 363 1616, fax: +381 11 361 7486

Kapetanija (Mol), Port Headquarters, Prahovo: Pristanišna zona bb, 19330 Prahovo, tel/fax: +381 19 524 026



6.2 Specific activities

The survey and removal team will work closely with all parties, so transferring to them both technical knowledge and skills associated with this project.

The Contractor's team should carry out any necessary investigations, surveys and tests in order to validate the location of the UXO removal. These surveys/tests should include, but may not be limited to: Scuba diving investigation, bathymetry, physical-chemical analysis of sediments and riverbed material, geotechnical and hydraulic modelling. Techniques using electromagnetic induction, ground-penetrating radar, marine magnetometer, side scan and multi-beam sonar, remotely-operated vehicles and Scuba divers may also be appropriate.

If such studies are required to delimit the area of operations in Prahovo port, then they are to be supervised by this project.

6.3 UXO survey and removal works

These works provided by the Contractor should include, but not be limited to, the following subsections, where the Contractor shall:

- (i) Conduct a detailed survey of the specified area, which should include all of the anomalies identified in previous project "SSS 2008/09". This must be done to determine the exact and extent of the anomalies and their location, thus confirming, or otherwise, as an object identified UXO for removal.¹⁰
- (ii) Prepare work plans, Standard Operating Procedures (according to UN IMAS), for the UXO's removal;
- (iii) Remove the UXO (after neutralisation or render safe), taking due care in setting out and preparing for the extraction of the objects;
- (iv) Dispose of the UXO using approved local contractors and according to international and national standards. The approved and designated site for destruction in this region is the approved polygon at "Petrovo Selo" village that meets all the requirements and contains all that is necessary for such works at a distance of about 48 km away from Prahovo. (UXO destruction on site may be only exceptional, supported by a special permit, in case this proves to be the only safe manner of removal)
- (v) All sediment and river material excavated in the course of the object's removal shall be disposed of in accordance with the Environmental Management Plan, subject to the appropriate permits.

The clearance method contains the stages of underwater UXO locating, search and diving identification, uncovering, de-activation & neutralisation, excavation and extraction, transport and destruction of UXO.

6.4 Project management

6.4.1 Responsible body

European Union Delegation (EUD) to the Republic of Serbia.

6.4.2 Management structure

The Programme Manager for Operation in the EU Delegation will supervise and monitor the implementation of the contract.

The Contractor's primary counterpart will be the Ministry of Infrastructures and MAC, the former will appoint a Responsible Person to undertake operational project management and liaison with the Port Authority. Representatives of the Port Authority work split shifts (five days on - five days off), so meetings must be carefully scheduled.

¹⁰ An appropriate number (at least 5) of UXOs must be removed according to the instructions given by the Supervisor and MAC. Criteria for selection of UXOs that are going to be removed and disposed will be defined by MAC in collaboration with Supervisor.



The Responsible Person will coordinate project implementation and shall ensure that all staff of the beneficiary organisations provide such assistance and information as may be necessary to ensure the successful implementation of the project.

MAC will appoint a Project Manager, who will be responsible for day-to-day liaison and coordination with the project team.

6.4.3 Facilities to be provided by the Contracting Authority and/or other parties

Neither the Contracting Authority nor MAC are obliged to provide facilities. Nor is the Port Authority obliged to provide support but they have agreed to do so. The Port Authority will assist the contractor in finding a suitable facility that they may rent, or permit the Contractor to erect a temporary container office on the port authority's premises. EUD/MAC shall provide the Contractor with all relevant reports, studies, legislation, standards, methodologies and other technical documentation required for the completion of the required results, without charge or unreasonable delay.

The OCF must be adjacent to the Danube and the target area; ideally it should be a secure compound, where both the Contractor and Supervising Consultant can secure their equipment and be close to the temporary wharf / jetties needed for the survey and recovery.

6.4.4 Training

MAC's supervisory role is critical to the future clearance of the Danube river; it has a small permanent staff (nine persons) with another four persons (surveyors and topographers) provided by Donors. The training provided by this project should supplement the capacity building carried out by other Donors.

A training needs analysis should be carried out, with specific focus on future UXO clearance. It should comprise of on-the-job training, but it must not hinder MAC's day-to-day activities.



7 EXECUTION OF FIELD WORKS

7.1 Preparation works

7.1.1 Standards for UXO and underwater diving operations

Clearance will be executed according to international standards (IMAS, UN Accreditation, ISO 9001 Certification, practical knowledge of STANAG 2884/AEODP-01(A) Vol 1) and in compliance with requirements of International Standards for Commercial Diving and Underwater Operations, and of the Danube Convention and the Protocol on Safe Navigation.

The workplaces (land/wetland and underwater), the site installation and all equipment used by the Contractor, must be comply with the appropriate international and national standards; specifically they must comply with the following directives of the EU and/or the according laws of the member states:

- ✓ Directive 2001/95/ECC Product safety
- ✓ Directive 89/391 +392/ECC; 98/37/EG Safety and health requirements of workers at work
- ✓ Directive B9/654/ECC;92/57 +5B/EWG; 90/270/EWG; Safety and health for the use of workplaces
- ✓ Directive 89/6551ECC Safety and health for the use of work equipment by workers at work
- ✓ Directive 89/656/ and 89/686/ECC Safety and health on the use by workers of personal protective equipment

The Contractor must instruct his staff accordingly and use only equipment and tools compliant with these regulations. In case of discrepancies between the Serbian law and the EU-Legislation, the EU shall prevail.

In particular during and following exposure and handling of UXO (Unexploded Ordnance Devices), ERW (explosive remnants of war) and mines, the International Mine Action Standards (IMAS¹¹) health and safety precautions must be followed. The pertinent IMAS-Regulations are:

<http://www.mineactionstandards.org/imas.htm#english>

- ✓ IMAS 07.30 Accreditation of Demining Organisations (Ed.2) Amendments 1, 2, 3 & 4
- ✓ IMAS 09.30 Explosive Ordnance Disposal (Ed. 2) Amendment 1
- ✓ IMAS 10.10 S&OH General Principles (Ed. 1) Amendments 1, 2 & 3
- ✓ IMAS 10.20 Demining Worksite Safety (Ed. 1) Amendments 1, 2, 3 & 4
- ✓ IMAS 10.30 Personal Protection Equipment (Ed. 2) Amendment 1
- ✓ IMAS 10.40 Medical Support to Demining and UXO-service Operations (Ed. 1) Amendments 1, 2 & 3
- ✓ IMAS 10.50 S&OH Storage. Transportation and Handling of Explosives (Ed. 2) Amendments 1, 2, 3 & 4
- ✓ IMAS 10.60 S&OH Reporting and Investigation of Demining and UXO-service Incidents (Ed. 1) Amendments 1, 2, 3 & 4
- ✓ IMAS 10.70 Safety & Occupational Health - Protection of the Environment (Ed 1.) Amendment 1

The United Nations has created Mines Action Standards which sets out how clearance operations should be carried out in humanitarian demining; the document clearly states how quality assurance and control is to be carried out. This document is written to comply with International Standard Organisation "ISO" requirements.

The methodology contained in the Contractor's proposal must stipulate the range and scope of the individual SOP's; these must comply with the above directives, standards and regulations.

¹¹ The IMAS regulations may be found at: <http://www.mineactionstandards.org/imas.htm>



7.1.2 Obtaining Permits

The Contractor will be responsible to obtain the necessary permits to execute and during the execution of the works and for detailed designs. Before executing any works and as required or indicated by the Supervisor the Contractor will have to submit copies of the requests for approval of the designs and of the permits received. The Contractor will prepare these designs using standards acceptable to the Supervisor and in such a detail and quality to obtain the approval of the competent authorities. The Contractor is responsible for and will have to obtain the necessary approvals during the various stages of the execution of the works taking into account the procedures and methods.

7.1.3 Standard Operating Procedures (SOP)

A series of Standard Operating Procedures (SOP) must be established and agreed in accordance with the IMAS 07.30.

These will cover UXO operations and EOD methods, health & safety, installation facilities, surveys, detection methods, Quality Assurance and Control (such as “QA/QC in Offshore and Onshore Mine Clearance Operations - ISO 9001/2000 Certification” or similar would be an asset for the Contractor), recovery & disposal, and all underwater operations. The SOPs must contain any and all procedures related to UXO detection & removal (land and underwater), safety distances, as well as public information and notification of authorities.

The draft detailed SOP together with the Method Statements that have to be submitted with the Tender shall cover the requirements hereafter.

The EOD methods with EOD neutralisation are used before to remove the UXO from the bottom (hand tools, low-level detonation method as: explosives disrupters, special shaped, dearmers, rocket wrench/fuse extractor, tape & line, etc.), or using abrasive cutting equipment such as HP water jet cutting.

Guidelines for these SOPs are given in the following sections. The Contractor tendering for these works shall consider these to be the bare minimum standards and must interpret them appropriately when preparing their technical proposal.

Updating SOP: upon locating of an UXO the Standard Operating Procedures which the Contractor has submitted with his bid need to be adjusted to the local circumstances. The protocol for operating these procedures must be agreed and signed-off prior to work commencing; this should also include the issuance of the appropriate permits and certificates.

The Contractor shall submit the final and detailed (full) SOP fifteen (15) days before commencement of the works for the Approval of the Supervisor, the Contracting Authority and the Mine Action Center.

7.2 Surveying

7.2.1 Existing levels

The Contractor shall satisfy himself that the existing ground and riverbed levels as shown on the drawings in Volume 5 are correct. Should the Contractor wish to dispute any levels, prior to the execution of the survey, he shall submit to the Supervisor a schedule of the position of the levels considered being in error and a set of revised levels. The existing ground relevant to the disputed levels shall not be disturbed before the Supervisor’s decision as to the correct levels is given.

7.2.2 Sequencing of activities

During the 2008/9 survey over ± 142 anomalies were detected (see appendix VI); these are assumed to be UXO and embedded in the riverbed up to a depth of about 6 m. The position and identification of these suspects UXO should be verified with the following methods: multibeam, Side-Scan, Sub-Bottom profiler and Caesium-Vapour-Magnetometer. The results of the survey will be made available to the contractor.

It is strongly suggested to work with one or more of the following methods: Scuba diving (with only EOD diver), multibeam, side-scan, sub-bottom profiler and to give preference to Caesium-Vapour-Magnetometer (marine magnetometer). This compact system designed for professional



surveys in shallow or deep water is particularly well suited for the detection and mapping of all sizes of ferrous objects. This includes munitions and UXO of all sizes or other scattered shipwreck debris, and any other object with magnetic expression. The cesium-vapor marine magnetometer ensures that potential dangers can be accurately plotted and avoided or safely removed, effectively reducing; risk, delays and unnecessary cost.

It has to be stated that all the above results are describing geophysical anomalies not real objects. A field can be created by several objects so that an anomaly can indeed consist of more than one object. An anomaly is regarded as cleared in case that all small objects are removed and the result is controlled by a magnetometer.

According to the error assessment applied to the surface measurements conducted during the 2008/9 survey accuracy of the position of the suspicious objects is within a threshold of about plus/minus 1 m. Due to these restrictions the accurate depth and the dimensions of these items are not sufficiently known, further variations in detection tolerances mean that there other unknowns:

- ✓ Probability that the items are UXO;
- ✓ Typology of UXO;
- ✓ Position and depth of the objects in order to place the underwater protective device correctly.
- ✓ The preparation for the recovery of UXO from between 1.5 to 2 m below the riverbed needs accurate information regarding depth, the dimensions and the position of the targets and the soil conditions especially to calculate the underwater protective device (protective screen for current/baffle for fluids, rings etc.).

With the measurements the position and depth of the objects together with its dimensions are measured as precondition for safe and successful recovery of it, and systematically after underwater UXO neutralisation (such as defused or other EOD methodology). If it becomes clear after data processing, that the investigated object is with high probability an UXO, the method statement for recovery must be prepared (completed by Scuba diving identification with EOD diver before UXO removal). In case of the object is embedded more than 1.5 m in the riverbed additional foundation analysis of the soil conditions on site must be investigated in order to prepare the decision how the stiffening of the building pitch can be performed.

After recovery of all small objects another QA area survey has to be carried out to control the result of the recover and to ensure that all suspicious small objects are removed from the riverbed. The other buried metal object will be marked "FFE" (Free From Explosive: signifies items made inert and/or confirmed to contain no presence of explosives).

The magnetic surface survey is intended to be performed under three circumstances:

1. Areas not been surveyed in the previous contract 2008/2009 must be surveyed
2. Spots with insufficient information received with the previous survey must be resurveyed in order to get more precise information
3. After recovery of the UXO the area where the items had been recovered must be resurveyed again in order to proof the accurate performance and to check if all parts suspicious to be UXO are recovered.

7.2.3 Verification survey

An accurate ground survey of all coordinates and perimeters is precondition for successful performance. Failures during the survey may lead to unsuccessful and unsafe recovery activities; consequently any claims for payment will be void.

The Contractor shall make sure that the existing ground and riverbed levels as described are according to the actual situation during his work and basic of accordant payment. The coordinates of the turning points of the areas to be searched shall be determined in the drawings and borders of those areas shall be mapped. Should the Contractor wish to dispute any levels, prior to the execution of the survey he shall submit a schedule of the position of the levels considered being not accordant to the drawings and the descriptions of the tender documentation and deliver a set of revised levels to the Supervisor. The existing ground relevant to the disputed levels shall not be disturbed before the Supervisor's decision as to the correct levels is given.



This level will be defined as the performance benchmark and payment for works rendered must be based up joint agreement of the measurement.

The Contractor shall generate the digital maps through a detailed survey using the integrated GPS system. In case of insufficient DGPS reception the geodetic reference has to be transferred via optical means. Digital results must be transferred to the Supervisor as ASCII-codes.

The input data for digital topographic maps of the area shall be collected by the Contractor using a precise electronic tachometry method. The survey must be conducted by suitable qualified personnel.

If during the performance ground or riverbed levels are change, the Contractor must apply for approval of those revised levels to the Supervisor, otherwise the joint agreement of the levels at the beginning of the performance is the benchmark for payment claims.

Therefore, maps of the UXO-suspicious points and areas have to be mapped and marked during survey and recovery activities according to this system.

The accuracy of the perimeters of the areas must be within ± 0.1 m.

Positions and perimeters on the riverbed have to be transferred with adequate methods to the water surface. The method used by the Contractor has to be described in the Technical Offer.

The Supervisor may at his own discretion check the Contractor's surveys and setting-outs, and perform his own surveys for inspection and check of the Contractor's measurements for payment. The Contractor shall provide the Supervisor with all reasonable and customary practical assistance for performing such surveys and measurement, including labour (chainmen), minor consumables (such as pegs), floating equipment, etc.

The results are part of the UXO survey has to deliver a declaration (clearance certificate/hand-over certificate...) that the whole area inspected after recovery of UXO is free of any objects suspicious to be a 500 lbs bomb or larger UXO. This declaration must be signed by the responsible project manager and the business manager of the Contractor. The criteria and thresholds to assess suspicious objects and to include or exclude it for consideration must be explained by contractor in the Technical Offer.

7.3 Searching for UXO

7.3.1 Search equipment

The Contractor shall perform the UXO search on the land and water area through the application of several methods using the Geophysical Information Systems (GPIS) as its basis. The Contractor will collect data and execute the required geodetic surveys, physical field visits and prepare 2D and 3D maps and images of the land and water area subject to the search, making use of geophysical measurement methods (geomagnetic) and use of proton magnetometers and sounders.

The Contractor will ensure that any measurements, including the geomagnetic measurements to be carried out shall accurately define the geo-referent coordinates of points with recorded anomalies in the values of geomagnetic, electromagnetic and other physical fields intensities, identifying through this manner the locations contaminated by ferromagnetic and other materials, including UXO.

The Contractor shall perform search of the area with the metal detectors for landmine detection and active detectors for buried ammunition (using devices like metal detector UPEX 740M, passive detector such as borehole/Magnex 120LW, or similar).

The Contractor shall perform search of the area possibly contaminated with cluster bombs with the bomb locators for battle area clearance.

The Contractor has to submit up-to date calibration records of the equipment to be used for the surveys. These records have to be approved by the Supervisor prior to the use of the same. Suitable instruments to execute these measurements may include proton magnetometers with dragging sounders capable of rough signal selection and high quality anti-mine sounders. The Contractor shall perform UXO detection using precise detectors – bomb blockers.



For wetland and riverbed EOD diver can use underwater ammunition detection (using devices like metal detector UWEX 722C or UWEX 725K, passive detector such as borehole/Magnex 130B, or similar).

7.3.2 Search Method

The Contractor shall make himself familiar with experiences gained so far in the Danube river UXO clearing projects and of experiences with similar river or sea conditions.

The Contractor shall prepare and submit a Method Statement of the search for UXO, including cluster bombs and land mines. This Method Statement will include amongst other the equipment to be used for search, taking into account the type of UXO and local conditions.

The Contractor will make use of geomagnetic measurements with the application of contemporary technologies of detection-measurement and for positioning.

Above mentioned geomagnetic measurements could not be used for the demining – clearing of the areas contaminated with AP and AT land mines and cluster bombs. For the carrying out of those operations Standard Operating Procedures for demining of the mine fields and Standard Operating Procedures for battle area clearance should be used.

The Contractor will carry out measurements to be performed on parallel lines of approximately the same depth, along the river course, using intensity and a frequency to obtain a 100% coverage and to ensure that no area shall be missed in the search. The Contractor shall apply a methodology that will provide digital records of areas to be searched, guaranteeing full reliability of the search.

Requirements for the positioning system will be according to the International Standards for these types of works and a Work Method Statement will be submitted by the Contractor for approval by the Supervisor.

The Contractor shall determine at all the positions with identified magnetic field deviations, the coordinates in WGS and local coordinate system. These will be used for guidance of vessels with marking and other equipment and for EOD divers who further search the locations for identified magnetic field anomalies.

The Contractor will mark the points of defined magnetic field deviations. The measurements shall be subject to analysis and the bomb-detonation team and divers will be informed accordingly. The analysis of collected data shall result in an answer to the question of the presence of ferromagnetic matters of defined values, as an equivalent to a possible UXO with accurately defined coordinates and depth.

The analysis of collected data and the identification of the possible locations where UXO seem to be present need to be confirmed by the Supervisor before the Contractor continues the following steps of the removal works.

7.3.3 Positioning Method

The Contractor shall prepare and submit a Method Statement describing the positioning method and the equipment and materials to be used and the means to keep remotely operated equipment on track, including the geographical reference, and how to position finds of ordnance on the riverbed and on riverbanks, or land and wetland area.

7.3.4 Detection Method

In a first step a land/wetland survey with a DGPS system is needed to determine the perimeters of the areas with the suspicious objects and the areas still not surveyed.

The detection of UXO buried in the banks or the riverbed at greater than 2 m becomes inaccurate and ineffective with increasing depth due to signal weakness and interference.

During the 2008/9 survey which prepared for the possible recovery of suspicious objects it was recognised measuring criteria had to be improved, particularly regarding:

- ✓ Position of the object;
- ✓ Its size; and
- ✓ Its dimensions.

The Contractor should consider the following possibilities (for land or underwater operation):



- ✓ Drilling and jetting of holes up to 6 m into the riverbed with water depths up to 15 m above.
- ✓ Magnetic borehole detection with 3-axis-magnetometer with a measurement range of more than ± 150.000 nT.
- ✓ Borehole geo-radar in reflection mode with a frequency of 100-500 MHz or as appropriate.
- ✓ Use of a method for investigation of soil conditions without impacts caused by shock or vibration of the tools like CPT (Cone Penetration Test) or similar

7.3.5 Riverbed Detection Method

The Contractor will carry out magnetic field measurements to be performed on parallel lines of approximately the same line spacing of less than or equal to 2 m along the river. If the line spacing exceeds that distance those lines have to be resurveyed or overlapping can be used to perform the survey with the Hypac software or similar.

One day after survey the contractor has to deliver the track plan of survey to the Supervisor for consideration.

The data acquisition has to be performed with Caesium-Vapour- Magnetometers (such as G 882 model or similar) with Maglog software and Hypac to navigate with precision.

The Contractor shall apply a methodology that will provide digital records of the areas to be searched, guaranteeing full reliability of the search.

The Contractor has to use a DGPS RTK-system with a GPS-Base station on land (such as DGPS Trimble 5700 or similar). The data have to be time stamped and synchronized with the GPS position. If the GPS connection is insufficient the position should be transmitted via optical means (tachymeter-total-station). The Contractor shall determine at all the positions with identified magnetic field deviations the coordinates in WGS and Gauss-Krueger System Bessel Ellipsoid 1841.

Along the track of the sensor or the sensor platform is moved the data point interval of readings should be minimum 5 readings per meter.

A hardware setup with a real time control of the sensors height above the riverbed has to be used. With angle sensors the position of the probe on the ground relative to the GPS-Antenna has to be recorded continuously. The distance of the sensor to the riverbed should not exceed 0.5 m. The altitude of the sensor above the riverbed must be recorded and provided for control of the Supervisor with an echo sounder.

The variations of the earth magnetic field have to be recorded with a base station on the survey vessel. It is recommended using an array with additional vertical sensors (0.5m- 1m vertical separation). Such a setup would yield total field as well as real vertical difference information. With that solution the problems of data underneath of ferromagnetic disturbances as well as false alarms created by ship traffic could be eliminated.

The preliminary data control must be performed in real time and made available to the Supervisor within 1 day after survey.

The methods used for data acquisition must be described in the Technical proposal. The approval of the Method Statement is precondition for the performance of the contractor.

If the contractor on his own decision starts his survey on another site without approval of the data by the Supervisor any costs resulting from this decision are born by the contractor.

7.3.6 Data processing QA/QC

The magnetic measurements shall be subject to data processing and analysis of the field deviations. The accuracy of the results of survey has to be as follows:

- ✓ X and Y equal to or better than 0.5 metre
- ✓ Z equal to or better than 0.15 metre

The analysis of collected data shall result in an answer to the question of the presence of ferromagnetic matters of defined values, as an equivalent to a possible UXO with accurately defined co-ordinates and depth.

In a method statement delivered with the offer the contractor have to describe:

- ✓ the magnetic software he is using,



- ✓ its possibilities of data processing,
- ✓ the model assumptions used in the software
- ✓ the specific filter functions
- ✓ the viewer to reads the results of data processing delivered to the employer

The analysis of collected data and the identification of the potential locations where UXO may be present will be done by the Contractor and its experts guided by the Supervisor.

The complete results of data processing have to be processed and delivered for approval of the Supervisor in due time, latest 6 days after the date of the survey.

The identified magnetic fields must be described in a list of results. The Supervisor has 3 working days time available for approval of the data, which is precondition for moving the survey crew to the next site.

The Contractor has to provide the Supervisor with a viewer enabling the reading of the magnetic data.

7.3.7 Preparation of boreholes

The boreholes for the magnetic and georadar measurements must be created without creating impact by shock and vibration; suitable techniques might be drilling or jetting with a water beam.

In the Technical Proposal the Contractor has to describe his proposed method for sinking the boreholes together with a table of his technical equipment used for that purpose. Furthermore the contractor has to explain his precautions to exclude any possible ignition of the fuse during the process.

7.3.8 Magnetic detection

Three-axis magnetometers are more versatile than the single-axis versions. Essentially consisting of three single-axis sensors, in an orthogonal configuration, they measure magnetic field strength in the x, y and z directions. This allows the total magnitude and direction of a magnetic field to be determined. The typical measurement range is up to 200,000 nT which enables an interpretation of measurements even in vicinity of big ferromagnetic objects. Therefore, for performing this project the contractor should use probes with a dynamic range of minimum $\pm 150,000$ nT.

