

# Sudan National Mine Action Standards – SNMAS 06.01

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## Clearance Requirements

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## **1. Introduction**

Mine and Explosive Remnants of WAR (ERW) clearance is an important part of land release operations. Land release is described as the process of applying all reasonable effort to identify, define, and remove all presence and suspicion of mines and ERW through non-technical survey, technical survey and or clearance. Clearance is the last activity in land release process and should mainly be carried out in Confirmed Hazardous Areas (CHA), however, parts of Suspected Hazardous Areas (SHA) may also be recommended to limited clearance operations, which are normally established following a non-technical survey or technical survey. The aim of clearance is the identification, removal and destruction of all mines and ERW hazards, from a specified area to a specified depth to ensure the land is safe for land users.

The land release including clearance shall be undertaken in such a way that the beneficiaries of are fully confident that cleared and released land is safe for their use. This requires management systems and clearance procedures which are appropriate, effective, efficient and safe. The communities live in and around the hazardous areas shall be involved in the process and receive regular briefings and explanations during the clearance operation as this acts as a very effective confidence building measure; Community Liaison (CL) is an integral part of the land release process and shall be considered by mine action organizations throughout the demining and other mine action activities including Mine and ERW Risk Education (MRE).

To build the confidence of land release beneficiaries and stakeholders, mine action organizations shall establish an effective management system, establish and follow programme policies, develop and maintain operating procedures, and apply these procedures in a safe, effective and efficient manner. Management system and operating procedures shall be based on national mine action standards and auditable.

## **2. Scope**

This SNMAS provides standard guideline on clearance requirements within the mine action context of Sudan which includes manual clearance and road and routes clearance. This standard should be read in conjunction with national standards for Battle Area Clearance (BAC), Explosive Ordnance Disposal (EOD), Mechanical and MDD standards, and other national standards for land release process. All mine action organizations working in Sudan shall develop their SOPs considering the requirements of Sudan national mine action standards.

## **3. References**

IMAS 09.10 is the main reference for this SNMAS, however, Sudan specific requirements have also been considered.

## **4. Terms and Definitions**

A complete glossary of all the terms, definitions and abbreviations used in the SNMAS are given in IMAS 04.10. However, all the terms relating to land release process are covered in SNMAS 07.01.

## **5. Manual Clearance Requirements**

### **5.1 General**

The following requirements shall be considered in Sudan Mine Action Programme:

- 1) A specified land shall be accepted as 'cleared' when all mine and ERW hazards are identified and destroyed from that area to the specified depth.
- 2) The specified area to be cleared shall be determined by a non-technical and or technical survey or from other reliable information which establishes the extent of the mine and ERW hazard area.
- 3) The priorities for clearance as part of land release process or standalone clearance intervention, if needed, shall be determined based on the requirements of SNMAS 03.01 and the priorities of affected communities and humanitarian and development needs.
- 4) All mine action organizations conducting land release operations in Sudan, shall be operationally accredited covering all their capabilities such as manual, mechanical and mine detection dog.
- 5) Each hazardous area shall be subject to reconnaissance prior to issuance of task order by NMAC.
- 6) Community Liaison shall be an integral part of land release process including clearance operations.

### **5.2 Steps of Manual Clearance Operations**

Generally the followings steps should be considered during manual clearance operations:

- 1) Visually and manually inspect the area in front of the Base Stick for tripwires, ERW, surface-laid mines, protruding fuses or suspicious objects;
- 2) Using a tripwire feeler to search for tripwires if the minefield is covered by vegetation;
- 3) Clear vegetation as required, using a appropriate tool.
- 4) Carry out controlled sweeps with a metal detector over the entire width of the clearance lane.

### **5.3 Detection of Tripwires**

Alight-gauge tripwire feeler that is fabricated in such a way to allow the detection of loose and tight wires shall be used to locate tripwires. If the vegetation does not allow the use of a tripwire feeler, the deminer shall proceed with visual search followed manually with the use of hands slowly moving forward, gently parting any thick vegetation that may obscure tripwires.

### **5.4 Vegetation Removal in Clearance Lane**

Vegetation removal shall take place in a safe and controlled manner, limiting environmental impact of vegetation removal and avoiding any disturbance of vegetation outside the width of the clearance lane.

The demining teams shall undertake a field risk assessment (FRA) and specify the level of vegetation effects as site specific obstacles, and the develop and apply the appropriate procedure for vegetation removal. The FRA shall be submitted to NMAC sub office for approval.