The purpose of borehole detection is the detailed investigation of the disturbances of the earth magnetic field caused by the chosen ferromagnetic objects in order to find its exact position in the ground. The exact x, y-position of the borehole has to be recorded in writing an inserted into a site drawing.

The contractor must use probes with digital recording with the possibility of printing of a profile chart of the results. Furthermore, the following measurements are required:

- ✓ The coordinates of the measurements must be plotted in the drawing of the whole area in appropriate scale,
- ✓ The functionality of the probes must be tested every day and recorded in the site diary,
- ✓ The depth of the probe must be continuously electronically recorded,
- ✓ The digital data have to be delivered to the supervisor daily
- ✓ Data point distance is ≤ 0.05 m
- ✓ Allocation of the midpoint of the anomaly ≤ 0.1 m.

In case of expensive deep building activities it is necessary to get a clear measurement of the dimensions of the target in order to be sure that these efforts are done to recover UXO rather than anything else like scrap metal. This decision can be taken only following measurements of the dimensions of the suspicious object.

Borehole-radar reflection methods provide information on the location, orientation, and lateral extent of objects that in vicinity of the borehole. With the borehole detection the dimensions of the object should be determine if the objects might be an UXO or not.

The technical requirements for borehole radar are:

- ✓ Centre frequency: 100-500 MHz, or as appropriate
- ✓ Digital record of depth and results

The results have to be made available to the supervisor on daily basis in order to decide according to further proceedings with the object in question.



7.4 Locating UXO

7.4.1 Updated SOP

Upon locating and identification of an UXO, for each location, the Standard Operation Procedures which the Contractor has submitted with his bid, need to be adjusted to the local circumstances.

The Contractor shall submit the final and detailed (full) SOP fifteen (15) days before commencement of the works for the approval of the Supervisor, the Contracting Authority and the Mine Action Center.

7.4.2 Detailed Work Method Statement

Upon locating and identification of an UXO and after adjusting the SOP to the local circumstances, the following has to be recorded and prepared, all to the approval of the Supervisor and MAC:

- ✓ Record of position
- ✓ Record of type and fusing (if possible)
- ✓ Record of uncovering activities
- ✓ Record of state including hazard evaluation
- ✓ Plan for neutralisation and removal based on the updated SOP.
- ✓ Plan for transport and disposal based on the updated SOP.
- ✓ Special Safety Program (including barrier, accident response and evacuation) based on the updated SOPs to prevent any damages to the public and to environment in case of an accidental detonation of the bomb.
- ✓ Transport to the demolition area appointed by the Mine Action Centre Serbia (currently at Petrovo Selo, which is about 48 km away from Prahovo in the North part)
- ✓ Disposal of ordnance
- ✓ Record of disposal and demolition (time, position and type, etc.)

This has to be done in due time and decided together with the Supervisor and the Mine Action Centre. All above mentioned aspects will be included in a detailed Work Method Statement, taking into account the health and safety precautions. The Contractor will further include drawings and descriptions of the sections of the site and other working areas including: access roads, traffic regulation on-and off shore, temporary piers and quays, barges, tugboats, cranes and lifting equipment, containers for personnel, material, tools, waste etc.

The Detailed Work Method Statement shall be submitted fifteen (15) days before commencement of works on site for the approval of the Supervisor, Mine Action Center and the relevant authorities.

The specified Method Statement has to be delivered as soon as possible latest 2 days after finding of the UXO.

In water the building pitch has to be stiffened and sheltered as long as the decision making process is ongoing in order that the UXO is not moved by the current and that the pitch is not silted up completely by sediment during the idle time. The method preferred by the Contractor has to be described in the Method Statement delivered with the offer.

The site has to be marked with yellow buoys according to the site specified Traffic Safety Plan agreed with the site captain and endorsed by the Supervisor.

All activities have to be agreed with the local authorities and the site Captain who will inform the navigation authority according, to the Traffic Safety Plan.

After decision of the Contractor together with the Supervisor and MAC the agreed procedure can start. Every step of disposal and demolition (time, action, position of the UXO etc) has to be accurately recorded.

7.5 Uncovering

UXO uncovering at the river bottom shall be performed by the Contractor depending on the location of the target, type of bottom and soil and prevailing environmental conditions using the required equipment to uncover the item. Once the uncovering operation has started the



Contractor should complete it, to prevent the subject from being covered again after some idle time due to sediment transport of the river.

7.6 Investigation and Identification

Once UXO re-acquired, the Contractor shall proceed of the investigation (land and underwater) and identification of the anomalies.

During intrusive investigation, the Contractor shall maintain an exclusion zone. This exclusion zone shall be corresponding to the biggest calibre likely to be found.

The Contractor may need to move the marker during investigation work. If this occurs, the Contractor shall maintain at the work site a centimetre GPS in order to re-position the marker afterward.

The Contractor must investigate each anomaly, at a depth of investigation of 6 m below sediment surface.

If the anomaly is found within the 2 m depth, the Contractor must excavate the item in order to identify it (non munitions debris, munitions debris, UXO...). The Contractor shall continue the detection to make certain that no other item is still present at this location.

If the anomaly is found to be deeper than the 6 m depth, the investigation is over. In this case, the Contractor shall inform the Supervisor immediately to confirm that with the collected information there is no possibility to be an UXO.

The hole created by the excavation work must be kept in place until the Supervisor will have verified the excavation.

It is likely that an anomaly may have been created by more than one item. In such situation, the Contractor must investigate and identify each item creating the anomaly.

If more than one item is identified within the 2 m radius, the Contractor shall fill the table of anomaly identification for every item.

The Contractor must take picture of each anomaly/item and include those pictures in the daily reports and the final report. A submersible camera will be required for UXO not safe to move (it depends of the visibility).

The following information must be written on a board/paper next to the anomaly before taking the picture and a ruler (cm) shall be used in order to provide information relative to item dimension:

- ✓ Project number
- ✓ Contract number
- ✓ Anomaly identification number
- ✓ Water depth
- ✓ Item Depth below sediment surface
- ✓ Orientation (if UXO)

Unless specified by the Supervisor, all excavations shall be backfilled.

All identified targets of the anomalies shall be recorded with following details:

- ✓ Photo
- ✓ Date and time
- ✓ Depth underground or riverbed
- ✓ Time from start to the end of the uncovering procedure
- ✓ Coordinate
- ✓ Description
- ✓ Position of the object in the compass rose
- ✓ Weight (measured by a spring scale or similar)

If the anomaly is found to be an UXO:

1. The Contractor shall immediately inform the Supervisor and MAC.
2. For each UXO, the Contractor must fill an UXO identification form.

The technical description of the bombs used during the bombing attacks of 1999 is given in Appendix VIII. The Contractor will verify these data and include in his procedures the information required for UXO clearance. The Contractor will be responsible for the verification of the presented data.



7.6.1 Procedure

The clearing procedure depends from the environmental conditions with zero-visibility, the calculated depths of the item; the top soil conditions, from the current of the river, the water depth and the depth under the riverbed.

Basically a procedure for following recovery procedures must be provided and described in the Technical Proposal.

Before beginning of activities following preconditions must be fulfilled:

- ✓ Approval of the following documents specified according to the site conditions by the Supervisor: Method Statement, Health and Safety Plan
- ✓ Approval of the Traffic Safety Plan by the Site Captain and endorsed by the Supervisor and installation of the information boards
- ✓ Information and permission of the relevant State Authorities
- ✓ Installation of site office and performance of MEDEVAC training

Upon localizing of an UXO the Contractor will initiate procedures related to identification, render safe procedures and/or neutralisation, transportation and final disposal. These procedures must be in accordance with known and proved procedures and are subject to the approval of the Supervisor and the Mine Action Center that has to be issued prior to the execution of the related activities.

The Contractor shall prepare a draft Render Safe Procedure (RSP) that shall relate to the individual phases of the UXO clearance procedures. A proper reconnaissance and identification shall be carried out by the EOD diver in order to determine the exact type of ordnance, its condition and whether it is possible to render it safe (every fused UXO must be considered as non safe to move – see below “In-situ Explosions Works”) or to transport it to a disposal area. Any and all procedures related to UXO detection, safety distances, removal and transport to the destruction area, as well as public information and notification of authorities must be included in RSP.

The Contractor shall prepare the procedure for neutralisation and disarming procedures which are appropriate to the UXO threat and that are consistent with accepted international EOD practice.

The final result of that procedure is a declaration of the Contractor that all investigated suspicious spots are free from dud bombs. Note that the Contractor is in charge to issue the Clearance certificate and hand-over certificate at the end of UXO operations.

7.7 Deactivation/Neutralisation

All unexploded ordnance **MUST** be removed after neutralisation and disposed of in a safe and controlled manner by EOD Team. The Contractor shall perform the deactivation (neutralization of UXO) by employing an EOD team or EOD diver that shall remove the fuse and initial filler, thus preventing the UXO to explode with the risk of “**unintentional detonation**”.

The Contractor shall strictly limit the number of persons involved in deactivation to those persons necessary.

The Contractor shall take all the protective measures against blast, seismic wave and explosion fragments impact, to keep the sound level at the site below 65 decibel, to safeguard the area, and to inform and instruct the population.

7.8 Excavation operations

7.8.1 Excavation

Excavation around UXO shall be performed very carefully by the Contractor till it is accessible for identification and deactivation by EOD diver. In case the Contractor uses pumps and water jets during the excavation the water pressure of 4 bars shall not be exceeded.

During the excavation the Contractor shall take all measures and cooperate with authorities to ensure a continuous uncovering operation, to prevent swimming within a 4 km radius and to keep vessels of all types (sailing and motor vessels) at a distance of at least 300 m from the location where the diving works are being carried out



7.8.2 Underwater excavation operations guidelines

1. When performing a variety of tasks, divers will be often required to excavate areas or enter excavated areas.
2. Hand jetting and airlifting material from the natural bottom can pose a threat of burial.
3. Extra precautions should be taken through the performance of pre-dive safety assessments.
4. Variations in bottom conditions can cause changes in stability, which might warrant a more conservative approach to operations than the outlined recommendations of this document.

7.9 Recovery

7.9.1 Methodology

The underwater EOD/Mine Clearance Diver (MCD) knows the methodology to remove underwater UXO from the bottom. This knowledge learnt with the NATO STANAG 2884 (underwater munitions disposal procedures – AEODP-01(A) Vol 1). Practical knowledge of this STANAG would be a great asset for the Contractor.

7.9.2 Tentative of approach

The recovery of UXO from the riverbed in a current is depending from the soil conditions and the current speed. It is possible with handheld tools (air lifter, water jet etc.) in the riverbed. To ensure safe working conditions for the divers and to protect the divers from floating objects already from a current speed higher than about 0.5 m/s a current shield must be used.

In case of objects deeper than 2 m the recovery pitch must be stiffened with rings or other protective devices (protective screen/baffle fluids, sheet pile box...).

The recovery with sheet pile boxes must be offered and priced in the “Breakdown of the Lump-sum Price” (if this method is proposed by the Contractor and need the prior permission of the MAC or MAC agreement).

But with the soil conditions detected with the CPT-measurements and the local conditions on site the sheet pile box has to be engineered and built up. The insertion of sheet-piles or must be done with a hydraulic press to prevent an impact of shocks and/or vibrations which could excite the fuse.

If for any reason that is not possible at the specific site, another method must be used and the threat assessment as well as the safety precautions has to be adapted accordingly. All methods used need the prior permission of the MAC and the Supervisor.

The Contractor has to describe a work method for all of the mentioned possibilities how he is going to do recovery according to the above requirements in his Technical Offer. The personnel, vessels, machinery and material etc. used for that purpose have to be exactly defined and described.

The classification according to the actual condition on site shall be determined and agreed in a common, measurement according to the recent water level before the start of the recovery. The depth of the deepest part of the target will be bindingly decided by a common measurement with a measuring rod with mud plate together with the Supervisor in comparison with the results of the previous survey.

7.9.3 Lift and drag

Lifting and dragging of UXO shall be performed by the Contractor only after deactivation/neutralisation and securing of the UXO. The Contractor shall tie to the sling of the hoisting advice or to the specifically prepared lifter, in such a way that it will not slip.

Lifting shall be performed at a safe distance. After the lifting the Contractor shall wait for 30 minutes and then drag the UXO to the location where it will be disconnected from the sling. This location shall be at least 1000 m away from any residential buildings, heavy traffic, etc.



7.9.4 Underwater lift bags operations guidelines (underwater recovery systems)

The purpose is to identify potential hazards and recommend safety precautions when working with underwater lift bags. The procedure is applicable for all sectors of the underwater operations, both inland and offshore.

1. When performing tasks underwater, divers will be often required to move or lift objects using the assistance of underwater lift bags.
2. Using underwater lift bags can pose a threat of uncontrolled ascent to the diver or object.
3. Extra precautions should be taken through the performance of pre-dive safety assessments.

7.9.5 Recovery QA/QC

After recovery of the UXO items the area where the items had been recovered must be resurveyed again in order to proof the accurate performance and to check if all parts suspicious to be UXO are recovered. That area must cover a rectangle exceeding the area of the former anomaly with a resolution of ± 10 nT (Contractor MUST be sure that this resolution is not a relation of cause and effect of electronic fuze activation for the air bomb or rocket type) on both sides minimum 5m. In case that those areas are covering more than 30 % of the whole area the whole area of the complete site must be resurveyed. Finally the contractor has to sign a declaration that the whole area of the site is free of any objects suspicious to be a 500 lbs bomb or larger UXO. The other buried metal object will be marked "FFE" (Free From Explosive: signifies items made inert and/or confirmed to contain no presence of explosives). This declaration must be signed by the Representative (responsible project manager) and the business manager of the Contractor. The criteria and thresholds to assess suspicious objects and to include or exclude it for consideration must be explained in the method statement delivered with the offer.

7.9.6 Equipment requirements

The following minimum recovery equipment needs:

- ✓ Contractor's boat must have navigation license as small commercial vessel according to Serbian norm and IMCA codes
- ✓ Tug with accordant power to navigate the equipment in the river
- ✓ Floating crane pontoon with cable crane of appropriate size and lifting capabilities of more than 80 to enabling the handling in a minimum distance 20 m apart from the midpoint of the slewing ring of the crane. The floating crane pontoon must be provided with anchor piles. The anchor piles must be provided with a movable anchor plate rigged to the feet of the pile with minimum 1 m² seat area to prevent a direct impact to possible UXO. A pontoon with an accordant mobile cable or auto crane is permitted too. A-bock cranes without slewing ring are not accepted because of there restricted moving capabilities.
- ✓ Current shield for protection of the recovery pit and the divers which must reach minimum 1 m above the water level with accordant weight to withstand the water pressure. The shield must be adaptable according to the actual water depth during recovery. The width of the current shield must be minimum 4 m.
- ✓ Air lift bags from 0.5 to 3 tons lifting capacities (for removal and transport UXO to the river bank)
- ✓ Complete, and comprehensive, diving equipment for the dive crew

Optional equipment (it depends of the methodology proposed by Contractor such as sheet piles boxes)

- ✓ Minimum 1 barge as reservoir for sheet piles and beams provided for construction of sheet pile boxes.
- ✓ Hydraulic press for inserting of sheet piles
- ✓ Two (2) Barges for transport of soil and or recovered objects.

7.10 Transport

Transport of UXO (after neutralisation) and any associated material to the final place of disposal / destruction must only be done once approval has been granted by the relevant authorities in accordance with Serbian regulations and IMAS rules. All fees and reasonable costs associated



with the final disposal / destruction of the UXO and any associated material are covered by this scope of work; these costs must be agreed in advance.

Transportation of any material by the Contractor shall be in suitable barges or vehicles which when loaded do not cause spillage. All loads shall be suitably secured. Any barge or vehicle not complying with this requirement or any of the local traffic regulations and laws shall be removed from the Site.

When UXOs or other ammunition (which has been rendered safe) will be moved, either for storage or to a site for bulk destruction, the Contractor shall apply national standards for the transportation, handling and storage of explosives. If national standards do not exist or are inappropriate, the Contractor shall apply the International Standards given in IMAS 10.50. Approval of the competent authorities or agencies for the transport / moving will be the responsibility of the Contractor.

7.11 UXO and Explosives storage

The Contractor shall safely store on the EOD work site explosives, UXO or other hazardous materials which have been rendered.

Explosives used in the EOD process should be stored in a container approved for the type and quantity of explosive being stored, which will be located outside the fragmentation zone of the EOD work site, in accordance with IMAS rules for the construction of storage boxes and magazines for explosive materials used in the EOD process. Where provision of this standard of container storage is impracticable, the Contractor shall be responsible for providing adequate safety measures (protective works, safety distances, physical security, sandbags wall, etc.) and should include protection against environmental factors in accordance with explosive manufacturers' instructions. Such storage should be considered as a temporary measure only.

The Contractor will make a written request to provide these safety measures and requires approval of the Supervisor.

7.12 In Situ Explosion works

7.12.1 Procedures

Any munitions or UXO detected during the land and underwater search MUST NOT be destroyed in situ. They may be neutralised (such as defused) on the site (i.e. rendered safe) before removal and then transported to the designated site for destruction.

The Contractor shall not destroy by detonation an UXO in situ with the exception that an UXO cannot be removed and special conditions are fulfilled.

Only in exceptional case where there is a too high risk related to neutralisation and removal of the UXO, an onsite blasting according to Render Safe Procedure (RSP) will be performed. In these exception circumstances UXO may be destruction on site; this requires a special permit, which will only be granted in exceptional case if it is the only safe manner of removal and after using all the UXO neutralisation methodologies.

Every fused UXO must be considered as non safe to move. If the EOD process and neutralisation is not possible, non safe to move UXO must be detonated in situ by the Contractor.

The underwater UXO that the Contractor determines to be unmovable without risk will be detonated in-situ by the EOD Diver/MCD. In recovery diving operations, it is not always possible to dispose of unexploded ordnance in the position where it is found. For safety reasons a means of remote removal to a safe area and a means of lowering in a controlled manner for disposal is therefore essential.

The detonation of non safe to move UXO must be performed at the end of the clearance work, once all ± 142 anomalies will have been investigated.

The Contractor may propose different UXO disposal; all techniques must be approved in advance by the Supervisor.

The Contractor must give the technique to protect the soil of riverbed of the blast effects. These techniques might include UXO disposal such as the "under floating can or lift bag" methodology following the different options proposed by the Contractor in the Technical offer.



Prior to proceed with the detonation of non safe-to-move UXO, the Contractor must inform the Supervisor and the relevant Serbian authorities. The Contractor will prepare documentation supporting this assessment of in situ destruction of the UXO to be presented for approval to the competent authorities and the Supervisor (the Contractor shall prepare and submit the documentation in three (3) fold to the Supervisor).

The Contractor must use special shape charge when detonating an UXO, and use the least damaging for the environment quantity of explosives necessary to ensure detonation. The Contractor must necessarily use protective measure to limit shell dispersion.

In case of sub-munitions found on the workplace, cluster bombs shall be disposed in place without transport. The contractor will be in charge of all the safety precaution to minimize the disposal and use protective measure to limit shell dispersion (such as sandbags, protective wall, etc.).

After the detonation, the Contractor must recover the Munitions Debris and handle them as required by the technical specifications.

If it proves to be necessary to destroy an UXO by in situ detonation the Contractor shall, before any explosive works take place, carry out a risk analysis for safety distances and inspect, register the status and take photos of surrounding existing structures and buildings prior to commencement of the work and after the completion of the work within the safety distance. The Contractor will arrange the constant watch; determine the security measures regarding the UXO up to the moment when it will be decided on its disposal.

Special emphasis shall be made to protect monuments and the Institute for Monuments Protection must be consulted before starting any blasting activities. Furthermore, all the urban municipalities where the blasting activities take place must be informed by the Contractor in writing.

Prior to proceed with the detonation of non safe-to-move UXO, the Contractor must delimit an exclusion zone, using enough sentries to control access to the exclusion zone.

7.12.2 Safety measures

The Contractor shall take all measures to design the sectioning of the site as follows;

- a) Provide a clearly visible separation of hazardous areas including fragmentation zones, cleared areas, areas not investigated of and around the work site;
- b) Control the movement of diving and/or EOD employees and visitors (including members of the public) at the work site. Put up signboards and markings for protection of pedestrians and traffic.
- c) Limit the number of diving and/or EOD employees and visitors allowed into the blast and fragmentation hazard zones in accordance with the IMAS regulations. This shall be achieved by informing the local population, divers and/or EOD workers and EOD work site visitors about the scope and extent of the work site and the blast and fragmentation hazard zones. Furthermore entry into the hazard zones during the UXO hazard destruction processes will be physically controlled by warning signs and positioning sentries;
- d) During the controlled destruction of mines or UXO, take all reasonable precautions to exclude diving and/or EOD employees, visitors and members of the local population from the blast and fragmentation hazard zones, or provide suitable protection inside buildings, bunkers or mobile structures;
- e) Include measures to prevent structural and environmental damage.

In addition, the Contractor shall take the following precautions:

1. Announcing the explosion activities in local newspapers to inform and to warn the public
2. The Contractor shall carry out vibration measures during the blasting.

The Contractor shall plan all explosion activities carefully in close co-operation with the Supervisor and the competent authorities. The Contractor shall be fully responsible for any damage caused to public or private properties, during execution of the work.



7.13 Disposal

The basis for the UXO clearance methodology that will be applied for the clearance work is to identify the UXO, neutralise these where after the ammunition is transported to a safe location for disposal.

Currently, the approved and designated site for destruction in this region is at Petrovo Selo, which is about 48 km away from Prahovo (North part); the site meets all the requirements and contains all that is necessary for such works at a distance of.

The Contractor shall dispose of the UXO by transporting it to the approved area, assigned by the competent authorities.

The Contractor shall have contacted, prior to the submission of his Tender, all competent authorities to determine the conditions, technical and financial, under which the blasting of Unexploded Ordnances will take place.

7.14 Diving and underwater operations

7.14.1 Diving activities

For the underwater operation once the target criteria is set, Contractor will deploy an underwater EOD Team to access and expose each target individually, ensuring a positive identification of all items of ordnance. Various methods are used for removing UXO or suspicious objects. These methods include using underwater recovery lifting bags and other equipment from underwater salvage tool kits, cranes, or underwater cutting equipment, etc. The Contractor must describe his proposed method in the method statement. Sometimes a combination of several techniques is necessary.

This section establishes the requirements for diving operations, oversight of Contractor diving operations and Reclamation diving operations. Issues discussed include dive team requirements, diver qualifications, pre-dive planning, hazard control measures, supervision, equipment, recordkeeping, accident reporting and first aid, recompression (if necessary), surface-supplied air diving, scuba diving, and communication systems.

Underwater UXO placement original techniques are basically the same as surface applications. However, the requirement for the EOD diver to wear awkward diving equipment and to work with strong current and in a zero-visibility environment greatly increases the difficulty of the operation.

All diving activities and underwater operations in this project are dangerous; particularly because of the possible presence of UXO and river current; all divers must be particular prepared. In currents of more than 0.5 m/sec the diver must be provided with appropriate safety measures in order to enable him to use both hands for work. In currents exceeding 1 m/sec the diver is only permitted to work behind a current shield whose height must extend beyond the water level.

Divers must be protected at all times from floating debris.

The use of handheld equipment to excavate suspicious objects is permitted behind a current shield in depths up to 1.5 m below the riverbed. All objects buried deeper than this requires special facilities. The Contractor may propose different techniques or variants; all techniques must be approved in advance by MAC and the Supervisor.