#### 5.4.1 Burning Vegetation

To avoid environmental impact of demining operations, burning of vegetation should not be the primary option, rather and if needed, vegetation removal through cutting them in clearance lanes should be considered as preferred method. However, if burning found to be the only option to facilitate safe clearance, then the following requirements shall be met:

- 1) Demining organization's supervisor and team leaders consulted with NMAC, local authority and community and got their agreement;
- 2) Ensure that there is no damage to neighboring areas;
- 3) Ensure limited burning of vegetation;
- 4) Ensure no movement around and in the vicinity of burning vegetation, as burning may alert the stability of ERW and can result in explosion;
- 5) A minimum wait time of 24 hours should elapse between burning an area and manual clearance taking place on it;
- 6) In all cases, a suitable firebreak should be constructed and NMAC sub office and local services (if available) shall be informed, during the burning operation;
- 7) A minimum wait time of one week shall elapse between burning an area and MDD operations taking place; and
- 8) The authorization for burning shall be taken from NMAC sub office.

#### 5.5 Use of the Metal Detector

Metal detector shall be properly assembled, tested and compensated (detectors with such specification) prior to start sweeping in a clearance lane, it shall always be ensured that each single detector is fully functional, checked, balanced and its sensitivity adjusted to the target specified in the area.

As routine confirmation test, the sensitivity of the metal detector shall be checked at least once every **fifteen minutes** and any changes shall be notified to team leader and recorded. Details of detector calibration from the manufactures shall be included in the organizations SOPs.

The detector shall be used to check the minimum of 120 cm of the clearance lane; as one meter wide lane and 10 cm of safety margin to both sides of the clearance lane. The metal detector search shall be conducted to a maximum of 50 cm forward of the base stick, ensuring that the area is checked at least twice. The detector search process shall incorporate an overlap, ensuring that the distance moved forward is at least ten cm less than the distance searched.

#### 5.6 Base Sticks

SNMAS 05.04 covered the requirements for Base Stick in details. The Base Stick shall be used to establish a clear understanding that the area behind the stick is safe and cleared from the hazards and the area in front of the stick is unsafe and not yet cleared. The deminer shall never cross the Base Stick forward towards the hazardous area. The detector sweep shall take place in front of the stick covering the same width and maximum 50 cm in length of the clearance lane. When moving the Base Stick forward; a safety margin or overlap of minimum 10 cm shall be maintained. It means 50cm searched but base stick shall be moved forward to a maximum of 40 cm.

#### 5.7 Depth of Clearance

The depth of clearance shall be determined by the clearance organization in consultation with NMAC sub office and developed during the reconnaissance activities considering the information

from non-technical and technical surveys, or other reliable information and intended land use. Otherwise, the minimum clearance depth shall not be less than 13cm from the original ground surface to the top of explosive hazard. Specifying clearance depths will depend on the intended land use, the likely mine and or ERW hazards in the area and other environmental factors. When determining the clearance depth, the following requirements shall be considered:

- 1) Review and adjust the clearance depth as clearance activity progresses, and any changes agreed upon between NMAC and mine action organization and formally recorded in task dossier.
- 2) When explosive hazards are anticipated at depths greater than can be reliably detected with the available metal detectors, an alternative or combined method of clearance be selected and agreed upon between NMAC and mine action organization.
- 3) For mines and ERW laid on the surface of the ground, the specification may call for their removal and or destruction in situ. However, this shall be decided as a result of technical survey to confirm that there is no sub-surface explosive ordnance in the area.
- 4) Clearance in urban areas may require the removal of many meters of rubble as part of the clearance process. The depth of clearance shall be determined based on local situation and the amount of rubbles and accumulated soil on the original ground surface.
- 5) In situations where large ERW including bombs and missiles have been used, the depth of clearance may be several meters.
- 6) If the ground level has changed since mines were originally emplaced, then the clearance requirement shall be written in Task Order in such a way as to ensure that there is no misunderstanding over the required clearance depth.

Shifting sands in desert areas or coastal areas may require clearance to a depth of 1.0m or 2.0m to locate and destroy mines which were originally laid. The requirements for clearance depth as covered in this standard shall be considered in all contractual agreements Task Order. The main references for Call for Proposals and Request for Proposals within Sudan shall be Sudan Mine Action Standards.

### **5.8 Investigation of Detected Signal with Prodding**

When undertaking investigation of detected signals the following are applied:

- 1) All the signals that are detected and pinpointed with a metal detector shall be counted as hazard item, unless the source is a visible metal fragment.
- 2) When the visible metal fragment is removed, the point shall be searched again to ensure no more signals exist there.
- 3) All the pinpointed signals shall be carefully dealt with; the investigation process through prodding shall be started from a safety distance of minimum 15cm before reaching to the signal marker.
- 4) The pinpointed signal shall be marked with signal marker, that is a piece of wood, square or circular in shape, 5 cm in diameter and painted with red color. Refer to annex A of SNMAS 05.04

- 5) The prodder shall be used considering an angle of 30 degree with the ground surface, and should be inserted to the ground in less than 5 cm apart, or less than the size of smallest mine found in Sudan and the entire width of the signal shall be covered.
- 6) Depth of each prod should be to the same level and where necessary the ground should be removed and a second deeper prod should be used to ensure the full search depth has been achieved.
- 7) Where hard ground is encountered water may be used to soften the ground before prodding.
- 8) When getting closer to the signal, the prodder should not be used; rather a scrapper is used to discover the source of signal.