These techniques might include rings, protective shield or maybe sheet pile boxes following the different variants proposed by the Contractor in the Technical offer. In any event the dimensions of such protection must exceed by an agreed safety margin the dimensions of the suspicious objects, but depending of UXO because in certain cases, an encountered UXO item will be unsafe-to-move or to approach without an appropriate positioning for these techniques and with the risk of “**unintentional detonation**” (detonation of UXO that was not planned in advance...).

Divers must be equipped according to EU Directive 89/686/EEC (No 3.11, Annex III) with helmet, air hose and telephone cable and safety rope (the “hose and rope system”) and provided with surface supplied air. A tank supply of air is only permitted as an additional emergency pack and precaution.

The Diving Supervisor must be in permanent connection to the EOD-Divers via diving telephone. The diving activities must be continuously monitored by an observation camera (it



depends of the water visibility conditions). The video of those activities must be continuously recorded. For that reason the EOD divers have to be equipped with diving helmets carrying a headlight and a video camera mounted on the top of the helmet (Kirby Morgan helmets or similar). Copies of the recordings must be lodged and logged with the supervisor and kept for a period of five years after the completion of the contract.

A dive link must be provided linking the diving operator directly with the EOD diver; this must enable video monitoring of the operations observed by the head camera (it depends of the visibility).

In the event of lifting of large items from the riverbed, underwater recovery lift bags must be provided with lifting capacities of up to 3 tons (such as “Premier Parachute Totally Enclosed Lifbag type” or similar).

7.14.2 Dive platform

The majority of underwater UXO work performed by EOD/MCD requires the use of surface-supplied diving equipment. This requires time to move and set up before diving operations can begin. Once on site, an EOD diving section may need several hours to prepare before deploying a surface-supplied EOD diver into the water. Air compressor and high-pressure air flasks located on the surface provide breathing air.

If surface-supplied operations are conducted afloat, a suitable diving platform must be available for support. It should have certain minimum characteristics:

- . Be able to safely carry all required equipment (maybe including the recompression chamber – it depends to the depth)
- . Provide adequate shelter and working area for support crew and divers, including a wash-down station and a warming area in cold weather
- . Be equipped with adequate navigation, signalling, and mooring gear.
- . Include required lifesaving and safety gear.
- . Be able to carry an additional small boat (if required) to rescue distressed divers, retrieve floating objects, and provide transportation in the event of an emergency or injury.

7.14.3 Surface-supplied air diving 0-30m max (with no decompression): scope and application

The following are minimum requirements for surface-supplied air diving operations:

The minimum number of personnel comprising a dive team is never less than three (3); however, planning must take into consideration not only the direct requirements of the work to be performed, but also additional factors either known or suspected that may lead to complications during the conduct of the intended operation. Merely because a dive team comprised of three persons may be adequate during one operation does not mean the same number of persons will be sufficient to accommodate the requirements of another operation.

At least one qualified dive team member assigned to each dive crew must be fully competent, equipped and designated to perform the duties of a Standby Diver in order to render emergency assistance to a regularly assigned diver.

The Operations Manager and Diving Supervisor must carefully consider manning levels of the dive team. Although regulations may permit diving with a minimum crew of three (3) persons that level of manning is strictly under optimal conditions. For example, any time underwater operations are intended to take place in a remote location, or where an air gap from the diving station to the water exceeds 5 m, at least a fourth (4th) member of the dive team should be considered.

Individuals other than a member of the dive team may be used to physically tend cables and/or lines entering the water. These individuals must at all times be immediately responsive to direction from the Diving Supervisor or Designated Person in Charge.

Shallow Operations with Large Crews: when a diving operation takes place in less than 30 m and the on-shift crew size is 8 or more, then a Diving Supervisor, who is not part of the diving rotation, must be part of the crew.



7.14.4 Minimum Personnel Requirements for one underwater task: (see Appendix IX – Personnel qualifications)

- 1 Air Diving Supervisor
- 1 Diver (and 1 EOD Diver until the UXO neutralisation before the removal)
- 1 Tender/Diver who shall be properly equipped and capable of performing the duties of a Standby Diver.

7.14.5 Operational Guidelines

1. The approximate depth of each dive shall be determined prior to the start of operations.
2. The breathing mixture supplied to the diver must be composed of a mixture of gasses that is appropriate for the depth of the dive. When using mixed gas or enriched air, all gasses must be analyzed before it goes on-line for O2 content and for proper mixture necessary to support the maximum depth of the planned dive.
3. Each diver shall be continuously tended while in the water by a separate dive team member.
4. Each diving operation shall have a primary breathing gas supply sufficient to support all divers for the duration of the planned dive (including decompression if necessary).
5. Except when heavy gear (i.e. MK V type equipment) is worn, a diver-worn or carried emergency gas supply (EGS) shall be utilized.
6. If no decompression chamber is on site, the nearest manned operational chamber should be known and an evacuation plan should be in place.
7. Two-way audio-communications between the diver and topside are required

7.14.6 Minimum Equipment Requirements

- 1 air source and volume tank to support two (2) divers
- Topside secondary air source
- Adequate supply of gasses for the planned dive profile
- 2 hose groups consisting of:
 - Air hose
 - Strength Member/Strain Relief
 - Communications Cable
 - Pneumofathometer Cable
- 1 set of air decompression and treatment tables
- 1 control station consisting of:
 - Communication Systems
 - Depth Gauges and Gas Distribution System with the capability to supply and control two divers at the maximum work depth
- 2 time-keeping devices
- 1 basic first aid kit with means of manual resuscitation (pocket mask or others). Local regulatory authorities may require additional equipment and training
- Emergency O2 administration kit
- 2 sets of divers personal diving equipment consisting of:
 - Helmet or Mask
 - Diver Worn EGS
 - Weight belt if needed
 - Protective clothing
 - Tools as required
 - Safety Harness
 - Knife
- Spare parts as required



- Logbooks, dive sheets, safe practices manual, first aid handbook, and written JSA applicable to job

7.14.7 Standards for Underwater operations: procedures, checklists and guidelines

1. The Safe operations manual must provide for the safety and health of the divers. The Safe Practices/Operations Manual shall meet or exceed the requirements of the International Standards for Commercial Diving and Underwater Operations. These standards may be used as a set of minimum guidelines to assist companies in developing their own specific Safe Operations Manual. Each contractor is responsible for completing, modifying, and/or complementing any of the procedures, checklists, and standards in accordance with applicable governmental regulations and as dictated by specific policies and practices of the employer.
2. The Safe Operations Manual shall, at a minimum, contain the following information:
 - a. A copy of applicable government regulations for the conduct of commercial diving or other underwater operations.
 - b. For each diving mode engaged in:
 - I. Safety procedures and checklists for diving operations.
 - II. Assignments and responsibilities of dive team members.
 - III. Equipment procedures and checklists.
 - IV. Emergency procedures for fire, equipment failure, adverse environmental conditions, medical injury, and illness.

7.14.8 Emergency aid

1. The Contractor shall develop and maintain a list of the available sources of emergency aid, equipment, and professional assistance with call signs, phone numbers, or other means and instructions for establishing contact with them for locations where operations are conducted.
2. The Contractor shall make the contact list available at the company's principal place of business, at the field operations office, and to those who may have a need for it to fulfil the company's emergency response plan.
3. The list shall include information necessary to obtain the following types of emergency aid as appropriate for the type of diving or underwater activity conducted:
 - Decompression chamber
 - Hospital or medical treatment facility
 - Air or ground transportation
 - On-call physician
 - Police, Coast Guard or other National Rescue Coordination Centers
4. Two-way communications shall be available and accessible at any diving, or other underwater work site in order to engage emergency services as required.

7.14.9 First aid

1. First aid supplies appropriate to the type of operation being conducted shall be provided and kept readily accessible in a clearly marked container at the work site.
2. In addition to any other first aid supplies, and standard first aid handbook (or equivalent) a means of manual resuscitation (pocket mask or others) is required. Local regulatory authorities may require additional equipment and training, (i.e. Emergency O2 Administration Kit).

7.14.10 Designed "Diving Supervisor"

1. A qualified person shall be designated in charge of each diving operation. The responsibilities of such designated persons should include job planning, coordination, record keeping, and proper response to any job-related emergency, as well as knowledge of the appropriate governmental regulatory agency regulation.
2. Responsibility: the Diving Supervisor is responsible for the welfare and safety of the dive team. However, the diver is responsible for ensuring that he is familiar with the principles of



underwater lift bag operations. Additionally, the diver is responsible for ensuring that he is performing tasks utilizing underwater lift bags in a safe and responsible manner.

7.14.11 Standby diver requirement

At least one member of every dive team shall be designated the Standby Diver and should be suitably prepared to enter the water when directed by the Diving Supervisor.

Prior to commencement of the operation, the Standby Diver's equipment shall be fully verified as functioning correctly and thereafter maintained in that condition until completion of the dive.

Should the Standby Diver be required to enter the water, a surface check shall be completed to ensure proper breathing gas supply, bailout function, and effective communications before the diver leaves the surface. The Standby Diver shall utilize the same mode and level of equipment as the primary diver.

7.14.12 Planning and assessment

The planning of a diving or underwater operation shall include a Dive Operations Plan.

During the planning and assessment phase of a diving or underwater operation before diving operations commence, a plan must be developed to ensure the safe and efficient performance of the work. In either case the Dive Operations Plan is a critical element of any diving or underwater project.

In general the Operations Plan will address such issues as the details relative to the goals and methods for the project, operational sequence, operational safety, crew and equipment requirements, emergency procedures, communications and regulatory requirements. This list is not finite and the items to be addressed in the Dive Operations Plan will be uniquely dictated by the specifics of each particular project.

A Dive Operations Plan differs from the Job Safety Analysis (JSA) in that JSA is focused specifically on project safety only whereas the Dive Operations Plan is designed to ensure the work is well understood, properly planned, manned and equipped.

7.14.13 Job/project safety

- Dive operations should be planned in accordance with regulatory authorities and Standards.
- Certified Diving Supervisor shall be in-charge of the diving operation.
- All diving personnel shall be certified for the task they are assigned.
- Emergency Response Plan shall be available, posted, and reviewed by all personnel.
- Pre-Dive Safety Meeting shall be conducted.
- Job and all tasks shall be defined, reviewed, and understood by the dive team and vessel personnel.

7.14.14 Job Safety analysis (JSA)

Before any underwater task, a Job Safety Analysis (JSA) shall be performed.

The purpose of the JSA is to provide a written document identifying hazards associated with each step of a job, and to develop solutions that will either reduce, eliminate, or guard against hazards. Keep the sentences short and simple.

1. Sequence of Basic Job Steps

Break the job into observable steps. Try not to be too general or overly detailed.

- If the job is complex, break it into several tasks: prepare a JSA for each task.
- Begin with an active verb, i.e., disconnect, check, invert, assemble, isolate, start, stop, etc.
- Number each step.

2. Potential Hazards

Identify possible hazards associated with each step and list that hazard opposite the job step.

- Consider potential accident causes (strain, sprain, slip, fall, cut, crush, etc.).
- Consider environmental and health hazards (vapors, gasses, heat, noise, toxicity, etc.).

3. Recommend Safe Procedures and Protection



Develop solutions for each potential hazard and list the solution opposite the hazard.

- Detail controls, i.e., ventilate, isolate, allow to cool, secure, guard, etc.
- List Personal Protective Equipment (PPE) required, i.e., gloves, eye protection, respirators, fall protection, etc.

4. Assign Responsibility

- Assign a specific person the responsibility of implementing the safety procedures or protection required.

5. Personnel Involved

- Identify the persons preparing, reviewing, and approving the JSA.
- Distribute the JSA to all personnel involved in the job or task and ensure that each is familiar with the contents of the JSA.

6. Revising the JSA

The JSA should be reviewed and updated whenever new equipment, products, or procedures are introduced into the work site. This is especially true if an accident has occurred on a task upon which a JSA has been performed.

7.14.15 Team briefing

1. Before commencing with any underwater operation, the dive team members shall be briefed on:

- The tasks to be undertaken
- Safety procedures for the diving mode
- Any unusual hazards or environmental conditions likely to affect the safety of the underwater operation
- Any modifications to operating procedures necessitated by the specific underwater operation

2. Before each dive the diver shall be instructed to report and record any physical conditions, problems, or adverse physiological effects that may render the diver unfit to dive.

7.14.16 Determination of dive

The working interval of a dive shall be terminated when:

- Directed by the Dive Supervisor and/or the Person in Charge
- The diver requests termination
- The diver fails to respond correctly to communications or signals from a dive team member
- Communications are lost and cannot be quickly re-established with the diver, the Tender/Diver, and/or the Diving Supervisor
- In-liveboating operations, the person controlling the vessel requests it
- The diver begins to use the diver-carried reserve breathing gas or the dive-location reserve breathing gas

7.15 Completion of the works

7.15.1 Preamble

The documentation, which is made available by the Contractor for completion of the works, shall provide sufficient evidence that the clearance requirements have been met in accordance with the IMAS. Clearance is achieved and demonstrated in two stages, being:

1. Stage 1: involves the monitoring of the Contractor's management systems and operational procedures before and during the clearance process, and
2. Stage 2: involves the inspection of cleared land and underwater by sampling.

IMAS provides guidance on the monitoring requirements and on the procedures to be adopted for post clearance inspections.

The Contractor is responsible for all arrangements and execution of activities to meet the requirements related to the execution of the activities and works of the Stage 1 and Stage 2.



Reports produced during the monitoring and post-clearance inspections, together with follow-up inspections to confirm that any corrective action has been successfully completed, should be included in the handover documentation.

7.15.2 Survey marking

The Contractor shall during the execution of any survey indicate the perimeter of the hazardous area with survey markers. Furthermore, the information obtained during clearance should indicate the actual location of each UXO.

The Contractor shall, based on this information redefine the perimeter of the area, and re-position the permanent survey markers to show the actual area cleared. The access roads, tracks, and all areas cleared during general survey at the beginning of the works contract, will be marked with plastic bags and maintained in perfect conditions.

Buried metal objects (FFE) should be used as permanent markers. The new positions should be accurately surveyed, and the co-ordinates of the turning points and intermediate points should be recorded for future reference.

The Contractor shall clearly mark land that has not been cleared prior to handover for whatever reason, or that cannot be confirmed as cleared with permanent hazard marking systems.

The Contractor shall, for such areas, if possible use physical barriers such as robust fencing to reduce the risk of unintentional entry into the remaining hazardous area(s). The Contractor shall follow the IMAS guidance on hazard marking.

7.15.3 Hazard marking

The Contractor shall clearly mark land that has not been cleared prior to handover for whatever reason, or that cannot be confirmed as cleared with permanent hazard marking systems. The Contractor shall, for such areas, if possible use physical barriers such as robust fencing to reduce the risk of unintentional entry into the remaining hazardous area(s). The Contractor shall follow the IMAS guidance on hazard marking.

7.15.4 Documentations

The Contractor's activities will be executed at the site location as indicated above. The project location will be handed over to the Contractor by the Supervisor and by the Mine Action Centre in the presence of the Contracting Authority and the EU Delegation.

For the preparation of the completion report and hand-over certificate the Contractor shall collect and record all information in a systematic manner during the clearance operation. Whenever possible use should be made of standard and proven Information Management Systems and GIS, such as IMSMA or similar.

The completion report prepared by the Contractor should include at least the following information:

- a) Hazard area and task identification numbers;
- b) Clearance requirements – specified area and specified depth;
- c) A copy of the technical survey report;
- d) Details of the Contractor, including references to its accreditation and licenses;
- e) A summary of the procedures and equipment used to clear the area;
- f) Quality Assurance, with details on the body, which conducted the monitoring, the methods used and reports provided;
- g) Post-clearance inspection reports, with details of the authority/institute, which conducted the inspections, the method used and reports prepared;
- h) Details of the cleared area(s): co-ordinates of the turning points and intermediate points, and a list of the UXOs located and destroyed during clearance;
- i) Details of reduced and cancelled area(s);
- j) Details of any incidents and accidents, which occurred during clearance;



- k) A formal recognition from the mine/UXO affected community of community involvement and acknowledgement of the final status of the land; in conformity with IMAS 07.41 Monitoring of MRRE organisations;
- l) A comparison with known minefield/UXO records; and
- m) A formal declaration (see IMAS example) that indicates that the area has been cleared over the specified area to the specified depth. The Supervisor will be the custodian of all completion reports, handover certificates and supporting information

The documentation of the result of geophysics is basic of a cost effective and safe performance during; uncovering and recovery of objects and consists of a text part and an attachment part.

The text part should represent as minimum following issues in a general part and split into land and water survey:

- ✓ Background and subject of survey
- ✓ Variations of the of scope of the projects with justification
- ✓ Explanation of areas excluded from survey and data processing
- ✓ Description of each specified survey area with details and restrictions important for understanding of results
- ✓ Description of survey method and equipment used
- ✓ Description of geodetic field survey system
- ✓ Description of positioning system during data acquisition
- ✓ Description of measures to ensure the quality of results
- ✓ Description of the performance under the specific circumstances on site
- ✓ Particularities during data acquisition and data processing
- ✓ Analysis of possible errors during data acquisition and data processing
- ✓ Dimensions and influence of the errors on accuracy of the result
- ✓ Comparison of object maps resulting from the different physical methods used (Scuba diving, multi-beam, Side-scan, Sub-Bottom, Magnetic, marine magnetometer...)
- ✓ Drawings and interpretation of the data
 - Magnetic software and features for data processing
 - Used modelling
 - Criteria for selection of suspicious anomalies
 - Interpretation and discussion of results
 - Object list with assessment of the UXO-relevance
 - Manual for use of the electronic maps
- ✓ Recommendations how to proceed with additional survey to complete the results of the survey and the recovery of suspicious objects.

Logbook recording the sequence of the recovery action with

- ✓ Position of the expected item
- ✓ Safety measures and hazard evaluation
- ✓ Record of uncovering activities
- ✓ Equipment used for recovery
- ✓ Personnel present on site
- ✓ Result of activities
- ✓ Position of the item found
- ✓ Picture, dimensions and mass of the item

In case of UXO additionally:

- ✓ Description of identification method
- ✓ Record of type and fusing (if possible)
- ✓ Record of activities agreed upon with MAC and Supervisor
- ✓ Record of uncovering activities after identification
- ✓ Record of state, including hazard evaluation
- ✓ Description of EOD neutralisation recommended (hand tools, explosives disrupters, special shaped charge, dearmers, tape & line, rocket wrench, abrasive cutting equipment, etc.)



- ✓ Record of neutralisation (defusing) and removal based on the decisions agreed and the updated SOP.
- ✓ Record of transport and disposal based on the updated SOP.
- ✓ Transport to the demolition area appointed by the Mine Action Centre Serbia
- ✓ Record of disposal of ordnance.

Overview of the survey area in appropriate scale

- ✓ Detailed maps with results of geophysics and recovery
- ✓ Colour-coded anomaly maps in appropriate scale with object numbers
- ✓ Marking of areas excluded (vegetation, waste, objects, process ability etc.)
- ✓ Map with x,y-coordinates of the suspicious anomalies
- ✓ Object list of anomalies as Excel spreadsheet with:
 - x,y-coordinate WGS 84 and Gaus-Kruger
 - z-coordinate of the centre of the magnetic field under surface (Land, riverbed)
 - Magnetic Moment in [Am²] and calculated "magnetic" volume
 - Length of the dipole
 - Minimum and maximum of the anomaly
 - Diameter of the used model shape >- Azimuth and inclination of dipole
- ✓ Maps with results of Scuba diving, Multibeam, Side-Scan and Sub-bottom, marine magnetometer...
- ✓ Overlaying of maps with different methods (Scuba diving, multibeam, Side-scan, Sub-Bottom, Magnetic, marine magnetometer...) to demonstrate objects visible with several methods with AutoCad-layers or GIS

3D plan of all recovered UXO with pictures and details.



8 SITE REGULATIONS AND PROVISIONS

8.1 Site

The project will be based in Prahovo port. Travel throughout Serbia may be necessary. A number of permits (see Appendix III) are required for work in this area.

The Danube location of suspected UXO are described and presented in the Volume 5 – drawings.

The Contractor shall take all measures to design the Site as follows;

- a) Provide a clearly visible separation of hazardous areas including fragmentation zones, cleared areas, areas not investigated of and around the work site;
- b) Control the movement of diving and/or EOD employees and visitors (including members of the public) at the work site;
- c) Limit the number of diving and/or EOD employees and visitors allowed into the blast and fragmentation hazard zones in accordance with the International Mine Action Standards (IMAS) and in accordance with the Standard Operating Procedures for humanitarian underwater demining in South Eastern Europe. This shall be achieved by informing the local population, divers and/or EOD workers and EOD work site visitors about the scope and extent of the work site and the blast and fragmentation hazard zones. Furthermore entry into the hazard zones during the UXO hazard destruction processes will be physically controlled by warning signs and positioning sentries;
- d) During the controlled destruction of mines and UXO, take all reasonable precautions to exclude diving and/or EOD employees, visitors and members of the local population from the blast and fragmentation hazard zones, or provide suitable protection inside buildings, bunkers or mobile structures;
- e) Include measures to prevent structural and environmental damage.

8.2 Control area

The Contractor shall execute effective control of the workplace by establishing and clearly marking a number of areas for safety and administration. Such areas shall be outside the relevant safety distances from all contaminated areas, clearance activity and explosive storage.

8.3 Visitor reporting briefing area

The Contractor shall ensure that the visitor reporting area and briefing area shall be a clearly marked and identifiable area that is located outside the fragmentation zone of the EOD work site.

8.4 Contractor Facilities

The Contractor shall ensure that experts and EOD personnel and MCD/EOD divers are adequately supported and equipped. In particular it shall ensure that there is sufficient administrative, secretarial and interpreting provision to enable experts to concentrate on their primary responsibilities. It must also transfer funds as necessary to support its activities under the contract and to ensure that its employees are paid regularly and in a timely fashion.

If the Contractor is a consortium, the arrangements should allow for the maximum flexibility in project implementation. Arrangements offering each consortium member a fixed percentage of the work to be undertaken under the contract should be avoided.

The Contractor shall provide all temporary facilities as required for his own use in the designated area, including proper amenities for sanitary purposes as may be necessary to comply with the requirements of the Republic of Serbia or of other bodies or tribunals having that jurisdiction in this field.

The Contractor shall provide for his own temporary utilities and shall pay all costs of temporary installations and charges for consumption of water, power, etc. The site camp must provide following requirements:



- ✓ Day accommodation for site leader and staff inclusive toilets, washing facilities and break rooms with free web access and power supply 220 V
- ✓ Fencing and/or safeguard of the camp
- ✓ First help facilities
- ✓ Personal protection equipment (PPE)
- ✓ Organisation of Medevac and Casevac
- ✓ Supply of technical support (tools, fire fighter equipment, boxes, barrier tape etc.)
- ✓ Providing of storage areas

The Contractor may make his own arrangements at his own cost for the temporary use of any other area outside the Work Area. The Contracting Authority will not accept any responsibility or liability in connection with such other areas. However, such areas shall be considered part of the Site and they shall be subject to the terms of the Contract.

After installation on site the Supervisor shall check the correct installation and function of the equipment in a test. The minutes of that test together with the results will be delivered to the Contractor. In case the results are not satisfying the contractor has to repair immediately the equipment or land the installation accordingly and the test has to be repeated.

Without approval of the Supervisor the use of equipment for survey, diving activities and recovery of UXO is not permitted. The handling and use of tools and equipment has to be described in the Method Statement.

8.5 Office for the Supervisor on site

At the contractual commencement of works, or such later date as instructed by the Supervisor, the Contractor shall prepare and submit a plan of the Supervisor's site office located next to the Contractor's facilities. The Contractor shall provide and maintain for the Supervisor, including heating, fuel, and lighting and cleaning, the following site office facilities:

- ✓ An office, minimum 20 m², which shall consist of a room or area within the Contractor's, Office.
- ✓ The office shall be furnished with a desk suitable for laying out the survey drawings and work drawings, filing cabinets and a minimum of 2 office chairs, and with access to toilet and washing facilities and web link.

The office facilities shall be made available for all representatives from the Contracting Authority and the Supervisor.

The cost of amenities (electricity, fuel, water, sewage, and disposal of waste...) shall be borne by the Contractor.

The Contractor shall provide communication facilities of telephone, e-mail and fax for the Supervisor and his staff within reasonable limits for the execution of the Supervisor's activities for the implementation of the contract. The cost of connection and rental for the telephone, e-mail and fax machine will be borne by the Contractor.

Software solutions used by the Contractor for survey (land and underwater) must have a viewer enabling the Supervisor to check the results of the survey by his own. Special software solutions used by the Contractor must be demonstrated in its abilities and features. The delivered viewer must be accepted in its functionality by the Supervisor in writing.

8.6 Site Cleaning

8.6.1 Site cleaning during Progress of Works

The Contractor shall maintain the site, each section as well as the whole site, including adjacent roads and quays, clean and in good order during the whole working period.

If the Contractor fails to remove any surplus or waste materials from the site within 3 days after being instructed to do so by the Supervisor, the material will be removed by another company at the Contractor's expense.

8.6.2 Final clean-Up on Completion

The entire site shall be delivered on completion of the works, in a clean, neat and presentable condition, all structures completely repaired, areas top soiled with grass and riverbanks with intact pavement and protection.



8.7 Access to Site

8.7.1 Access and Maintenance of roads

Access to site offshore shall be by temporary quays and piers constructed by the Contractor, including the necessary temporary roads on site.

The Contractor shall ensure that his quays, barges; floating pontoon, etc at quays and river traffic will comply with all applicable rules and restrictions. He shall, clean any spillage he may have caused on roads within or around the Site on a daily basis.

8.7.2 Access and Maintenance of quays and Piers

Access to Site offshore shall be by temporary quays and piers constructed by the Contractor, including the necessary temporary roads on site.

The Contractor shall ensure that his quays, barges etc. at quays and river traffic will comply with all applicable rules and restrictions.

8.8 Information Boards

The Contractor shall, within 2 weeks after the date for the commencement of the works, provide for the approval of the site captain and the endorsement of the Supervisor, detailed drawings of Information Boards. The two Information Boards shall be placed on the bank, at each end of the site as directed by the site captain. Information Boards shall be of size 3 m x 2.4 m in design and with a text height of 0.2 m.

The Contractor shall supply, install, clean and maintain the information boards and dismantle and remove them after the completion of the work on the specific site.

8.9 Regulation of road and river traffic

Detouring traffic during the execution of the works forms an integral part of the work and falls under the direct responsibility of the Contractor. The Contractor is responsible for supplying materials, constructing detour roads, temporary installing, operating and maintaining all required temporary signing, signals and pavement marking barriers and other safety measures.

The Contractor shall contact the local port authority for the river traffic in the area where the works will be executed and provide information as required by this authority.

The Contractor shall ensure that the temporary signs, signals and marking shall fulfil the government requirements and the requirements of the Danube Commission for permanent signs, signals, buoys (or temporary beaconing) and marking.

The Contractor shall not execute any works that will interfere with the river traffic, unless these are unavoidable and justified through a specific request. Authorisation from the competent authorities, including the Supervisor, shall be obtained by the Contractor prior to the execution of these works implementing specific measures as required.

The Contractor shall be deemed to include all costs in his tender for the total regulation including preparation, approval, implementation, establishment, operation, maintenance and re-establishment after use.

The Contractor shall prepare and implement a Traffic Safety Plan and include it into the SOPs to comply with all applicable rules and restrictions. This must be submitted in draft to the Port Authority and agreed with them.

The Contractor shall obtain agreement of the Traffic Safety Plan from the road and river authorities, and he shall have it endorsed by the Supervisor.

Without the approval of the site Captain and the endorsement of the Supervisor a start of the site activities is not permitted.



9 HEALTH AND SAFETY SPECIFICATIONS

9.1 General

The Contractor shall take all relevant precautions related to safety and health of his own staff, Supervisor, Representatives of the Contracting Authority and third parties. These precautions will be clearly reflected in the Health and Safety Program, the SOP and in the Detailed Work Method Statement that have to be prepared for area where UXO clearance works have to be executed.

The general Health and Safety Plan, the Method Statement and the Quality Assurance Plan and the Quality Control Plan have to be adapted to the special site conditions and must be sent for approval of the Supervisor well in advance of the start of performance.

Approval from the Supervisor is a precondition for site activity.

The Contractor shall take all relevant and necessary precautions to maintain the safety and health of personnel. This obligation extends to visitors to the site and facilities. The measures shall be described in the Health and Safety Method Statement (H&SMS). Two weeks prior to the start of any activities the H&SMS has to be amended according to the specific conditions recognised on site according to a threat analysis conducted by the Contractor. This threat analysis, together with the risk assessment and the specific amendment to the H&SMS must be delivered to and approved by the Supervisor 48 hours before start of any site activities. Should circumstances alter subsequently, the Supervisor must be notified and the appropriate amendments noted and recorded.

The H&SMS shall include the following aspects:

- ✓ Threat analysis & procedures (including UXO & Underwater operation)
- ✓ Accident response plan
- ✓ Evacuation plan
- ✓ Occupational health

These are described in detail in the following paragraphs.

The draft detailed SOP together with the Health and Safety Method Statement must be submitted with the Tender proposal and shall cover all the requirements of these specifications and be in line with IMAS requirements

During all river activities on board vessels personnel must be equipped with life belts. As soon as excavators and cranes are deployed with a working height more than 2 m the personnel has to wear safety helmets.

The following commonsense safety rules apply to all munitions response actions and explosives ordnance disposal (EOD) activities:

Only qualified UXO/EOD and underwater EOD/MCD personnel can be involved in munitions response actions. However, non-UXO-qualified personnel may be used to perform a part of UXO-related procedures when supervised by UXO-qualified personnel. All personnel must be trained in explosives safety and be capable of recognizing hazardous situations (see Appendix IX – Personnel qualifications).

An exclusion zone (a safety zone established around an UXO work area) must be established. Only essential project personnel and authorized, escorted visitors are allowed within the exclusion zone. Essential personnel are those who are needed for the operations being performed. Unauthorized personnel must not be permitted to enter the area of activity.

Warning signs must be posted to warn the public to stay off the site.

Proper supervision of the operation must be provided.

Personnel are not allowed to work alone during operations.

Exposure should be limited to the minimum number of personnel needed for a minimum period of time.

Appropriate use of protective barriers or distance separation must be enforced.

Personnel must not be allowed to become careless by reason of familiarity with munitions.



9.2 Regulations

The Contractor shall comply with all National and Local laws, rules and regulations concerning construction safety and health standards, as well as with the Standard Operating Procedures for humanitarian underwater demining in South Eastern Europe. The Contractor shall not require and will prevent any worker to work in surroundings or under conditions, which are unsanitary, hazardous or dangerous to his health or safety beyond the accepted standards for the specific type of works.

9.3 Hazards Precaution and finding UXO

The Contractor must investigate and list all possible threats to his employees and other persons connected to the work and identify the necessary methods of protection against these possible threats. Such threats might relate to:

- Arrangement of the work (Safety lines, Current shield).place,
- Physical, chemical and biological impacts,
- Arrangements, selection and deployment of work equipment, machines, tools and its handling,
- Arrangement of manufacturing methods and process and operational procedures, and
- Insufficient qualification, knowledge and experience of employees.

The Contractor shall establish the necessary Hazard Precautions on finding undamaged ordnance and these will include:

- Do not jar or subject the ordnance to movement due to presence of a cocked striker.
- Do not move or disturb in any manner.
- Do not turn on or off any radio/radar transmitter due to Electromagnetic Radiation (EMR).
- Ground and discharge yourself by touching ground prior to touching the ordnance due to static electricity hazards.
- Observe one hour of waiting time before approaching due to proximity (VT) fuse system and thermal batteries.
- Be aware of ejection possibilities from the ordnance.
- Do not subject the explosives to heat, shock, fire, friction or rough handling.
- Observe a defined safety distance due to fragmentation risk.
- Be aware of any corrosive chemicals in the ordnance.
- Be aware of spring-loaded items.

In case the UXOs encountered in the riverbed or onshore, have been damaged on impact the Contractor may, on approval of the Supervisor, propose an alternative for the hazardous precautions to be taken. Approval will not relieve the Contractor from his responsibilities.

In the different procedures, work methods and detailed designs to be submitted by the Contractor, the above mentioned hazard precautions, but not limited to, shall be taken into account.

9.4 Minimizing risk for the local population

The Contractor shall during the planning and execution of EOD operations seek to minimise disruption to the local population, who may need to move through blast and fragmentation hazard zones. The Contractor shall take all precautions to reduce the risk of harm to the public to tolerable levels and use the following guide lines to develop these precautions:

- The extent of the fragmentation zone should be equivalent to the fragmentation hazard of the likely UXO contamination in the section:
- The public, having been given appropriate warnings as set out above, shall be allowed to pass on marked routes through the fragmentation zone, EXCEPT when demolition is taking place. When demolition is taking place the Contractor shall establish a cordon with sentries on routes



at the entry points of the fragmentation hazard zone to prevent entry into the hazard zone. It may also be necessary to restrict entry when particular munitions with a large fragmentation radius, such as bounding mines, are being cleared.

- An inner safety distance shall also be identified with a radius equivalent to the fragmentation zone from the likely UXO contamination, RF fuse or detonator hazards (whichever is greater). The public shall not be allowed to enter this safety zone at any time when EOD is being undertaken on the work site. Where the location of the work site means that this inner safety distance cuts a frequently used road or path, an alternative solution should be considered. If the work site is small enough, the EOD unit shall phase operations in such a way to minimise disruption to the public. If the work site is large, the Contractor shall seek the assistance of the local administration, police or other appropriate emergency services or the military to identify mark and possibly supervise the creation of a suitable diversion route. If no such diversion route is feasible, the EOD unit shall consider using protective works.

9.5 Preparation for an accident

The Contractor shall include in the preparatory activities if a diving and/or EOD accident occurs, the following:

- a) The development and maintenance of work practices or PPE designed to reduce both the risk of diving and/or EOD accidents and the risk of multiple victims resulting from a EOD accident;
- b) The pre-positioning of staff with the first aid and medical skills and resources required responding to a diving and/or EOD accident;
- c) Each diving and/or EOD work site shall include a first aid post, organised and equipped as recommended in IMAS and IMCA codes. The first aid post shall:
 - be identifiable and clearly marked;
 - be equipped with appropriate first aid and medical supplies and equipment;
 - where appropriate, be attended by suitably qualified and experienced medical or paramedical staff; and
 - be provided with easy access to the clearance area of the work site and easy access for ambulances.
- d) The development and maintenance of:
 - EOD work site management documentation that includes details of the blood group infections (HIV, hepatitis etc) and known allergies for each diving and/or EOD worker;
 - a capacity to transport victims to an appropriate treatment facility or surgical hospital or insurance to cover the cost of transport to a suitably equipped and staffed hospital;
 - insurance to cover the cost of surgical care and treatment, including prosthetics, for victims of EOD accidents;
 - insurance to provide an appropriate disability pension to diving and/or EOD workers who become victims of EOD accidents; and
- e) The periodic testing of emergency procedures and evacuation procedures from the time of the accident through to the delivery of a victim to an appropriate treatment or surgical care facility.

9.6 Diving and/or EOD accident response capability

The Contractor shall include in each diving and/or EOD workplace the following:

- a) Diving and/or EOD teams with resources to:
 - provide immediate first aid to a victim of a diving and/or EOD accident;
 - remove victim(s) from the hazardous area;
 - transport the victim(s) to an appropriate medical treatment or surgical facility or other collection point for further movement of the victim to the appropriate medical facility;
 - provide en-route medical care for the victim(s); and
 - communicate with the medical facilities, other emergency services or other coordinating organisations responsible for assisting the Contractor in providing an appropriate response to a diving and/or EOD accident; and
- b) Staff trained and equipped to:
 - clean and dress wounds correctly,
 - stabilize fractures,
 - give oxygen
 - give analgesia, and



- give antibiotics and anti-tetanus prophylaxis if the victim is not otherwise likely to receive them within two hours of the diving and/or EOD accident.

A draft diving and/or EOD accident response plan shall be developed and maintained by the Contractor for the workplace. The plan shall identify the:

- ✓ Training and qualification needs of all employees at the workplaces, in particular EOD workers and medical support staff with responsibilities for casualty evacuation and initial treatment;
- ✓ Equipment and materials required to implement the diving and/or EOD accident response plan, including: first aid and medical equipment, supplies and drugs; transportation required to move victims from the accident site to medical facilities offering treatment; and communications to call forward assistance and/or to provide details of the nature and extent of injuries; and
- ✓ Location of a suitably equipped and staffed hospital.

The Contractor shall prepare a draft diving and/or EOD accident victim evacuation plan that includes provisions that outline responsibilities and obligations for the:

- ✓ Management of the on-site emergency response procedures, which may include, for example, procedures to remove victims from hazardous areas;
- ✓ On-site first aid and medical care of victims;
- ✓ Movements of victims to a surgical facility with the capacity to provide appropriate surgical care, including:
 - details of planned routes and means of transport;
 - details of security requirements including requirements for crossing international borders or through internal security posts;
 - fuel, food and repair facilities on route;
- ✓ Medical care of the victim during movement from the accident site through to the surgical facility;
- ✓ Establishment and maintenance of diving and/or EOD accident response equipment, materials and drugs including:
 - on-site medical care equipment, materials and drugs;
 - an emergency response vehicle including specialist medical care equipment and fittings or fixtures to assist in the management of the victim during movement to the medical treatment or surgical facility; and
 - Preparation and maintenance of on-site and en-route communications.

The Contractor shall prepare and maintain an occupational health plan that shall include the:

- ✓ Briefing of all staff on the health hazards, including insect and waterborne diseases, and poisonous animals or insects native to the EOD area;
- ✓ Provision, where appropriate, of prophylactics against disease;
- ✓ Arrangements for periodic health checks;
- ✓ Provision of up to date injections against diseases such as tetanus, yellow fever and hepatitis, as advised by local or international health authorities.

In the different procedures (e.g. SOP, accident response plan, victim evacuation plan), work methods and detailed designs to be submitted by the Contractor, the above listed shall be incorporated. The Contractor shall take into account all necessary precautions to reduce the effects of an accident and to be fully prepared for an accident.

9.7 Occurrence of accidents

9.7.1 Initial notification

The Contractor shall notify the Supervisor and the Mine Action Center immediately if:

- a) Any accident occurs whether on Site or off Site in which the Contractor is directly involved which results in any injury to any person whether directly concerned with the Site or whether a third party.
- b) An incident in which a UXO damages equipment or property at a diving and/or EOD workplace;
- c) The discovery of a UXO located in an area previously cleared, recorded as cleared, marked as cleared or previously recorded as always being clear, regardless of whether harm has resulted from the UXO;



- d) Where diving and/or EOD employees, visitors or the local population are exposed to intolerable risk that results from the application of documented standards or SOPs, including the failure of equipment issued to employees; and
- e) Any unplanned detonation of UXO on an EOD work site irrespective of the cause or outcome.

Such initial notification may be verbal and shall be followed by a written comprehensive report within 24 hours of the accident.

9.7.2 Accident reporting

The Contractor shall include in the diving and/or EOD incident report the following information, as a minimum (reference is made to IMAS 10.60 “Example of demining incident report procedure” and “Example of demining incident investigation”).

Authorities receiving reports of incidents that highlight inadequacies of equipment, standards or approved SOPs, or that indicate the presence of new types of hazard, shall disseminate a general warning to all Contractors applying the same equipment, standard or SOP, or likely to meet the same new hazards. In the absence of a national EOD authority the Contractor shall assume this responsibility.

9.7.3 Provision and information

The Contractor shall report for investigation by authorities:

- a) Diving and/or EOD incidents resulting from the application of approved standards or procedures, a mine or UXO hazard missed during the clearance process;
- b) Diving and/or EOD accidents resulting in injury or death;
- c) Damage to property;
- d) Damage that may result in a major claim for compensation from a member of the local population; or
- e) EOD incidents as directed at a national level in order to obtain operational information for the purposes of behaviour change analysis, or as a random sampling investigation of civilian accidents.

The Contractor shall provide the Supervisor with information from the authority initiating a diving and/or EOD incident investigation as follows:

- a) A copy of the terms of reference if the Contractor(s) is asked to assist the investigating officer or investigating team in the investigation and the development of recommendations on improvements to the EOD process under investigation;
- b) Photographs of the incident site taken immediately; and
- c) Unless exceptional circumstances exist, the investigation report is submitted on time and that it is complete, clear, concise and accurate, including conclusions and recommendations for improvement.

9.8 Protection against Polluted Sediments

9.8.1 Personnel

Personnel involved in the uncovering and removal operations of UXOs may come in contact with sediment polluted with radioactive material as well as other contaminants, accumulated at the river bottom. Before starting the procedure of uncovering and removal of an UXO the Contractor will check the sediment for traces of radioactivity. In such cases the personnel shall wear standard equipment to monitor their exposure to radioactivity during the execution of the uncovering and removal activities.

At the location precautions have to be taken to avoid that personnel will be exposed to harmful level of pollutants originating from soil on land and from sediment in the rivers and in harbour canals.



9.8.2 Public waste supply

The Contractor will take all precautions to prevent increased levels of pollutants as a result of his activities in the public water supply system. The Contractor will inform timely the competent agencies and authorities during the execution of his activities, about this risk, so that efficient mitigating measures can be taken.



10 ENVIRONMENT

10.1 Environmental Protection Program

The Contractor shall take all relevant precautions related to protection of properties and historical buildings and archaeological sites and to protect the environment in minimising noise and air, ground and water pollution. The Contractor shall describe the measures in an Environmental Protection Programme (EPP). The EEP shall be submitted to the Supervisor for approval. If necessary, the program will be supplemented with calculations, measurements and other documentations.

The programme shall be submitted at least 7 days before commencement of the work on Site. The Contractor shall collect all waste and deliver it to disposal plant(s) or site(s) approved by the competent authority.

10.2 Applicable laws and guidelines

The Contractor shall execute the works in accordance with the laws and regulations that are in force. In this regard the following laws and guidelines are mentioned:

EU legislation:

- Directive No. 85/337/EEC-OJ No.L175, of 05.07.1985, and Addendum to the Directive No. 97/11/EC-OJ No. L073, of 14.03.1997.

Serbian Legislation (both Republican and Federal)

- “Zakon o zaštiti životne sredine”, Službeni Glasnik Republike Srbije br. 135/04 i i dr.
- The Act on Analysis of Environmental Impact of Works (Official Gazette of the Republic of Serbia No.66/91 and 53/95);
- The Law on Hazardous Matters Transport (Official Gazette of the SFRY 27/90)
- The Law on Explosive Matters (Official Gazette of RS 44/97)
- The Law on Water Resources (Official Gazette of RS 46/95 and 54/96)
- The Law on Waste Handling and the Rules on Waste Matters of Hazardous Properties (Official Gazette RS 25/96 and 12/95)
- The Law on Allowable Contents of Dangerous and Hazardous Matters in Soil (Official Gazette of RS 23/94)
- The Act on Limit Values of Emission, Mode and Schedule of Measurements in Soil (Official Gazette of RS 30/97)
- The Act on Allowable Noise (Official Gazette RS 54/92) and
- The Act on Hazardous Matters in Water, Hygienic Properness of Water, and Water Classification.

10.3 Waste collection

The Contractor shall collect all waste and deliver it to disposal plant(s) or site(s) approved by the competent authority.

10.4 Environmental monitoring during execution

When excavation activities and / or explosion activities are to be carried out, the Contractor shall inform the local water suppliers of municipalities where the activities are to be carried out (Public Utilities Company Water Supply and Sewage System), in order to set up an emergency plan for the water supply system. The Contractor shall communicate and correspond on this matter with the Supervisor.



11 QUALITY

11.1 Introduction

The final versions by the Contractor submitted outline Quality Assurance System (QAS) and of the indicative Quality Assurance Plan (QAP) during the Tender procedure, shall be submitted within 7 days before the commencement of the Works for the Supervisor's and MAC's approval. The documents will cover all aspects of the Contract and the Works must be implemented by the Contractor and shall be documented and maintained by the Contractor during the period of the Contract. The QAS shall by all means respect the IMAS rules.

The QAS shall show the overall Quality Assurance Organisation and the lines of overall responsibility, monitoring and action to be carried out.

Further the overall principles and procedures to establish the Quality Assurance Plans, Control Plans, QAS Organisation, etc. for specific activities and contracts, sub-contractors and suppliers shall be given.

11.2 Quality Assurance Plan (QAP)

The QAP, prepared by the Contractor, shall comply with the IMAS standard in all respects. The QAP shall be submitted for the Supervisor's and MAC's approval not less than 7 days before Commencement of the Works. The QAP shall, furthermore, as a minimum, cover the following issues:

- The Contractor's staff and management organisation for the project, management plan, and the quality assurance organisation. The person responsible for the Contractor's QAS shall be authorised and qualified to take decisions on quality assurance issues, and his reference and communication lines to the Company's overall quality assurance organisation and its responsible management shall be clearly shown.
- Persons performing quality control and testing shall be independent of those executing or supervising the Works.
- Management of documents.
- Management of procurement.
- Management of sub-contractors and suppliers, and requirements to their QAS's.
- Control of materials and workmanship, defects and material reconciliation, procedures for corrective actions, etc.
- Handling of deviations, additions or variations to the Contract Documents

The Contractor's system of management of current documentation for the execution of the Works shall include his sub-contractors and suppliers, and shall detail:

- How it is ensured that only valid and approved documents are used for the execution of the Works;
- The method of recording variations and amendments to the documentation

The Contractor's initial proposed Control Plan shall describe important and critical control activities based on the Tender Documents and the Contractor's own considerations in respect of execution of the Works.

11.3 Quality Control Plan (QCP)

The Contractor shall present for the Supervisor's approval his detailed QCP for all quality assurance efforts or measures for the works or sections thereof. Such QCP shall be presented to the Supervisor and MAC not less than 7 days before the commencement of the works or an approved section of the work.

The Contractor's proposed Quality Control Plan shall describe important and critical control activities based on the Tender Documents and the Contractor's own considerations in respect of execution of the Works.



The QCP shall include controls as specified in the Contract as well as any other normal and special controls that the Contractor finds necessary in order to ensure the quality of his work.

The QCP shall for each control activity describe type, method, range, time/frequency, criteria for approval and documentation and who is responsible for performing the activity.

If the Supervisor does not approve the QCP as submitted, then the QCP shall be amended for further approval. Subsequent changes in the range and contents of the Quality Assurance work will not cause changes in agreed deadlines or contract sums.

11.4 The Contractor's Control and Documentation

11.4.1 General

During the Contract period, the Contractor shall, to the satisfaction of the Supervisor and taking into account the directives of MAC, document that the Works comply with the Quality Assurance requirements stipulated in the Contract or approved during the Contract period. Consequently, based on the approved QAP and the QCP's, the Contractor shall during the execution of the Works carry out and document the quality control and its compliance with the stipulated requirements.

The Contractor's quality control does not limit his responsibility for the Works according to the Contract.

If the Supervisor, during the period of the Contract, can substantiate that the Contractor's control and/or documentation shall be extended, the Contractor shall follow the Supervisor's written instructions to this effect at his own cost and within the agreed time for completion.

11.4.2 Method of Documentation and Filing during Execution of the Works

All control activities specified in the Control Plan shall be documented by the Contractor.

The QCPs and all other issues related to the QAPs shall be kept and maintained by the Contractor in the Quality Manual.

On the basis of the QAP and QCPs the Contractor shall produce the necessary forms for registration, log books, and check lists, etc. before work is commenced.

The Contractor shall provide all documentation with identification, the date and signature of the person responsible for the documentation. The identification shall as a minimum comprise: name of project, activity number as defined in the QCP, time and place of the control activity.

All original documentation shall be inserted in a Control File in the Quality Manual, which shall be kept and maintained by the Contractor at the project site throughout the period of the project. In addition to the control documentation, the Control File shall also include all other relevant quality documentation.

The Supervisor shall have full access to the Control File at all times.

11.4.3 Documents at the Time of Delivery

At the time of delivery of materials and goods, the Contractor shall submit the following documentation to the Supervisor in two originals or in two certified copies:

- All certificates, documentation of tests etc. of purchased material and goods mentioned in the Specifications.
- All documents verifying that inspection control and tests performed are in accordance with the Specifications.
- Identification lists with cross-references between documents and material and goods for traceability purposes.

11.5 Right of Access and Audit

The Contracting Authority and its representatives, including the Supervisor and MAC shall be guaranteed unlimited access at any time to all documents and quality assurance documentation associated with the Contract. This also includes the same unlimited access to all production and manufacturing facilities.



When the Supervisor wants access to suppliers, manufacturers or subcontractors, the Supervisor will give due notice to the Contractor, whereby the time and the objective of the visit will be specified with the agreement of all parties involved.

The Contracting Authority will perform a Quality Audit at the start and the end of the project.

The Supervisor may, without notice, commission the execution of a Quality Audit, in the event of grave quality deviations or as a preventive measure, to check:

- that the approved Quality Plan is being observed
- that the conditions of implementation are in compliance with relevant rules, regulations and guidelines.

Unrestricted access to the site and documents shall be ensured also for the Representatives of the Contracting Authority for performing on-the-spot checks and inspections.

11.6 Sampling and Testing

11.6.1 Inspection of cleared areas

The Supervisor will carry out the inspection of cleared areas. This inspection forms part of a management process which aims to verify the quality of clearance, and to establish sufficient confidence that the Contractor has removed and/or destroyed all UXO hazards from the specified project area to the depth below ground surface as defined by the Project.

11.6.2 Sampling plan

The Contractor shall propose a sampling plan for the approval of the Supervisor and MAC taking into account the applicable IMAS.

11.6.3 Method of inspection(s)

The procedures and equipment to be used by the Supervisor to inspect the samples of cleared land will be approved by the Representatives of the Contracting Authority, and will be agreed with the Contractor as part of the contract or agreement. Any major changes to sampling or inspection procedures shall be agreed between the Supervisor and the Contractor prior to the start of inspection.

The Supervisor and the Contractor should agree a mutually acceptable time limit within which the sampling inspection must take place.

11.6.4 Acceptance criteria

An area will be considered as 'cleared' only if all the samples in the area are found to be free of UXO down to the depth specified in the contract. Where any sample in the area is found to contain one or more UXO, this will constitute a 'critical non-conformity', and the area containing that sample shall be declared to have failed the inspection.

Cleared areas may contain other indicators of potential non-conformity, such as residual metal fragments following detection by metal mine detectors, or residual traces of explosives following detection by explosives detectors. Such cases could indicate a potential critical failure of the EOD process (equipment, people or procedures), and again constitute a critical non-conformity. The conditions for acceptance or non-acceptance of all categories of non-conformity shall be agreed amongst the Supervisor, Mine Action Center and the Contractor prior to the start of clearance.

The definition of critical non-conformities must take into account the clearance methodology used by the Contractor as laid down in the Standard Operation procedures and the detailed Work Method Statement prepared for the execution of the Works.

11.6.5 Corrective action

The Representatives of the Contracting Authority and the Representatives of the MAC will determine the corrective action to be taken on areas that are rejected. Guidance on corrective action will be provided in advance and will be based on national standards and guidelines, and will form part of the Contractor's contract or agreement.



The Contractor should investigate every critical non-conformity and shall provide the Representatives of the Contracting Authority and the Representatives of the MAC with reasons for each critical non-conformity. The Contractor shall provide a programme of corrective action. If an area fails re-inspection following corrective action, the Supervisor having heard the Mine Action Center may require the area to be cleared again using a different sub-unit, different operational procedures and with different equipment, if these alternate methods exist.

If no acceptable reason is given for a critical non-conformity, either by the Contractor or by the EOD Authority, the Supervisor having heard MAC shall require the area to be marked until the reasons for the non-conformity can be established.

11.6.6 Re-inspection

Areas should not be offered for re-inspection until the Contractor has taken corrective action as agreed with the Supervisor and MAC in accordance with national standards.

The Supervisor will specify whether normal or tightened inspection shall be used for re-inspection. This shall be based on guidance provided by the Representatives of the Contracting Authority.

11.6.7 Record of inspections and results

The Supervisor will record the sample plan, the methods used for inspection and the results, including the location, depth, types of hazard and other non-conformities specified in the contract such as metal fragments or explosive residue. Details of all corrective action shall also be recorded. All records shall be passed to the Mine Action Center.



12 COMMUNICATION AND RECORDS

12.1 General

At all stages, the Contractor shall comply with the provisions of the “Communication and Visibility Manual for EU External Actions”¹².

The Contractor shall establish a system enabling communication with all the workplace, and parts thereof, where the operations take place, using frequencies available to any of those involved but restricted to only be used in the Explosive Ordnance Disposal (EOD).

The use of wireless communication must be restricted to operational requirements, especially during EOD activities.

All communications should special codes or phrasing to indicate steps in the operational, particularly in the event of lapses in procedure or the need for medical attention.

12.2 Site Diary

During any kind of works on the Site, the Contractor's nominated Representative shall keep a Site Diary, which shall comply with IMAS regulations. Report layouts from this standard can be used as format for the preparation of the Site Diary. Furthermore the Site Diary shall meet the following requirements:

- it shall be sewn up with the pages numbered and sealed;
- main data on the construction site, contractor, subcontractors, foremen and other responsible persons, shall be entered;
- a space shall be provided for the entries related to the Site in general (on possible changes, additional documents or instructions from the Supervisor, the Contracting Authority's or governmental supervising institutions);

The daily work record pages shall be inserted and the number of pages shall not be less than the number of days specified for the Works in the Site. The pages shall be made in a format to be agreed with the Supervisor, using the IMAS standard.

The daily work record pages shall be filled in each day in two copies:

- a copy inserted in the Site Diary
- a separate copy to be kept by the Supervisor

It shall be an obligation of the Contractor to make entries in the Site Diary with information generally required or additional information requested by the Supervisor/ Supervisor's Representative.

The daily work record pages shall be signed by the Contractor's Supervisor and Supervisor as soon as possible after the completion of the daily works or other activities such as measurements, but not later than on the next working day.

The Supervisor shall at all times have full access to the Contractor's copy of the Site Diary.

The Contractor's copy of the Site Diary shall be submitted to the Supervisor upon completion.

12.3 Daily report content

The Contractor's Daily Reports must, as minimum:

1. Indicate the date of the daily report
2. Identify the Contractor's Team Leader
3. Identify the Supervisor on site
4. Provide a brief description of the weather conditions
5. Provide the list of on site personnel and visitors (name, title and firm, hours worked/spent on site)

¹² Communication and Visibility Manual is available from http://ec.europa.eu/europeaid/work/visibility/index_en.htm



6. Identify and describe each phase/task that was conducted during the day
 7. Provide information on the anomaly investigated (number, name, description, etc)
 8. Provide the results of equipment calibration/testing
 9. Provide the results of quality control and/or corrective action
 10. Mention any incident/accident and provide the incident/accident report if applicable.
 11. Include the Anomaly identification table
 12. Include the UXO chain of custody
 13. Include the UXO identification form
 14. Include raw geophysical data
- The daily reports must be signed by the Contractor and the Supervisor on site.

12.4 Contractor to furnish returns

The Contractor shall, when required, furnish such returns (i.e. lists and charts) of plant, labour and progress as the Supervisor may direct. As a minimum these will be prepared and submitted prior to each management meeting.

12.5 Management meetings

The Contractor shall attend all meetings requested by the Supervisor and the Contractor shall submit information in relation to the agenda of such meetings.

The Contractor shall likewise be entitled to request a meeting with the Supervisor when relevant for the work execution. Such meetings shall be held on Site at the Contractor's main site office. The Supervisor will call for periodic management meetings at intervals not exceeding 14 days during periods of activity on Site. The frequency of the meetings may be increased to be one per week in periods where activities in the opinion of the Supervisor justify such additional meetings.

The following issues shall be discussed at the first meeting, and relevant items shall be followed up during ensuing meetings:

1. List of the Contracting Authority's and Contractor's organisations and subcontractors
2. List of the key personnel
3. Insurance policies
4. Permits (licences, labour, safety and environmental protection issues)
5. Work schedule
6. Cash flow schedule
7. SOP
8. Work site
9. Environment programme
10. Existing structures, buildings, sites, inspection and photographs
11. Materials, tools and equipment
12. Method statements
13. Traffic organisation
14. Discussion with miscellaneous items (or to do some troubleshooting)
15. Next meeting (date).

13 LOGISTICS AND TIMING

13.1 Location

The project will be based in Prahovo port. Travel throughout Serbia may be necessary. A number of permits are required for work in this area (see Appendix III).

The execution of the works is subject to approvals and coordination with navigation authorities and other competent authorities of Romania. The competent port authority for regulation of waterway traffic on Serbian side is the Prahovo Port Office.

The Contractor should obtain these, and any other, permits in a timely fashion to ensure the efficient implementation of the project.

NOTE: the waterway shall be open during the works. At the time of UXO handling, the traffic will be suspended with permission and cooperation of the Prahovo Port Office.



13.2 Commencement Date & Period of Implementation

FORWARNING:

This scope of work is planned to be tendered over the winter months and high water level with additional surveys encompassing a step out component to allow scope adjustment to continue surveying in the direction of any future finds while the investigation is in progress. A works contract instead require execution period for these works require two summer working seasons (18 months from commencement order until provisional acceptance).

Please, refer to the Special Conditions for the actual commencement date and period of implementation.



14 REPORTS

14.1 Reporting requirements

With the exception mentioned below, all reports shall be submitted in English.

The draft final report and the final report which should address each of the identified tasks, must be translated into Serbian.

14.2 Submission & approval of progress reports

An electronic version, together with one paper copy, of each progress reports referred to above must be submitted to the DEU Project Manager identified in the contract. The progress reports must be written in English and laid out in a professional manner. The DEU Project Manager is responsible for approving the progress reports. Copies must be circulated to all stakeholders.

The final report, together with all technical documentation, will be submitted as follows:

- Paper Copies: 4
- DVD: 10

15 MONITORING AND EVALUATION

15.1 Definition of indicators

Monitoring indicators will be proposed in the Organisation and Methodology and will be agreed in the Inception report.

The project can be monitored and evaluated at any time by the EUD internal monitors and / or external monitors / evaluators appointed by EUD.

This project will be subject to technical evaluation at several stages to ensure it is achieving the desired outputs in a technically valid manner.

15.2 Special requirements

The defect notification period is not applicable for this project.

Appendixes

- I. Logframe
- II. IWT observations on the Port of Prahovo
- III. Indicative permit and accreditation requirements
- IV. Technical description of the project location
- V. Requirements and conditions by Mine Action Center of Serbia
- VI. Schedule of depth of ferro-magnetic anomalies
- VII. Supervisor's responsibilities
- VIII. Technical description of bombs
- IX. Personnel qualifications



APPENDIX I: LOGFRAME

LOGFRAME PLANNING MATRIX (From Project Fiche IPA 2010)		Programme name and number	
PROJECT NAME: SEARCH AND RECOVERY OF UXO FROM THE DANUBE RIVER BED OF THE NAVIGATION FAIRWAY AND SUPERVISION OF THE PROJECT		Contracting period expires 2 years after signing of Financing Agreement	Disbursement period expires 5 years after signing of Financing Agreement
Overall objective	Objectively verifiable indicators	Sources of Verification	
Develop the full potential and the competitiveness of Serbia's inland waterway transport sector for socio-economic development, in particular in the Danube basin	Number of cargo & passengers vessels recorded using Serbian reaches of the Danube Vessels and convoys passage time through this river stretch decreased as well as risk of accidents. Positive reports of the Danube Commission		
Project purpose	Objectively verifiable indicators	Sources of Verification	Assumptions
To remove identified UXOs within the most priority areas ¹³ and conduct an efficient and effective supervision of their removal from the fairway in accordance with international regulations and standards.	Impact indicator: Navigational safety improved along the Serbian reaches of the Danube Risk of accidental explosion of UXO removed from tackled areas.		

¹³ Areas will be selected by Mine Action Centre, Plovput and Ministry of Infrastructure. Those locations will be verified by the Project.



Results	Objectively verifiable indicators	Sources of Verification	Assumptions
<p>1 Navigation conditions in the Prahovo port and in other selected areas along Corridor VII in lined with Danube Commission's requirements and international standards.</p> <p>2. Supervision of UXO removal activities in accordance with national and professional standards have been carried out successfully.</p>	<p>1.1 Gradual increase of Waterway Transport traffic volume up to 20% in 2025</p> <p>1.2 UXO critical locations in the fairway are cleaned between 80-100%</p> <p>1.3 Decreased water pollution level in the areas tackled with the project.</p> <p>1.4 Improved IWT transport conditions and transport savings</p> <p>2.1 Survey and Supervision time schedule adhered to work carried out according to technical specifications</p> <p>2.2 Number of ordnance, including a number of suspected tomahawks, collected and disposed of safely according to best engineering and environmental practice</p>	<p>Contractor reports, Plovput reports, Danube commission reports</p>	



Activities	Means & Costs	Assumptions
<p>Activities related to result 1:</p> <p>1.1 To conduct comprehensive assessment of the preliminary results achieved by the running survey in order to get all necessary information by magnetic borehole detection accompanied by Geo-radar and CPT-measurements in preparation of a safe and effective recovery process.</p> <p>1.2. Identification of the concept of a safe recovery, defusing and disposal of UXO.</p>	<p>Works contract for removal of UXO</p> <p>Service contract for supervision of removal</p>	



<p>Activities related to result 2:</p> <p>2.1. Supervision of safe disposal of UXO and any contaminated material in line with good engineering & environmental practice</p> <p>2.2. Quality assessment of the work performed with additional survey in order to certify the absence of UXO on all suspicious areas.</p> <p>2.3. Coordination with other Serbian authorities (Ministry of Infrastructures, Mine Action Centre of the Republic of Serbia - MAC, Directorate for Inland Waterways - Plovput, Ministry of Environment & Spatial Planning)</p>		
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Pre-conditions: Completion of UXO survey.



APPENDIX II: IWT MASTER PLAN PARAPHRASE OF THE OBSERVATIONS ON THE PORT OF PRAHOVO

At Prahovo, near the Djerdap dam II, a number of vessels were scuttled and sunk at the end of the World War II; these interfere with shipping during periods of low water. The exact number of vessels is unknown, available information reveals that about 20 wrecks are present in the fairway. No information is available about the cargo of the vessels; further, there is a risk that they may contain unexploded ordnances (UXO) and other UXO may lie in the vicinity of these vessels. Therefore, although any collision with wrecks is hazardous, the risk is substantial not only to navigation but also to anchoring vessels. The level of risk is likely to increase given the forecasted increase of shipping. Moreover, there are ecological considerations because the river bed around the sunken vessels is a natural spawning area for sturgeon (*Acipenser gueldenstaedti*) Beluga (*Huso huso*); their season is from 1st March to 30th September. In summary, a detailed environmental assessment of how to remove the sunken vessels requires additional investigations and surveys.

The Serbian Institute of Nature stipulates that all interventions are forbidden in the fish hatching period. This is particularly relevant during the removal of sunken vessels from Danube, as the river bed around them is a sturgeon spawning area.

This appears to leave only the period between October and February for vessel removal. Therefore, a more detailed assessment is required to determine the overlap between the site of wrecks, the location of UXO and the active spawning areas. In particular, more information is needed concerning the:

- exact location of the ships and/or UXO;
- occurrence of UXO and their typology;
- sediment type and quality (e.g. content of pollutants) at these locations;
- technical description of how the vessel/ UXO is intended to be removed (alternative methods);
- description of type of cargo in the ships; and
- condition and content of the fuel tanks.

This detailed survey is important because leaving the sunken vessels in the river constitutes an environmental risk; there are two broad categories of risk:

- the removal of the sunken vessels will constitute a risk if UXOs explode; and
- leakage of dangerous cargo, oil and fuel may occur.

In addition polluted substances from sediment may be mobilised during the removal operation. A controlled and careful planned and executed removal operation may reduce the risks for human health and the environment.

The IWT Master Plan did not carry out a full EIA due to the lack of detailed information; however, an initial environmental assessment found that there is a risk of collision between vessels plying that section of the Danube and the sunken vessels, which is most pronounced during periods of low water levels. Any collision may result in an explosion of UXOs which may cause loss of human life and or severe injuries to crew onboard the ships. It may also with or without explosion of UXOs – result in spreading of environmental harmful and hazardous substances into the environment. The sunken vessels (ship wrecks) are an environmental hazard, even if no collision occurs. Corrosion is also a hazard as leakage of hazardous or otherwise harmful substances, such as fuel and oils, pose a threat to the environment.

The salvage and removal of the ship wrecks, and / or UXO must be conducted in a controlled manner to mitigate the risks; due care is needed to minimise any suspension of polluted sediment and the mobilisation of polluted substances.

APPENDIX III INDICATIVE PERMITS AND ACCREDITATION REQUIREMENTS PREPARATION WORK

A. Residency (White Card)

01. As soon as an expatriate enters the country (within 24 hours), s/he must register with the Ministry of Interior at their local Municipal police station:

- ✓ When staying in a hotel, an expatriate will automatically be registered by that hotel.
- ✓ When renting an apartment or staying with someone, the landlord / person who s/he is staying with should accompany the expatriate to the Municipal police station and start the registration process (obtaining the so-called White Card).

02. Within 3 days of arrival in the country the applicant must apply for a residence or business permit with the Expatriates Police Office. The following documents are required:

- ✓ Valid passport
- ✓ CV or resume translated into Serbian
- ✓ Registration of the apartment where the foreigner is staying (White Card) issued by the Municipal police station
- ✓ Copy of Employment contract (in Serbian stating that employment is starting after obtaining residence in Serbia)
- ✓ Explanatory letter on the company's letterhead of their need for the expatriate's employment (in Serbian verified by court interpreter (notarised) stating that employment is starting after obtaining residence in Serbia and how long ,it will last, the expatriate's job description, whether the expatriate is receiving the salary locally or abroad)
- ✓ Application form
- ✓ Two recent photographs (dimensions 40 mm x 30 mm)
- ✓ Proof of paying the Republic Administrative Fee (175 dinars)""
- ✓ Proof of paying the Republic Administrative Fee for issuing of Work Visa (11,000 dinars)

03. After the request has been submitted, it takes the EPO a month approve the permit, which is then issued within 3 days. During this period the applicant should prepare any other necessary documentation. The procedures for obtaining specific permits are described under separate headings. The permit may have duration of either 6 months or a year.

B. Renewal

04. Once the initial 6 months expires, an expatriate may renew his/her business / residence and work permit. However, it is necessary to apply 30 days prior to the permits expiry date. The renewal process takes approximately two weeks.

05. The Contractor is responsible for obtaining the necessary permits and licenses to execute the project. The Contractor must follow the rules, regulations and procedures set out by the competent local authorities and the Serbian Mine Action Centre (MAC). Failure to do might result in cancellation of the project.

C. Accreditation to conduct UXO works (see MAC letter Appendix V)

D. Site access permits (see MAC letter Appendix V)

E. Other Permits

06. The company should be also be aware of the need for other licences / permits; these might include:

- ✓ Environmental permits covering both work in the Danube during the spawning season and building / construction permits that might be applicable,
- ✓ Health & safety Certificates covering the operations,
- ✓ Waste disposal licences permitting the disposal of any material / sediment excavated during the investigations and removal,

- ✓ Strategic Environmental Assessment and Environmental Impact Assessment if deemed necessary.

07. Application for these permits should be made to the Ministry of Environment and Spatial Planning, or any other institution or agency as appropriate.

08. According to regulations covering the procurement and transportation of explosives, foreign legal entities cannot procure and transport explosives in Serbia (Official Gazette Republic of Serbia no. 43/94); therefore, foreign legal entities which are to be elected for the Contractors should enter into a contract with an authorized Serbian legal entity for any necessary procurement and delivery of explosive needed for UXO destruction.

09. The regulation of scientific and other surveys important for defence of the country and procedure for granting permission for conducting these surveys together with the foreigners or for the need of foreigners (Official Gazette Republic of Serbia no.54/94, page 750) states that state institutions, companies and other legal persons performing scientific surveys in areas important for the defence of the country on the territory of Republic of Serbia can perform those surveys together with expatriates or for their needs(purposes), or in cooperation with expatriates, only if they provided the permission beforehand from the Ministry of Defence. According to this regulation's article 9 the Contractor must apply for issuing of such permission from the Ministry of Defence minimum 60 days prior start of the execution works. The Ministry of Defence is obliged to make the decision within 30 days from the day of applying. Therefore, the whole procedure must be started 90 days prior to works starting; it is therefore critical to have adequate time to conduct these matters during the mobilisation period.

10. Work Permits necessary precondition that must be obtained prior to the start of any activity on site. These permits must be applied for together with a Traffic Safety Plan at the Site Captains of the specific river part, the municipalities, the Border Police etc. These stakeholders should be verified with MAC before commencement of the project, but indicatively for the Prahovo site (D9) applications should be made to the:

- ✓ Kapetanija Prahovo;
- ✓ Yugopetrol Terminal / Refinery;
- ✓ Border Police; and
- ✓ Ministry of Defence

11. It is estimated that more than 4 weeks are required in order for these permission to be issued.



APPENDIX IV:

TECHNICAL DESCRIPTION OF THE PROJECT LOCATION

A. General

01. This project focuses on a portion of the Prahovo port on the Danube in the east of the Republic of Serbia on the border with Romania. This is an international border and movement restrictions apply. The target area in the Danube is between chainage: 858.00 km to 859.20 km, which is located about 30 km from the town of Negotin. The Djerdap II hydroelectric power plant lies upstream from the Prahovo port at 863 km; its geographic coordinates are: $\varphi = 44^{\circ}14'10''$ N and $\lambda = 22^{\circ}40'24''$ E.

02. Ellipsoid: the geodetic field survey system used in Serbia is the Gauss-Krueger System Bessel Ellipsoid 1841. Additionally all coordinates in the delivered maps will be expressed in UTM-Nord-34 and ETRS 89. According to the maps the UXO-suspicious points and areas has to be mapped and marked during survey and recovery activities. The accuracy of the perimeters of the areas must be within ± 0.1 m.

03. In 1999 the NATO Air Force attacked a number of Serbian targets, which included the State Oil Storage (now Yugopetrol) and artificial fertilizer unloading terminals; the attacks destroyed the mazout (low grade residual fuel) station and the electrical transformer station. Storage tanks were also destroyed.

04. These targets were repeatedly attacked; it is estimated from reports and observers that 20 missiles fell in this area and a further 50 in the wider port area, many did not explode. As a result, the entire area is contaminated, not only with UXO but with artificial fertilizer products. The resultant pollution has a continuing hazardous impact on human health and the environment.

05. The port area is full of inflammable and other hazardous matters. Therefore, the search activities have to be carefully planned and adjusted to the port conditions.

B. Search area

06. An underwater survey of the river was conducted in 2008/09 between chainage 858.00 km to 859.20 km with a width of 200m measured from the Serbian bank. The land area has a length of 700m and is 10m wide, totalling 7,000 m². The total area was 247,000 m². The search depth is 3 meters below the river bottom and the port basin level. The river bottom is to be searched up to borderline with Romania, i.e. the river centre line. The river cross sections are presented in the drawings part (volume 5). With the previous SSS 2008/09 contract the area has not been surveyed completely due to strong current and other problems. A stretch of a width of about 100 m and a length of about 1200 m totalling to about 81,000 m² (area within the yellow line in the attached drawing) must be resurveyed with a magnetic surface detection of the riverbed again.

07. The area has a number of important characteristics particularly due to a variable water depth ranging between 1 to 10m. The water levels vary according to the oscillations resulting from the operating regime of the Djerdap II hydroelectric power station. During the survey, water velocity varied between 1 and 8 km/h. Turbidity is high and visibility is low due to presence of sediment and low water temperatures; the water quality class is between II - III.

08. The river bottom is mainly sand, but it also contains gravel; there are also wrecks from vessels sunk or scuttled at the end of the World War II. The hydrology of the river at this point has resulted in sediment deposits, that have increased the depth of the river bed and successional vegetation has colonised the bed.

09. In the summer the area is invaded by mosquitoes and other insects which pose a threat to human health. Also, this part of the Danube is spawning ground, notably for sturgeon (*Acipenser gueldenstaedti*) Beluga (*Huso huso*), but also for the Danube salmon (*Hucho hucho*).

10. Available information suggests that service and utility infrastructure do not pass under or through the Danube at this appoint. There are some utility services onshore at the port and along the littoral. This should be confirmed with the relevant authorities.

11. The port area is full of inflammable and other hazardous matters. Therefore, the search activities have to be carefully planned and executed, taking into account to prevailing conditions and circumstances.

12. In the Port of Prahovo facilities for berthing and loading vessels are available; however prior approval from the port authorities is essential. Information about the process and procedures is available at: <http://www.danubeports.info/index.php?id=1266>.

13. Recent information about the water level in this reach of the Danube is available from the Hydrometriological Institute of Serbia's website, which is available at: <http://www.hidmet.gov.rs/eng/hidrologija/radio.php>.

14. Therefore, when planning the project activities the Contractor must take into account these river conditions and factors, which make it difficult to operate survey equipment¹⁴.

C. Vessel movements

15. This reach of the Danube is on the only section of the river the International Danube Commission has not issued standing navigation instructions; the chart for this reach of the river is blank. This is a very hazardous area for navigation, due not only to the presence of UXO but also to the presence of wrecks and the fluctuating water levels. Vessels plying this reach are in mandatory contact with the Port Authority; pilots are not available to assist in navigation.

16. Approximately two vessels, with attending barges sail through the port each hour. There are seasonal variations, data for 2008 are shown in the following table:

Month	Motorised vessels		Barges	
	Serbian channel	Romanian channel	Serbian channel	Romanian channel
January	96	88	365	352
February	151	163	609	489
March	206	186	788	744
April	166	128	640	448
May	89	125	285	500
June	406	86	2,083	430
July	448	110	1,345	410
August	458	106	1,444	426
September	306	145	963	435
October	95	104	348	364
November	141	162	532	648
December	175	201	711	946
Totals	2,737	1,604	10,086	6,192

17. Therefore, all survey, engineering and neutralisation or defusing and removal activities must be agreed and approved of in advance. All work plans must take into the congested nature of the reach, particularly as an anchorage for the Yugopetrol oil terminal is within the survey area.

¹⁴ Such as sounders, submerged vessels, remote controlled equipment and underwater cameras.



APPENDIX V: REQUIREMENTS AND CONDITIONS BY MINE ACTION CENTER OF SERBIA



REPUBLIC OF SERBIA
MINE ACTION CENTRE
11050 Belgrade, Vojvode Toze 31
Tel. ++381 11 30 45 280 - Fax ++381 11 30 45 281
E-mail: czrs@eunet.rs
Belgrade, 11 January 2010

TERMS FOR GRANTING ACCREDITATION FOR CONDUCTING HUMANITARIAN DEMINING IN THE TERRITORY OF THE REPUBLIC OF SERBIA

Mine Action Centre, according to Article 39 of the Law on Ministries (the Official Gazette of the Republic of Serbia, No. 65/08), will grant accreditation for conducting humanitarian demining to companies and other organizations which have been registered, are technically equipped and have suitably qualified personnel for conducting humanitarian demining operations in the territory of the Republic of Serbia, if along with a request for issuing an accreditation they submit proofs that they fulfil the stated terms.

Accreditation by the Mine Action Centre requires the following documentation:

1. Request for granting accreditation for conducting humanitarian demining in the territory of the Republic of Serbia;
2. Proof of paying the Republic Administrative Fee for granting accreditation for humanitarian demining;
Payment Instructions include:
 - Payer: The name of the company which pays the fee;
 - Purpose of payment: the Republic administrative fee;
 - Receiver: Budget of Republic of Serbia;
 - Amount: 750 dinars;
 - Receiver's account: 840-742221843-57;
 - Number of model: 97;
 - Invitation to number: 41-019
 -
3. Proof of registration of the company or other organization (notarised / certified copy):
4. Standard Operational Procedures (SOP) for each area of humanitarian demining for which accreditation is requested (i.e. for demining of minefields, for demining-clearance of land and objects of cluster munitions and other unexploded ordnance, and for underwater demining);
5. Structure of the company or organization (schematic diagram);
6. List of employees working on the project;

7. Notarised copy of a proof of adequate competence of pyrotechnicians-deminers for conducting humanitarian demining from the field of demining for which accreditation is requested (certificates, diplomas, etc.);

For underwater demining a proof of competence of divers for underwater demining, where in one group – team of divers – deminers at least one has to be a pyrotechnician – deminer certified as a diving instructor.

8. References - a brief history of operations of humanitarian demining from the field of demining for which accreditation is requested carried out in the past by certain company or organization;

9. Statement of safety policy;

10. Statement of quality assurance;

11. Statement of insurance policy for employees in case of accident;

12. Statement of insurance policy for damages to third parties;

13. List, serial number, brand and type of a detector to be used (detectors are subject to verification - testing on the field where the works will be conducted);

14. List, serial number and name of producer of protection equipment for deminers (protection jacket, helmet with a visor), as well as list and name of producer of diving equipment for divers – deminers, with proof of their validity, i.e. expiration date (notarised copy of a guarantee or an attestation if the equipment is not within guarantee period).

Copies of the documents under the Nos. 3, 7 and 14 should be notarised in a municipality or a court in the Republic of Serbia.



NOTE

The company or organization which is to be selected to carry out demining operations is required to submit no later than 15 days before the beginning of operations to the Mine Action Centre the following:

1. Records of employees to be engaged in the implementation of the Project showing:
 - name and surname
 - name of one parent
 - date, month and year of birth
 - place and country of birth
 - occupation, i.e. title (title of post)
 - citizenship
 - type and number of identity card, and for foreign citizens number of passport with expiry date and name of issuing authority.
2. Records of vehicles to be used in the implementation of the Project, including:
 - license plate
 - make and type
 - the production year
 - number of insurance policy and expiry date (green card for vehicles registered abroad) and
 - name of the owner
7. Records of the place of temporary stay, i.e. the accommodation during project implementation, including:
 - the name of a hotel, motel or other object where the employees are to be accommodated
 - the name and address of the owner of the object where the employees are to be accommodated
8. Records of equipment to be used in the implementation of the Project, including:
 - name (make and type)
 - quantity (number of items)

Please note that:

- according to regulations by which the procurement and transportation of explosives in Serbia is regulated, foreign companies or other organizations cannot procure and transport explosives in Serbia. Also, they cannot transport UXO from the site where they were found to the place determined for destruction of the UXO;
- foreign companies or other organizations which are to be elected for the contractors should sign the contract with authorized legal entity in Serbia according to their own choice about transport and destruction of UXO.

Next to mentioned, foreign companies or other organizations which are to be elected for the contractors should resolve the issue of temporary import of tools and equipment which is to be used in demining. We recommend that before importing, they get information at the customs authorities of the Republic of Serbia about the terms of temporary import of equipment.

It is also needed that the representatives of foreign companies or other organizations get the information about visas at diplomatic and consular sections of Serbia abroad and with the authorized police authorities about the terms of regulation of temporary residence.



APPENDIX VI: MAGNETIC ANOMALIES INFORMATIONS AND TARGETS

Schedule of depth of ferro-magnetic anomalies

Estimated depth (metres) below riverbed of anomalies larger than 75 litres in volume									
	<2	2-3	3-4	4-5	5-6	6-7	7-8	>8	Total
Anomalies	81	11	14	11	2	3	1	5	128
	63.3%	8.6%	10.9%	8.6%	1.6%	2.3%	0.8%	3.9%	
Cummulative total	81	92	106	117	119	122	123	128	
	63.3%	71.9%	82.8%	91.4%	93.0%	95.3%	96.1%	100.0%	
	36.7%	28.1%	17.2%	8.6%	7.0%	4.7%	3.9%	0.0%	

Sequence of survey activities PRAHOVO

During the survey in 2008/2009 anomalies suspicious to be UXO and embedded in the riverbed had been identified according to the following table with one or more of the following methods: multibeam, side-scan, sub-bottom profiler and Caesium-Vapour-Magnetometer. On the area surveyed by magnetometers ± 142 objects with a “magnetic” Volume bigger than 15 l were found. The depth of the anomalies has been calculated during data processing with the magnetic software DATALINE.

Depth	Up to 2 m	2-3 m	3-4 m	4-5 m	5-6 m	6-7 m	7-8 m	deeper
Quantity	93	13	13	12	2	3	1	5

After crosschecking of the results with multibeam, side-scan and sub-bottom no ferromagnetic anomaly could be excluded at this stage of data assessment by the Survey and Search Contractor. Due to certain restrictions during magnetic data acquisition because of line spacing and the distance between probe and river bed

- the accurate depth, the exact position and the dimensions of these items are not sufficiently known and
- the probability that the items are UXO indeed could not be investigated in more detail.

The preparation of the recovery of UXO needs accurate information regarding depth, dimensions and the position of the targets and the soil conditions. Regarding the probability if those items could be UXO the method of borehole detection can deliver supporting information.

Attachment 3: D9 PRAHOVO - MAGNETOMETER WATER SURVEY

Filter 1 - Volume values over 15 liters and Magnetic moment in [Am2] values over 0.5

Object No.	FDL Depth	Incl.	Decl.	D.Mmt.	Vol.	Local X	Local Y	Line Number	Fish Depth	Distance River floor	Actual Object Depth	Water Depth during Survey
	[m]	[°]	[°]	[Am2]	[l]	[m]	[m]	[n]	[m]	[m]	[m]	[m]
1	3,96	16,20	175,50	734,95	6121,47	629974,79	4905442,31	61	5,21	1,89	-2,07	7,10
2	3,68	1,00	181,20	176,13	1467,02	628822,36	4905618,32	41	1,50	3,94	0,26	5,44
3	7,46	-13,30	359,20	277,15	2308,39	628773,08	4905607,21	36	4,33	3,36	-4,10	7,69
4	7,02	-6,40	28,20	444,72	3704,09	628743,92	4905610,96	35	4,10	3,41	-3,61	7,51
5	3,47	8,40	73,00	272,11	2266,42	628796,24	4905667,6	52	4,50	3,02	-0,45	7,52
6	10,64	-8,50	294,10	650,95	5421,86	628820,82	4905658,88	51	4,38	3,30	-7,34	7,68
7	6,83	-21,10	328,30	424,19	3533,16	628785,97	4905674,02	53	4,21	2,88	-3,95	7,09
8	6,47	2,50	324,90	144,51	1203,65	628847,91	4905637,23	47	4,59	2,43	-4,04	7,02
9	7,04	8,40	39,80	195,54	1628,68	628817,05	4905605,33	38	4,84	2,79	-4,25	7,63
10	5,12	-29,30	290,00	1379,28	11488,21	628858,56	4905612,87	42	4,96	2,24	-2,88	7,20
11	6,05	-16,20	268,00	480,37	4001,08	628883,3	4905618,57	45	4,18	3,02	-3,03	7,20
12	3,9	-28,60	300,10	229,48	1911,35	628902,78	4905587,55	38	5,38	2,53	-1,37	7,91
13	12,56	23,00	221,60	1209,44	10073,56	628950,6	4905596,26	43	5,08	2,67	-9,89	7,75
14	4,94	-20,40	225,10	1091,64	9092,38	628985,82	4905589,81	43	5,21	2,84	-2,10	8,05
15	4,57	-21,00	325,20	66,68	555,37	628985,38	4905651,03	58	3,72	3,24	-1,33	6,96
16	2,54	-36,30	280,10	93,09	775,34	629036,03	4905576,95	43	5,24	1,86	-0,68	7,10



17	1,24	-0,40	52,80	4,66	38,77	628754,98	4905632,35	41	1,46	3,92	2,68	5,38
18	2,53	-34,90	33,80	12,90	107,48	628749,41	4905659,3	47	4,76	2,61	0,08	7,37
19	11,4	16,50	228,40	624,45	5201,08	628751,27	4905675,17	51	4,47	2,61	-8,79	7,08
20	3,74	-11,80	259,90	12,90	107,48	628940,42	4905573,53	37	4,76	2,37	-1,37	7,13
21	9,39	9,10	285,40	857,78	7144,51	629020,33	4905571,19	41	1,41	5,42	-3,97	6,83
22	26,34	3,70	212,40	17017,38	141739,59	629056,13	4905554,1	38	3,93	3,21	-23,13	7,14
23	5,13	6,90	286,30	805,06	6705,42	629050,02	4905571,88	42	4,84	2,26	-2,87	7,10
24	3,9	-5,90	260,50	48,93	407,51	629068,51	4905572,95	44	4,96	2,07	-1,83	7,03
25	13,38	-27,00	98,60	3182,62	26508,40	629088,61	4905570,8	44	4,84	3,10	-10,28	7,94
Object No.	FDL Depth	Incl.	Decl.	D.Mmt.	Vol.	Local X	Local Y	Line Number	Fish Depth	Distance River floor	Actual Object Depth	Water Depth during Survey
26	9,65	21,30	359,00	292,64	2437,41	629130,84	4905619,17	58	3,72	3,68	-5,97	7,40
27	6,04	65,20	227,50	57,34	477,63	629157,96	4905622,12	60	4,55	3,17	-2,87	7,72
28	6,69	15,70	74,40	95,56	795,92	629197,58	4905612,95	60	4,59	2,48	-4,21	7,07
29	8,71	-26,50	206,10	430,96	3589,54	629126,39	4905582,7	49	4,55	2,69	-6,02	7,24
30	2,47	-14,30	87,30	12,26	102,11	629152,62	4905582,99	51	4,50	2,73	0,26	7,23
31	6,74	34,60	143,40	53,87	448,69	629148,34	4905618,32	59	4,50	2,59	-4,15	7,09
32	8,26	15,80	30,40	5425,59	45190,30	629170,22	4905570,25	48	4,47	2,34	-5,92	6,81
33	0,77	-2,00	276,10	1,24	10,30	629167,37	4905531,38	39	5,04	2,10	1,33	7,14
34	3,49	10,60	119,00	13,57	113,04	629202,01	4905533,93	41	5,01	2,19	-1,30	7,20
35	8,53	-10,10	222,20	354,36	2951,47	629193,57	4905566,57	49	4,27	2,47	-6,06	6,74
36	6,39	46,00	235,40	138,04	1149,76	629215,24	4905565,59	50	4,79	2,42	-3,97	7,21
37	5,14	-11,60	93,90	37,24	310,18	629229,05	4905585,24	55	4,55	3,17	-1,97	7,72



38	5,34	-2,90	288,70	122,72	1022,14	629218,18	4905531,22	42	4,96	2,34	-3,00	7,30
39	4,6	-21,60	200,80	495,15	4124,18	629238,6	4905564	51	4,56	2,99	-1,61	7,55
40	5,7	37,70	7,40	42,82	356,64	629255,74	4905606,15	62	4,79	2,25	-3,45	7,04
41	2,86	-23,30	50,00	26,51	220,78	629250,64	4905573,97	54	4,55	2,84	-0,02	7,39
42	1,63	-36,10	105,20	13,57	113,04	629269,42	4905589,37	59	4,70	1,80	0,17	6,50
43	7,05	33,60	147,10	81,37	677,73	629229,75	4905509,58	37	5,21	2,88	-4,17	8,09
44	5,41	15,80	140,00	116,92	973,85	629282,61	4905496,75	37	5,24	2,57	-2,84	7,81
45	2,39	19,40	108,80	16,47	137,19	629290,6	4905515,47	42	4,87	2,70	0,31	7,57
46	1,25	-32,10	237,70	4,33	36,07	629281,34	4905516,64	41	4,92	1,70	0,45	6,62
47	1,82	21,70	152,90	9,35	77,91	629313,81	4905538,29	48	4,27	2,97	1,15	7,24
48	2,94	-25,30	84,60	26,51	220,78	629318,43	4905571,02	57	4,59	2,19	-0,75	6,78
49	5,14	5,70	209,20	141,25	1176,50	629324,77	4905540,87	50	4,50	2,70	-2,44	7,20
50	6,2	42,50	263,90	119,80	997,80	629342,63	4905560,64	55	5,01	1,90	-4,30	6,91
51	16,48	41,50	272,40	1017,52	8475,00	629333,36	4905528,5	47	4,50	2,82	-13,66	7,32
52	1,87	-60,60	329,20	76,97	641,11	629333,02	4905503,93	41	1,46	5,08	3,21	6,54
53	3,72	7,90	104,10	297,93	2481,45	629347,31	4905482,03	37	5,05	2,22	-1,50	7,27
54	6,15	-40,60	18,50	734,95	6121,47	629367,28	4905553,36	55	5,01	2,00	-4,15	7,01
Object No.	FDL Depth	Incl.	Decl.	D.Mmt.	Vol.	Local X	Local Y	Line Number	Fish Depth	Distance River floor	Actual Object Depth	Water Depth during Survey
55	4,85	26,80	222,70	734,95	6121,47	629375,24	4905555,69	56	4,85	2,05	-2,80	6,90
56	2,2	21,80	128,90	18,90	157,40	629333,51	4905494,89	39	4,92	2,67	0,47	7,59
57	0,97	-75,80	272,70	39,96	332,87	629332,7	4905488,78	37	5,21	2,18	1,21	7,39
58	2,49	-53,60	240,80	14,26	118,79	629318,24	4905495,29	38	4,84	2,81	0,32	7,65



59	3,2	17,10	348,20	16,47	137,19	629295,63	4905500,61	38	4,76	2,94	-0,26	7,70
60	1,59	20,00	305,00	4,33	36,07	629373	4905530,32	50	4,42	2,70	1,11	7,12
61	2,98	25,80	257,80	22,49	187,31	629370,89	4905476,84	37	5,08	1,95	-1,03	7,03
62	3,02	8,80	260,60	23,45	195,33	629373,38	4905472,14	36	4,64	2,74	-0,28	7,38
63	2,75	37,50	93,60	9,89	82,41	629383,73	4905501,37	43	5,13	2,16	-0,59	7,29
64	-0,29	27,4	104,6	0,1086	0,9043	629386,08	4905482,66	39	5,08	2,06	2,35	7,14
65	4,26	66,30	58,60	15,71	130,86	629355,47	4905506,43	43	4,96	2,50	-1,76	7,46
66	7,2	13,50	164,30	119,80	997,80	629408,45	4905501,24	45	4,18	3,01	-4,19	7,19
67	7,28	29,90	35,90	88,27	735,25	629414,98	4905525,44	51	4,70	2,79	-4,49	7,49
68	3,01	-11,60	112,00	14,97	124,73	629412,24	4905558,53	59	4,76	2,06	-0,95	6,82
69	5,56	-1,10	101,40	60,97	507,79	629378,72	4905587,96	64	3,18	3,88	-1,68	7,06
70	2,52	67,00	101,90	9,89	82,41	629426,27	4905464,46	37	5,33	1,44	-1,08	6,77
71	2,69	14,40	108,90	24,44	203,59	629430,7	4905483,87	42	4,92	2,08	-0,61	7,00
72	4,7	-5,10	87,00	44,29	368,93	629442,85	4905530,72	54	4,42	2,82	-1,88	7,24
73	1,47	-34,90	89,10	11,03	91,91	629442,95	4905561,56	61	4,59	2,41	0,94	7,00
74	6,7	-12,40	324,00	430,96	3589,54	629445,59	4905453,33	35	3,72	3,40	-3,30	7,12
75	2,66	50,50	106,00	52,19	434,67	629445,32	4905476,04	40	5,16	1,80	-0,86	6,96
76	3,72	31,20	152,00	79,15	659,25	629440,56	4905461,63	37	3,93	3,19	-0,53	7,12
77	4,62	34,00	327,90	28,68	238,92	629458,23	4905532,45	55	5,08	2,27	-2,35	7,35
78	2,31	28,10	36,30	19,76	164,55	629460,73	4905513,16	50	4,01	3,04	0,73	7,05
79	6,08	22,50	154,40	108,57	904,32	629465,78	4905505,9	49	4,47	2,53	-3,55	7,00
80	2,97	36,10	245,90	18,06	150,46	629455,82	4905458,54	37	4,01	3,12	0,15	7,13
81	2,35	-51,70	81,10	372,58	3103,23	629487,4	4905536,1	57	4,90	2,21	-0,14	7,11
82	2,81	9,90	191,60	15,71	130,86	629497,93	4905556,05	63	4,50	2,94	0,13	7,44
83	2,48	12,10	146,30	7,39	61,57	629470,77	4905472,86	41	5,16	1,81	-0,67	6,97



Object No.	FDL Depth	Incl.	Decl.	D.Mmt.	Vol.	Local X	Local Y	Line Number	Fish Depth	Distance River floor	Actual Object Depth	Water Depth during Survey
84	6,74	31,50	128,90	203,69	1696,54	629475,69	4905455,57	37	4,13	2,99	-3,75	7,12
85	2,04	67,30	128,60	19,76	164,55	629480,64	4905458,72	38	3,84	2,23	0,19	6,07
86	2,02	-36,00	98,90	272,11	2266,42	629496,68	4905463,62	40	5,30	1,75	-0,27	7,05
87	3,16	2,50	94,50	147,82	1231,21	629496,65	4905476,46	43	5,08	1,85	-1,31	6,93
88	4,36	9,50	3,30	154,59	1287,60	629507,44	4905482,49	45	4,18	2,78	-1,58	6,96
89	4,05	-4,10	16,50	103,23	859,85	629525,35	4905492,41	49	4,55	2,26	-1,79	6,81
90	3,42	51,30	112,10	26,51	220,78	629513,67	4905541,57	60	5,50	1,56	-1,86	7,06
91	3,5	2,00	132,30	24,44	203,59	629460,12	4905497,17	46	5,01	2,06	-1,44	7,07
92	2,56	13,40	139,40	172,41	1436,03	629526,5	4905537,79	60	5,53	1,54	-1,02	7,07
93	1	-17,80	102,80	7,85	65,42	629518,68	4905453,35	39	5,16	1,05	0,05	6,21
94	2,91	59,70	174,20	199,59	1662,38	629526,87	4905433,22	34	3,76	3,90	0,99	7,66
95	3,13	28,90	212,00	64,74	539,19	629526,76	4905439,23	36	3,81	3,82	0,69	7,63
96	2,83	25,90	272,70	14,26	118,79	629554,44	4905494,08	51	4,05	3,14	0,31	7,19
97	1,47	-11,50	4,40	12,90	107,48	629563,91	4905516,15	57	4,92	2,14	0,67	7,06
98	1,78	15,10	136,60	8,33	69,42	629571,72	4905517,03	57	4,96	2,04	0,26	7,00
99	4,2	30,60	94,50	60,97	507,79	629565,18	4905492,5	51	3,96	2,93	-1,27	6,89
100	2,99	21,50	201,60	187,61	1562,67	629557,53	4905453,43	41	1,53	4,90	1,91	6,43
101	1,85	50,40	281,00	151,18	1259,19	629572,77	4905448,33	41	1,53	5,04	3,19	6,57
102	3,07	18,50	11,30	32,17	267,95	629576,19	4905469,37	46	4,96	2,31	-0,76	7,27
103	1,46	58,80	117,70	2,47	20,57	629580,46	4905498,84	53	4,67	1,96	0,50	6,63
104	2,12	44,30	322,40	12,26	102,11	629594,76	4905508,71	57	5,50	1,07	-1,05	6,57



105	1,31	15,70	357,70	1,38	11,49	629575,86	4905501,68	54	4,47	2,10	0,79	6,57
106	4,4	37,30	269,50	10,45	87,07	629584,36	4905528,08	61	4,47	2,52	-1,88	6,99
107	1,71	29,10	211,60	16,47	137,19	629637,4	4905447,01	44	5,13	2,09	0,38	7,22
108	6,82	45,20	176,50	168,74	1405,47	629627,83	4905483,48	52	4,55	2,45	-4,37	7,00
109	8,04	3,40	31,40	557,30	4641,83	629644,9	4905490,07	55	4,27	2,02	-6,02	6,29
110	1,1	-51,90	350,90	8,33	69,42	629646,91	4905518,48	62	4,10	1,91	0,81	6,01
111	0,83	40,60	206,70	1,10	9,20	629654,41	4905509,59	60	5,08	1,35	0,52	6,43
112	1,31	14,90	3,80	24,44	203,59	629675,35	4905437,31	44	5,21	1,58	0,27	6,79
Object No.	FDL Depth	Incl.	Decl.	D.Mmt.	Vol.	Local X	Local Y	Line Number	Fish Depth	Distance River floor	Actual Object Depth	Water Depth during Survey
113	4,82	25,10	75,90	90,66	755,12	629682,21	4905511,34	62	3,96	2,53	-2,29	6,49
114	2,57	5,20	154,80	14,26	118,79	629697,12	4905487,53	57	4,92	1,78	-0,79	6,70
115	3,39	34,90	218,70	18,90	157,40	629682,58	4905412,72	38	4,67	2,60	-0,79	7,27
116	5,09	36,40	64,00	35,93	299,24	629701,77	4905453,35	49	5,04	1,32	-3,77	6,36
117	1,8	54,60	213,60	292,64	2437,41	629721,03	4905480,83	57	5,05	1,62	-0,18	6,67
118	7,5	28,90	118,40	541,30	4508,58	629747,24	4905506,86	64	3,61	3,27	-4,23	6,88
119	1,82	-0,60	4,00	21,55	179,50	629729,81	4905447,02	49	5,08	1,52	-0,30	6,60
120	1,9	37,00	270,90	5,35	44,58	629742,85	4905444,16	49	5,08	1,71	-0,19	6,79
121	5,35	26,60	78,90	66,68	555,37	629760,51	4905454,58	52	4,59	2,24	-3,11	6,83
122	1,77	-3,80	310,40	10,45	87,07	629781,65	4905465,04	56	4,84	1,88	0,11	6,72
123	4,44	17,30	52,50	74,83	623,30	629787,66	4905457,9	55	4,33	2,38	-2,06	6,71
124	1,82	30,60	28,30	9,35	77,91	629795,57	4905469,56	58	4,96	1,66	-0,16	6,62
125	3,21	4,30	315,40	17,26	143,72	629804,6	4905478,63	61	4,96	1,78	-1,43	6,74



126	3,12	7,20	118,70	158,05	1316,42	629786,06	4905428,66	47	3,93	3,04	-0,08	6,97
127	1,12	-50,60	127,60	25,46	212,07	629807,59	4905425,94	48	5,01	1,95	0,83	6,96
128	1,52	16,20	108,90	15,71	130,86	629817,65	4905428,03	49	4,96	2,06	0,54	7,02
129	2,91	2,40	130,40	191,55	1595,45	629822,12	4905464,74	58	4,96	1,77	-1,14	6,73
130	2,4	0,40	263,20	18,90	157,40	629837,18	4905467,67	60	4,59	2,24	-0,16	6,83
131	2,79	-5,40	0,50	35,93	299,24	629845,09	4905450,73	56	4,87	2,37	-0,42	7,24
132	1,21	-46,40	90,20	41,38	344,62	629838,79	4905403,6	44	5,41	1,17	-0,04	6,58
133	3,35	10,40	25,20	34,64	288,55	629852,74	4905424,86	50	4,79	2,08	-1,27	6,87
134	4,25	27,50	106,20	331,00	2756,93	629864,89	4905429,18	52	4,56	2,69	-1,56	7,25
135	2,57	-1,60	326,00	93,09	775,34	629862,66	4905391,11	42	4,64	1,76	-0,81	6,40
136	4,09	12,20	125,40	79,15	659,25	629867,98	4905445,92	56	4,79	2,58	-1,51	7,37
137	5,28	-11,00	54,50	114,09	950,29	629880,86	4905448,31	57	5,03	2,20	-3,08	7,23
138	6,72	34,10	16,10	212,06	1766,25	629894,25	4905466,59	63	4,42	2,95	-3,77	7,37
139	1,33	-5,30	195,50	29,82	248,35	629909,95	4905420,71	52	4,87	2,67	1,34	7,54
140	2,54	-20,40	125,40	60,97	507,79	629936,43	4905410,13	51	4,67	2,19	-0,35	6,86
141	1,44	11,90	89,80	18,90	157,40	629977,05	4905397,79	50	4,47	2,17	0,73	6,64
142	2,34	75,10	109,80	37,24	310,18	629987,9	4905350,46	39	4,92	2,77	0,43	7,69



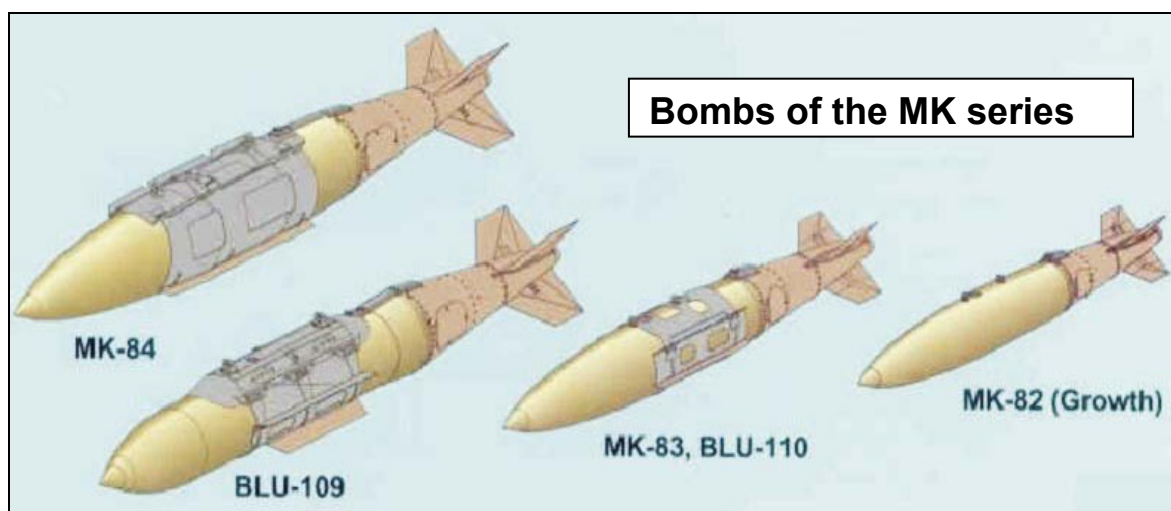
APPENDIX VII: SUPERVISOR'S RESPONSIBILITIES

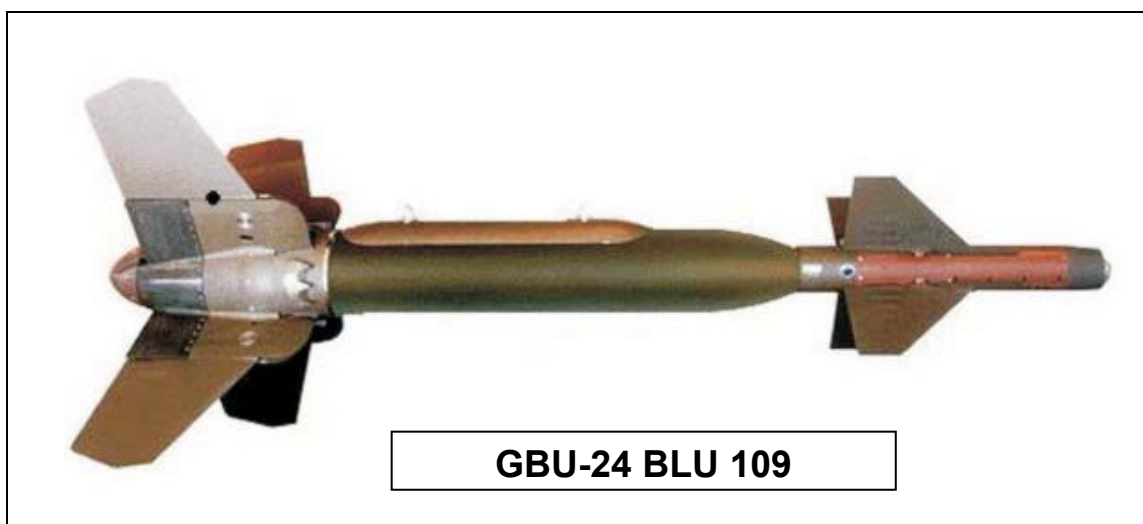
Description	MAC / Plovput / Port Authority		ECD (the Client)	
	Information only	Written Approval	Information (if requested)	Written Approval
Project Manager and PM's Representative	X			
Sub-Contracting		X	X	
Supply of Documents		X		
Superintendence of the UXO removal		X	X	
Performance Guarantee		X	X	
Insurance		X	X	
Performance / Works Programme, Registers & logs	X		X	
Contractors Drawings (engineering drawings for sheet piling work and UXO removal)	X		X	
Environmental, Exceptional Risks & Health Safety (Procedures, protocols and work plans to be agreed with authorities in advance)	X		X	
Security of Sites (OCF and wharfs, jetties & piers, piling sites, etc.) – to include navigation and safety signage and lighting	X		X	
Temporary Works (including OCF and wharfs, jetties & piers, piling sites, etc.)		X		
Overlapping Contracts		X	X	
Extension of Period of Performance		X	X	X ¹⁵
Variations and Modifications		X	X	X ¹
Suspension of works	X		X	X ¹
Suspension, addition of contract price		X	X	X ¹
Quality of Works and Materials (including survey charts & piling works)	X			
Inspection and Testing (engineering / sheet piling structures), Clearance Certificates etc.	X			
Final Statement of Account		X	X	
Claims for Additional Payment		X	X	
Partial Acceptance		X	X	
Provisional Acceptance		X	X	
Final Acceptance		X	X	
Breach of Contract		X	X	

¹⁵ Only if there is an impact on the Supervision Contract

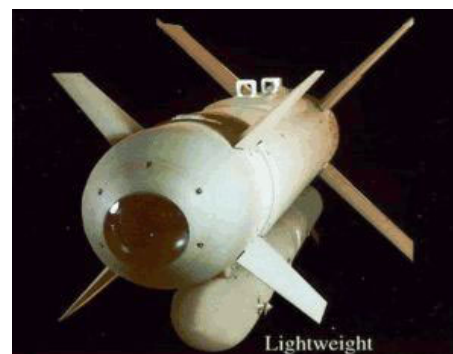
APPENDIX VIII: TECHNICAL DESCRIPTION OF BOMBS

Examples of bombs and rockets used during the NATO air attack in 1999





BGM-109 Tomahawk (3200 lbs)



AGM-130A (429 kg)

Technical description of MK 84

The MK 84 is a free-fall, non-guided GP 2.000 pound bomb. The MK 80-series Low Drag General Purpose (LDGP), bombs is used in the majority of bombing operations where maximum blast and explosive effects are desired. LDGP bombs are designed to be aerodynamically streamlined. Their cases are relatively light, and approximately 45 percent of their complete weight are explosive. General Purpose bombs may use both nose and tail fuses and conical or retarded tail fins. Normal fuses are the mechanical M904 nose fuse and the M905 tail fuse.

The specifications are as follows:

Table 1 MK 84, Specifications

Class	2,000 lb. General Purpose Bomb/Fragmentation
Guidance	Ballistic
Weight	2039 lbs.
Length	129 in.
Diameter	18 in.
Explosive	945 lbs. H-6 or Tritonal
Fuse	Variety of mechanical or electrical

Technical specification shown in Tables 2 & 3, is for explosive load of 945 lbs of H-6 or Tritonal. This corresponds to 428,6 kg. No information on H-6 could be found, but Tritonal is 80% TNT and 20 % Al. The density can be calculated to 1.82 g/cm³. The detonation velocity of Tritonal is assessed to 7000 m/s and the energy content is probably high due to the aluminium.

Table 2.

Type	GBU-10A	GBU-10A/B	GBU-10G/B	GBU-10H/B	GBU-10J/B	GBU-27B	GBU-31	AGM-130A	AGM-130C
Warhead	Mk84	Mk84	BLU-109/B	BLU-109/B	BLU-109/B	BLU-109/B	BLU-109/B	Mk84	BLU-109/B
Explosive fill kg	429	429	251	251	251	251	251	429	251

Table 3. Fuse system

No.	type	warhead	Fyse type
24	GBU-10	Mk 84 / BLU-109	Delayed / impact
2	GBU-27	Mk 84 / BLU-109	Delayed / impact
8	GBU-31	BLU-109	Delayed / impact
10	AGM-130	BLU-109	Delayed / impact



Technical description of BLU-109

<http://ordatamines.maic.jmu.edu/displaydata.aspx?OrDataId=230>

See AGM 130A: <http://ordatamines.maic.jmu.edu/displaydata.aspx?OrDataId=7415>

The BLU series bomb bodies use PBNX-109 as explosive filler. The BLU-109A/B used with the GBU-24 and GBU-31(V)4/B is a special purpose bomb comprised of steel alloy used for hardened targets (no uranium). The BLU-109/B (I-2000) is an improved 2,000 pound class bomb designed as a penetrator without a nose fuse well. Its configuration is relatively slim, and its skin is much harder than that of the standard MK 84 bomb. The skin is a single-piece, forged warhead casing of one inch, high-grade steel. Its usual tail fuse is the mechanical-electrical FMU-143. The 1,925 pound bomb has a 550 pound Tritonal high-explosive blast warhead. The BLU-109/B was always mated with a laser guidance kit to form a laser-guided bomb. The specifications are as follows:

Class	2,000 lb. Penetrator, Blast/Fragmentation
Guidance	Ballistic
Control	Low Drag Fins/Air Foil Groups
Weight (lbs.)	1950
Length (in.)	98.54
Diameter (in.)	14.5
Explosive	535 lbs. Tritonal
Fuze	FMU-143 Series
Stabilizer	Fins and Airfoil Groups (Laser Guided Bombs)

The specifications show an explosive load of 535 lbs. Tritonal. This corresponds to 242,9 kg Tritonal. Which specific model of the individual weapons used by NATO is not known.

Technical description of GBU-27 and GBU-28 Penetrating Air Bombs

<http://ordatamines.maic.jmu.edu/displaydata.aspx?OrDataId=357>

<http://ordatamines.maic.jmu.edu/displaydata.aspx?OrDataId=358>

The GBU-27 (Figure 3) and GBU-28 (Figure 4) bombs are two new laser-guided penetrating air bombs, construed for destruction of strongly fortified control and communication centers located deep underground. Their existence was revealed during the Gulf War (Desert Storm), in 1991.

The first of those bombs originated from the Paveway III laser-guided bomb, variant GBU-24A/B. The new bomb was marked GBU-27A/B, and it was constructed so as to be carried on a F-117A aircraft. The major modifications carried out on GBU-27 are shorter adapter rings; the tail part was overtaken from the bomb Paveway II, variant GBU-10, as well as the extending control flaps. Among other improvements, it is worth mentioning the utilization of the materials which absorb the radar radiation. As a result of these modifications, GBU-27 reach is inferior to that of GBU-24, but that is insignificant because GBU-27 may be launched from higher up, with the same or increased accuracy. The warhead of this bomb still consists of classic free fall penetrating air bomb BLU-109.

Development of the GBU-28 bomb started immediately prior to commencement of air campaign in the Gulf War, and it was initiated urgently upon request of the United States Air Force (USAF) for a bomb which would be able to penetrate and destroy strongly fortified targets, such as control and communication bunkers. The bomb is construed so as to extend the modified



explosive-filled artillery (howitzer) pipe of 200mm calibre (which acts as a warhead) by a modified part for guidance and control from the GBU-27 bomb and fuse system taken from the penetrating bomb BLU-109. Further to the reports, only 17 days elapsed from issuance of order to delivery of the first bombs. Out of the first series (30 pieces), only four of these bombs were used in the Gulf War, two for testing purposes and two were ejected from an aircraft F-111F to the bunker complex of the air force base Al Taji, nearby Baghdad. During the Gulf War, the warhead was marked BLU-109 Special, until later registration as BLU-113. After the Gulf War, this bomb was subject to further tests in the air force base Eglin in Florida, concerning the possibility of its integration to the aircraft F-15, and six bombs were used in fragmentation tests.

In 1993, USAF approved of the funds for further improvements of the GBU-28 bomb performance. That improvement reflects in higher penetrability and fragment effects. A new fuse was also produced, specially construed for penetration bombs, called Hard Target Smart Fuse (HTSM), and integrated to GBU-28. Further to the 1995 reports, USAF completed tests of the advanced version of GBU-28, and it can be born by aircrafts F-15E, F-111F, B-1B and B-2 (8 pcs.). Pursuant to the proposal made in 1996, additional integration of new components to GBU-28 is planned, which would enable GPS (Global navigation system) guidance, as well as integration of additional flaps at the mid body of the bomb, for achieving an advanced reach.

Tactical-Technical Data

Parameters	Air bomb type	
	GBU-27	GBU-28
Length	4.240	5.800
Body diameter (mm)	370	370
Flap span (mm)	720/1.680	72/1680
Bomb mass (kg)		2.130
Explosive mass (kg)	240	300
Type of explosive	Tritonal	Tritonal
Warhead	Penetrating	Penetrating
Reach (km)		9-10
Guidance system	Passive laser	Passive laser
Fuse	Inertia FMU-143/B	Inertia FMU-143D2/B
Drive	None	None

Composition and description of bombs GBU-27 and GBU-28

The GBU-27 and GBU-28 bombs consist of three easily detachable main sections, namely: guidance and control section, warhead section with fuse, and stabilization section at the rear parts of the bombs.

The section for laser guidance and control, similar for both bombs, is a cylindrical pipe made of light metals, with a transparent plastic hemisphere at the front beyond which, within the pipe, there is an assembly of laser radiation detectors within the receiver of the laser reflection. Four



cross-shaped movable overlapping deltoid control flaps are located at the back of the pipe. On the GBU-27 bomb there are integrated the guidance systems WGU-25/B, WGU-25A/B and WGU-39/B, and on the GBU-28 the fuse WGU-36/B.

The GBU-28 bomb uses the penetration bomb BLU-109 for warhead, whereas for the warhead of GBU-28 bomb the penetrating bomb National Forge BLU-113 with reinforced top is used. On the upper part of the bomb, there are hooks for suspension of bombs to standard bomb-carriers at the spacing of 762 mm. The fuses anticipated for use on GBU-27 and GBU-28 are FMU-143/B or FMU-143(D)/B. They are located in the rear of the warhead and used together with initiator FZU-32/B, located on the bomb body between the hooks. This fuse system is overtaken from the bomb BLU-109.

The stabilization section, located on the rear part of the bomb, consists of four fixed extractable flaps used only for the bomb stabilization during the flight. On GBU-27, there is an integrated part for stabilization marked BSG-88/B, and on GBU-28, there is an integrated BSG-92/B.



Figure 1 / Slika 1

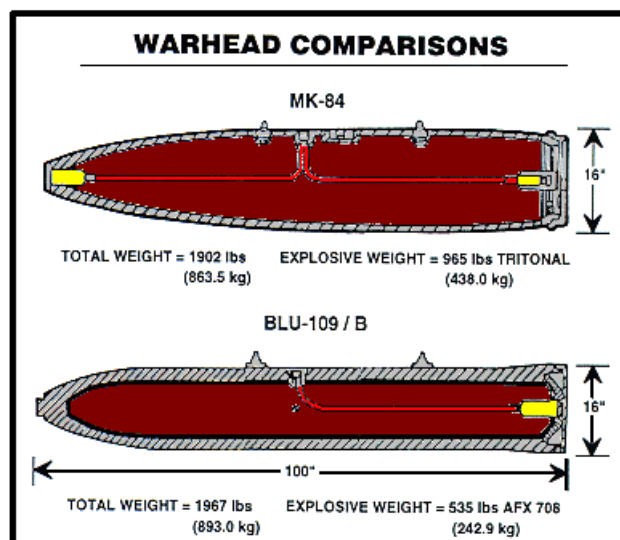


Figure 2 / Slika 2





Figure 3 / Slika 3

Bomb GBU-27 / Bomba GBU-27

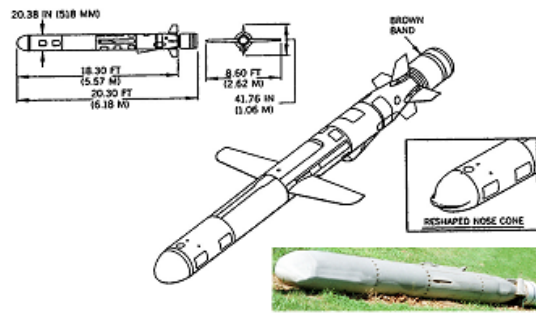


Figure 4 / Slika 4

Bomb GBU-28 / Bomba GBU-28



TECHNICAL IDENTIFICATION

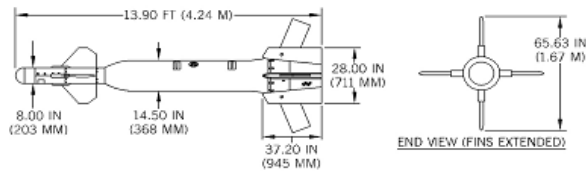


■ U.S. GUIDED MISSILES, SUBMARINE-TO-SURFACE,
■ UGM-109B-1, AND -2 (TOMAHAWK)

■ G-2-2-56-1

Ordnance used with:

WARHEADS: WDU-25/B, WDU-36/B



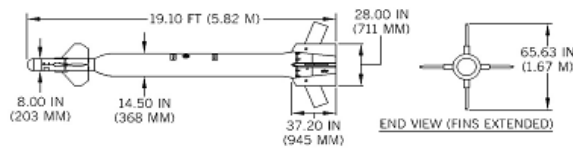
■ U.S. BOMB UNIT, GUIDED, GBU-27/B

■ B-2-4-6-11

Ordnance used with:

BOMB: BLU-113/B AND BLU-113A/B

FUZE: FMU-143F/B, FMU-143G/B, FMU-143H/B



■ U.S. BOMB UNITS, GBU-28/B AND GBU-28A/B

■ B-2-4-6-11

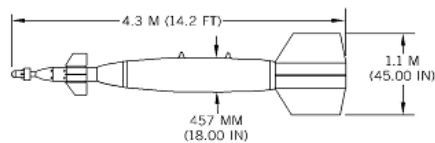
Ordnance used with:

BOMB: BLU-109/B

FUZE: FMU-139A/B

FUZE: FMU-81/B

FUZES: FMU-143/B, FMU-143B/B, FMU-124A/B



■ U.S. UNITS, GUIDED, GBU-10/B & GBU-10A/B

■ B-2-4-6-2

Ordnance used with:

BOMB: MK 84

FUZES: FMU-139/B

FUZES: FMU-26-SERIES

FUZES: FMU-81/B

FUZES: M905

FUZES: MKS 344-0 & MK 376-0



■ U.S. BOMB UNITS, GUIDED, GBU-10C/B, D/B, AND E/B

■ **B-2-4-6-6**

Ordnance used with:

BOMB: MK 84

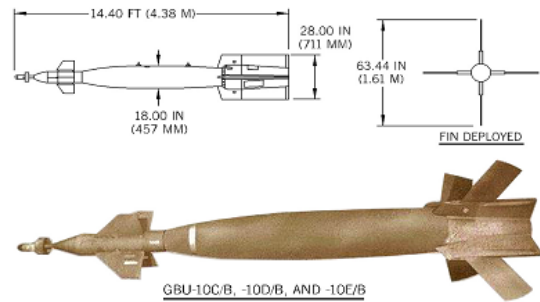
FUZES: FMU-139 A/B, 139/B

FUZES: FMU-26 B/B

FUZES: FMU-81/B

FUZES: M905

FUZES: MK 344 MODS 0 & 1, MK 376 MOD 0



■ U.S. BOMB FUZE, TAIL, IMPACT, SHORT DELAY, M905

■ **B-2-3-27**

Ordnance used with:

BOMBS: BLU-82B

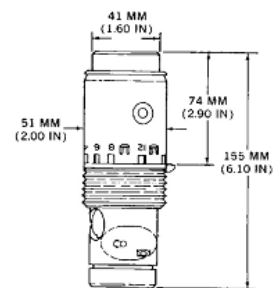
BOMBS: M117 SERIES & M118

BOMBS: M121

BOMBS: MKS 81, 82, 83, 84

CHEMICAL BOMB: MC-1

GUIDED BOMB UNITS: GBU-10/B & GBU-10A/B



APPENDIX IX: PERSONNEL QUALIFICATIONS

The Contractor shall employ only staff that satisfies the requirements of the National Mine Action Center/MAC. The EOD staff should have qualifications appropriate to handle and scope the UXO threat and the land, wetland and underwater munitions to be found. The IMAS qualifications listed below shall apply:

- a) A Level 1 (EOD) qualification enables a deminer to locate, expose and destroy under supervision in situ mines that the deminer has been specifically trained on;
- b) A Level 2 (EOD) qualification enables a deminer to undertake the destruction in-situ of single small UXO such as sub-munitions, grenades and mortar ammunition up to 84 mm this includes High Explosive Anti Tank (HEAT) charges. These categories of munitions normally represent the majority of UXO found in and around mined areas;
- c) A Level 3 (EOD) qualification is for a deminer who has had specific EOD training in the disposal by detonation of larger UXO, such as rocket and tank gun ammunition, and artillery ammunition up to 160 mm; this includes High Explosive Anti Tank (HEAT) charges. Under the supervision and direction of a qualified supervisor, a Level 3 (EOD) deminer should be qualified to render safe UXO for safe removal from the EOD worksite, and to undertake their final destruction; and
- d) A Level 4 (EOD) qualification enables a clearance technician to plan and manage multiple UXO/mine clearance tasks, render safe UXO, dispose of all aircraft bombs (including 100 lb WP bombs and the use of low-order techniques). A level 4 clearance technician may also deal with UXO containing liquid propellant, Fuel Air Explosive (FAE) and lethal and damaging chemical agents provided they have specialist qualifications, recognised by the NRA, to deal with these items. This level of EOD qualification applies to national clearance technicians at the UXO clearance management level.

Note: this level would typically apply to a senior EOD technician. A level 4 EOD qualification is for those small number of specialist EOD staff who have been trained, and are qualified, to destroy the remaining EOD hazards with specialist EOD techniques, including the bulk disposal of rendered safe UXO and other recovered ammunition.

REQUIRED QUALIFICATIONS FOR THE SITE

1 Geophysical work

The geophysicist(s) working on the project must have a minimum of four (4) years of experience in conducting electromagnetic geophysical surveys (from gathering data to producing dig sheets) related to the detection of UXO.

The instrument technician(s) (GPS, multibeam, side-scan, sub-bottom profiler, and Caesium-Vapour-Magnetometer/marine magnetometer, etc.) working on the project must have a minimum of two (2) years of experience in conducting electromagnetic geophysical surveys related to the detection of UXO.

2 UXO technical services (see information hereafter)

The Contractor's personnel dedicated to UXO technical services must, according to their respective tasks, comply with the required qualifications expressed in the IMAS.

UXO/EOD-Qualified Personnel. Personnel who have performed successfully in military EOD positions, or are qualified to perform in the following Department of Labor, Service Contract Act, Directory of Occupations, contractor positions: UXO Technician II, UXO Technician III, UXO Safety Officer, UXO Quality Control Specialist, or Senior UXO Supervisor (IMAS Level IV).

UXO Technicians. Personnel who are qualified for and filling Department of Labor, Service Contract Act, Directory of Occupations, contractor positions of UXO Technician I, UXO Technician II, and UXO Technician III.



3 Diving activities (see details hereafter)

When diving is conducted, the Contractor's personnel must comply, in addition to qualifications mentioned above, with the required qualifications expressed in the International Standards of commercial diving and underwater operation, or/and with the SOP of the Humanitarian Demining Underwater regulation in South Eastern Europe.

Minimum Personnel Requirements for one task and specifications:

- 1 Air Diving Supervisor
- 1 Diver (and 1 EOD Diver until the UXO neutralisation before the removal)
- 1 Tender/Diver who shall be properly equipped and capable of performing the duties of a Standby Diver

a. Diving Supervisor

A qualified person shall be designated as the Diving Supervisor for each diving operation. The Diving Supervisor is in charge of the planning and execution of the diving operation, including the responsibility for the safety and health of the dive team. The Diving Supervisor shall possess the proper ADCI Supervisor certification card and be knowledgeable and familiar with all techniques, procedures, emergency procedures and operational parameters for the Diving Mode under their direct supervision.

b. Diver (Professional diver/EOD unqualified, and EOD diver)

Must have training and/or experience in the following areas:

- Air diving procedures and techniques
- Emergency procedures
- Diving accident treatment procedures
- Proper operation and use of all equipment related to air diving including decompression chambers
- Use of air diving equipment
- Familiarity with the type of work engaged in

c. Tender/Diver

- Must have the same qualifications as an Air Diver, with a lower level of experience required.

d. An additional dive crew member is normally required when any diving operation is conducted that has an increased likelihood of diver entrapment or potential for rendering the diver unconscious or incapacitated from chemical, physical, electrical, or topside hazards, such as but not limited to the following when present or planned:

- During the conduct of the Job Safety Analysis (JSA), the Diving Supervisor must consider whether the use of any surface-tended equipment by the diver will require an additional individual to tend associated cables or hoses. This includes hand jetting, water blasting, cutting and welding, the use of any pneumatic or hydraulically operated tool, or the use of underwater video or sonar equipment requiring a power or data cable not affixed to the diver's umbilical.
- Diving in remote locations where assistance from non-diving crew personnel is not immediately available within communication range of the Diving Supervisor may require additional members to be added to the dive team.

4 Navigation

Personnel in charge of navigation must possess a valid pleasure craft operation card.

5 First Aid



The Contractor shall certify that at all times during field work, at least one of the employees is First Aid qualified.

KEY EXPERTS

Figures are given below of the approximate number of work days for each of the key and other experts. These are only indicative.

All experts must be fluent in written and spoken English, must ensure good communications / working relationships with the Beneficiary, have excellent analytical, communication, drafting and presentation skills and be fully computer literate.

Key expert 1: UXO Project Leader/Contractor Representative (EOD Level 4/Mine Clearance Diver)

The Project Leader will coordinate and manage the implementation of activities and provide technical support. S/he will ensure the timely and effective implementation of the project and achievement of results, through the proposed activities. S/he will also be responsible for development and coordination of the work plan (and, when necessary, modifications to the work plan, with the agreement of the EU Delegation, MAC and Plovput) in accordance with the specific of the project. S/he is responsible for liaison between the client and contractor, and must ensure that experts input and distribute their working days in the most efficient and effective manner.

Qualifications and skills

Required: Degree or Diploma in Military Engineering (i.e.: Master Diploma “EOD”, Naval Ordnance Officer Diploma/Weapons Technical Diploma...) or equivalent in a civilian field together with Professional Registration (Certificate or military equivalent).

S/he must be qualified in Explosive Ordnance Disposal (EOD) Level 4 in accordance with IMAS. Post Graduate qualification or relevant specialisation in munitions disposal would be an asset. Experience in underwater clearance is obligatory

General professional experience

Required: at least (10) years of experience in military and/or UXO clearance operations.

S/he must have suitable experience in:

- Leading at least two (2) UXO international projects in the last ten (10) years
- Management of international projects
- Managing large multi-cultural teams
- Supervising and coordinating UXO technical work;
- Organising and overseeing administrative and logistic support
- Experience as Team Leader for Bilateral or EU funded projects in New Member States and / or Central or Eastern Europe or in the Middle East would be an asset.

Specific professional experience

Preferably around 5 years of experience in similar underwater EOD / UXO clearance and MEC removal projects.

Key expert 2: UXO field Supervisor (UW EOD Level 4)

Qualifications and skills

Required: Degree or diploma in Military Engineering or equivalent in a civilian field together with Professional Registration (Certificate or military equivalent).



S/he must be qualified in Explosive Ordnance Disposal (EOD) Level 4 in accordance with IMAS. Post Graduate qualification or relevant specialisation in munitions disposal; experience in underwater clearance would be an asset.

General professional experience

Required: Experienced in the provision of similar services in transition economies with preferably eight years of experience.

Experience as Senior Expert (or Team Leader or Supervising and coordinating UXO clearance) for at least five (5) EU funded TA projects in New Members States and / or in the Middle East and / or Central or Eastern Europe (the latter would be an asset).

Specific professional experience

At least ten (10) years of experience in UXO removal; and significantly experience in similar underwater EOD / UXO clearance / MEC removal projects.

Proven experience in: coordination and logistics, or site supervision, scheduling, planning, and/or preparation of technical specifications of similar projects. Knowledge of Serbian language would be an advantage.

Key expert 3: Health & Safety Engineer (EOD Level 3)

Qualifications and skills

Required: Degree or diploma in Military Engineering or equivalent in a civilian field together with Professional Registration (Certificate or military equivalent).

S/he must be qualified in a health and safety discipline related to Explosive Ordnance Disposal (EOD Level 3). Post Graduate qualification or relevant specialisation in munitions disposal; experience in underwater clearance would be an asset.

General professional experience

Required: At least ten (10) years of experience EOD / UXO health and safety.

Experienced in the provision of similar services in transition countries and in the management and supervision of UXO survey and removal. Knowledge of Serbian would be an asset.

Specific professional experience

Preferably ten (10) years of experience of similar UXO projects and their health and safety management.

BASIC UXO STANDARDS QUALIFICATIONS - FOR YOUR INFORMATION:

THE FOL QUALS AND EXPERIENCE REQUIRED FOR CONTRACTED UXO CLEARANCE ACTIVITIES:

A. UXO PROJECT LEADER (UXOPL). THE UXOPL PROVIDES OVERALL MANAGEMENT OF THE CONTRACTORS TEAM AND ACTS AS THE LIAISON BETWEEN THE CONTRACTOR AND CLIENT

(1) QUALS. ON AN UXO SURVEY/CLEARANCE, EITHER THE UXOPL OR UXOFS MUST BE HB QUALIFIED (CONVENTIONAL MUNITIONS DISPOSAL (CMD)) AND THE OTHER POSITION MUST BE AT LEAST HA QUALIFIED (CMD-BASIC). AS WELL, THE UXOPL MUST BE:

(A) A RETIRED MIL PERS OR FOREIGN EQUIVALENT IN ONE OF THE FOL TRADES: AMMO TECH, AVN TECH (FMR AIR WPN TECH), CBT ENGR OR CLR DVR AND A GRADUATE OF THE HB CRSE. OFFRS WITH AEXN QUAL OR HB CRSE ARE ALSO ACCEPTABLE: OR

(B) A FOREIGN ARMED FORCES EQUIVALENT AS APPROVED

(2) EXPERIENCE. UXOPL MUST HAVE AS A MIN 10 YRS OF COMBINED MIL AND CIV RANGE/UXO CLEARANCE EXPERIENCE WITH A MIN 5 YRS EXPERIENCE AS A UXOFS OR UXOSO



B. UXO FIELD SUPERVISOR (UXOFS). THE UXOFS PROVIDES ON-SITE MANAGEMENT AND COORDINATION OF SITE ACTIVITIES

(1) QUALS. AS PER UXOPL

(2) EXPERIENCE. UXOFS MUST HAVE AS A MIN 8 YRS OF COMBINED MIL AND CIV UXO CLEARANCE EXPERIENCE WITH A MIN 3 YRS EXPERIENCE AS A UXOSO OR UXOQCS

C. UXO SAFETY OFFICER (UXOSO). THE UXOSO IS RESPONSIBLE FOR UXO AND EXPL SAFETY AND TRG

(1) QUALS. THE UXOSO MUST BE:

(A) A RETIRED MIL PERS OR FOREIGN EQUIVALENT IN ONE OF THE FOL TRADES: AMMO TECH, AVN TECH (FORMER AIR WPN TECH), CBT ENGR OR CLR DVR AND HA QUALIFIED OR OFFRS WITH AEXN QUAL OR HA TRAINING: OR

(B) A FOREIGN ARMED FORCES EQUIVALENT AS APPROVED

(2) EXPERIENCE. UXOSO MUST HAVE AS A MIN 8 YRS OF COMBINED MIL AND CIV UXO CLEARANCE EXPERIENCE AND A MIN 3 YRS EXPERIENCE AS A UXOTS OR UXOQCS

D. UXO QUALITY CONTROL SPECIALIST (UXOQCS). PROVIDED QUALITY CONTROL (QC) FOR ALL PROJECT RELATED ACTIVITIES

(1) QUALS. AS PER UXOSO

(2) EXPERIENCE. UXOQCS MUST HAVE A MIN 8 YRS OF COMBINED MIL AND CIV UXO CLEARANCE EXPERIENCE AND A MIN 3 YRS EXPERIENCE AS A UXOTS

E. UXO TECHNICIAN SUPERVISOR (UXOTS). PROVIDES SUPERVISION FOR UXO TECH AND OTHER TEAMS

(1) QUALS. THE UXOTS MUST BE EITHER:

(A) QUALIFIED HA:

(B) A GRADUATE OF A MIL EOD SCHOOL WITH UXO/EOD TRG CONSISTING OF A MIN OF 200 HRS OF INSTR OR OTHER FOREIGN ARMED FORCES EQUIVALENCY AS BE APPROVED

(C) A GRADUATE OF A FORMAL (UNIVERSITY, COLLEGE OR INSTITUTE) TRG CRSE OF UXO INSTR CONSISTING OF A MIN OF 200 HRS INSTR THAT HAS BEEN APPROVED

(2) EXPERIENCE. UXOTS MUST HAVE A MIN 5 YRS OF COMBINED MIL AND CIV EOD OR UXO CLEARANCE EXPERIENCE

F. UXO TECHNICIAN (UXO TECH). PROVIDES A UXO SEARCH CAPABILITY AND ESCORT TO NON-UXO/EOD QUALIFIED PERS

OTHER EXPERTS

CVs for experts other than the key experts are also examined prior to the signature of the contract. They must be included in proposals.

The Contractor shall select and hire other experts as required according to the indicative profiles below in accordance with the IMAS rules and International Standards of commercial diving and underwater operation rules. These profiles indicate whether the experts are to be regarded as long-term/short-term and senior/junior so that it is clear which fee rate in the budget breakdown will apply to each profile. All experts must be independent and free from conflicts of interest in the responsibilities according to them. The CVs must be approved by MAC and the EUD's Programme Manager before mobilisation.

The Contractor may select and hire other experts as required according to the profiles the Contractor identifies and describes in their tender proposal.

The Contractor is asked to that all Non-Key Expert should match the following profile:

- Non-key Senior experts. All non-key senior experts must have an excellent command of spoken and written English and at least 10 years international experience in their professional area, which may be civilian and military EOD / UXO clearance;



- Non-key Junior experts. All non-key junior experts must have at least 5 years experience in their professional area, which may be civilian, and military EOD / UXO clearance.

The selection procedures used by the Contractor to select these other experts shall be transparent, and shall be based on pre-defined criteria, including professional qualifications, language skills and work experience. The selection of experts shall be subject to approval by the Contracting Authority.

Please, note that civil servants and other staff of the public administration of the beneficiary country cannot be recruited as experts, unless prior written approval has been obtained from the EU Delegation.

CIVILIAN EQUIVALENT QUALIFICATIONS FOR CONTRACTED UXO CLEARANCE

The indicative profiles for UXO quality control, technical supervision and technician / EOD diver must include both military and humanitarian training in UXO survey and removal and be able to provide search capabilities as well and escort responsibilities to all non-UXO qualified persons.

Civilian experience in UXO survey may be considered eligible if it can be demonstrated that that have received equivalent training and completed by a significant and proven experience in UXO survey.

AS A ROUGH GUIDE: (informative)

THE FOLLOWING CIVILIAN QUALS ARE ALSO APPROVED FOR CONTRACTED UXO CLEARANCE ACTIVITIES:

A. UXO ASSISTANT (UXOA). UXOA PROVIDE A WORKFORCE FOR NON-UXO/EOD SKILLED TASKS (I.E. GENERAL LABOURERS, BRUSH CLEARING, DETECTOR/INSTRUMENT HANDLERS, ETC.) WITHIN THE UXO DANGER/EXCLUSION ZONE. THE UXOA IS SUPERVISED BY A UXOTS OR HIGHER AND, WHILE IN THE UXO DANGER/EXCLUSION ZONE, IS ESCORTED AT ALL TIMES BY A UXO TECH OR HIGHER. THEY ARE NOT INVOLVED IN THE EXECUTION OF EXPL ACTIVITIES AND SHALL NOT HAVE INTENTIONAL PHYSICAL CONTACT WITH AMMO, EXPL OR UXO

(1) QUALS. THE UXOA MAY BE RETIRED MILITARY, FOREIGN EQUIVALENT OR CIV AND SHALL, AS A MIN, BE PROVIDED JOB AND SITE SPECIFIC TRG IN THE FOL:

(A) EXPL AND INDUSTRIAL SAFETY:

(B) RECOGNITION OF AMMO AND EXPL, PARTICULARLY UXO:

(C) OP OF EQUIP REQUIRED ON THE SITE: AND

(D) THE PROPER USE OF PPE

B. MUNITIONS SCRAP (MS) SCREENING. EACH LEVEL OF MS SCREENING MUST BE CONDUCTED BY INDEPENDENT SCREENERS IN ORDER TO ENSURE ANY UXOS ARE IDENTIFIED AND REMOVED FROM THE MS STREAM. MS SCREENING WILL ONLY BE CONDUCTED BY PERS HOLDING THE FOL MIN QUALS:

(1) LEVEL ONE SCREENERS FOR SUSPECT MS MUST BE UXO TECH OR HIGHER QUALIFIED:

(2) LEVEL TWO SCREENERS MUST BE UXOTS OR HIGHER QUALIFIED: AND

(3) LEVEL THREE SCREENERS MUST BE A CF RETIRED MIL PERS OR FOREIGN EQUIVALENT WHO HAVE HELD SUPERVISOR

C. DIVING QUALS. ALL DIVING SHALL BE CARRIED OUT IN ACCORDANCE WITH INTERNATIONAL STANDARDS. THE CONTRACTOR MUST ENSURE THAT ALL PERS PERFORMING ANY WORK UNDERWATER MEET ALL NATIONAL AND PROVINCIAL WORK PLACE DIVING REGULATIONS AND LICENSING REQUIREMENTS FOR THE DEPTHS REQUIRED ON THE TASK SITE PRIOR TO COMMENCING WORK ON SITE. UXO QUALS ARE IN PARA ABOVE.

TRAINING

The Contractor shall employ well trained and qualified EOD personnel and experts for land and underwater surveys and UXO search activities and shall utilise efficient and safe equipment and materials. Diving activities for underwater operation shall be carried out with experts of various



skill levels for the safe and efficient qualified EOD divers. The EOD divers may work only with such means and in such situations for which they are trained and authorised according to the IMAS for humanitarian demining and UXO works, and according to the SOP for Humanitarian Underwater Demining in South Eastern Europe.

The Contractor shall provide documentation demonstrating that all EOD divers/MCD and professional divers employed or used have attended and passed approved and appropriate training.

VERIFICATION OF PERSONNEL QUALIFICATIONS

As specified the Contractor must include in the Work Plan the resumes and the proof of training and qualification of all personnel involved in the project

The EU Delegation and the MAC reserves the right to review the resumes and proof of qualification solely for the purpose of ascertaining their training/qualifications relative to their task(s).

Personnel found to be untrained/unqualified to accomplish their task(s) could be asked to leave the work site by the EU Delegation, MAC or Supervisor and the Contractor will have to supply new and appropriately qualified personnel.

Any delays/loss of revenue caused by untrained/unqualified personnel being replaced is solely assumed by the Contractor.



APPENDIX X: MINE ACTION CENTER CLEARANCE REPORT FORMS



 Implementing Agency

MINE ACTION CENTRE
31, Vojvode Toze Street
11000 Belgrade

Subject: Demining – Clearance Report for Month _____ Year _____

Project Title

Project Area

Coordinates

TU - X= Y=

Place

Number of teams	Number of deminers in a team (leader +dem.)	Number of working days per teams	Demined - cleared m ²	Total demined – cleared area from the beginning of works m ²	Found: Type and Number			
			Manually		Cluster munitions (bombs)	Various types of unexploded ordnance (UXO)	Various types of mines	Miscellaneous
1	2	3	4	5	6	7		8

Note:

Function, Name, Surname and Signature of the authorized representative of the Implementing Agency

Place of Seal

Implementing Agency

MINE ACTION CENTRE
31, Vojvode Toze Street
11000 Belgrade

Subject: Demining – Clearance Report for Week _____ Year _____

Project Title

Project Area

Coordinates

TU - X= Y=

Place

Number of teams	Number of deminers in a team (leader +dem.)	Number of working days per teams	Demined - cleared m ²	Total demined – cleared area from the beginning of works m ²	Found: Type and Number			
			Manually		Cluster munitions (bombs)	Various types of unexploded ordnance (UXO)	Various Types of Mines	Miscellaneous
1	2	3	4	5	6	7	8	9

Note:

Function, Name, Surname and Signature of the authorized representative of the Implementing Agency



IPA 2010 “Survey and Removal of UXO from the Danube River”. EuropeAid/130565/C/UKS/RS

Place of
Seal