#### **5.9 Investigation of Detected Signal with Excavation or Sapping**

After locating and pinpointing the signal, the appropriate NMAC approved excavation tool shall be used to remove the soil and identify the source of signal. Any excavation shall ensure the required depth is achieved and no downwards pressure is applied. The trench for excavation shall at minimum be 20cm in depth and 15 cm behind the pinpointed signal.

If an object is not located after using the prodder, the cause of the metal detector signal may be either a deeply buried mine or a Small Arm Ammunition (SSA) or small metal object. The excavation tool shall still be used to remove the soil and locate the source of signal. The same process of signal investigation shall be repeated until the source of signal is identified and the excavation trench should be wide enough to allow the movement of the excavation tool. After the removal of and dealing with signal, the area shall be re-searched with detector to ensure no more signals exist.

#### **5.10 Pulling Drill**

In order to facilitate safe clearance operations, there may be a need to remotely pull a mine or ERW or an obstacle in a hazardous area. When pulling is required, the supervisor is responsible for the pulling the target. The rest of team members shall be withdrawn to a safe area and sentries posted. A pulling non-stretchable cable shall be laid along the clear ground between the pulling point and the location of the item. As part of safety and protection actions, and if there is no other barrier, sandbag fulcrum should be placed at a safe distance before the item to establish barrier against blast fragmentation, and provide a greater angle to dislodge the item from its position.

As soon as the safety and protection actions completed and team members retired to the safe area, a hook/clip should be attached or the cable is tied to the target. The item should be pulled in a slow, continuous motion, avoiding any sharp jerking action. A minimum wait-time of 60 seconds shall be considered before approaching the item. The type of ERW or mine being pulled shall dictate requirements for extended wait time. If signs of smoke are seen from the area, a wait-time of at least 30 minutes shall be enforced, commencing from the last signs of smoke. After the wait-time has elapsed, the sentries shall remain in position while the pulled item is checked. This is a 'one-man risk' and shall be conducted by an EOD qualified operator.

#### **5.11 Areas with High Metal Contents**

In areas where the metallic content of the soil is high, the metal detector may be ineffective. The detector procedure shall then be removed from the mine clearance sequence and replaced with a complete excavating to a depth stated in tasking order or identified during the clearance of similar tasks in the area, from the original ground surface.

### **5.12 Mountainous and Rocky Terrain**

In areas where the ground is mountainous and rocky, there may be situations that permit limited use of detectors and may require removal of rocks. In such cases full attention shall be paid to possible presence of explosive ordnance beneath the rocks. Therefore, the team supervisors shall undertake periodic Field Risk Assessment to make informed and the most practical decision on the best and safe clearance methods including visual search, the use of detectors around the rocks before moving them and removal of rocks through the pulling drill. If seemed necessary to remove the rocks manually, effort shall be made to ensure there is no EO around the rock and can be lifted manually to avoid any unintended detonation. If possible, the rocks should be lifted vertically with full attention to be paid to the safety of operators.

### **5.13 Clearance of Obstacles**

In EO contaminated areas with certain obstacles, a procedure for clearing obstacles shall be used as a result of comprehensive FRA. The following are considered as potential obstacles:

- a) Former trenches in defensive positions;
- b) Ditches in mined areas;
- c) Massive barbed wire, Fortified wire entanglements; and
- d) Abandoned vehicles.

Obstacles shall ideally be cleared 360 degrees around and along the axis on both sides. The EOD qualified operator should be consulted, if required.

## **6. Working Hours**

A demining team shall not work longer than 50 minutes before taking a break of at least 10 minutes. The working time may vary based on weather and climate conditions. However, the deminers' rest period shall not be disturbed. A normal working day for a demining team should not exceed 8 hours, including travel to/from the site. In excessive climatic conditions, the working hours may be adjusted and reduced or the daily routine changed. A safe and sensible approach shall be considered by the demining supervisors in order to achieve the best possible clearance results without compromising the safety of demining team personnel and the quality of work.

## **7. Road and Route Clearance Requirements**

Following non-technical survey (NTS), the routes and roads that have been identified as SHA, shall require further efforts of information gathering especially during the land release process. Further information gathering or NTS can result in recommending cancellation of the area, or a need for technical survey and possible limited clearance.

The routes and roads that are confirmed to contain EO, shall be subject to technical survey and clearance using appropriate methodology and assets including the use of mechanical demining units.

### **7.1 General**

The following requirements shall be considered by mine action organization during road and or route clearance:

- 1) Width of route and road to be cleared depends on the local conditions; however, the required clearance width should not be less than 8 meters. The width can be increased to



facilitate and accommodate reconstruction machinery and activities to take place as donors may want to expand the width.

- 2) All survey and assessment information relating to the roads and routes that are collected through the use of different methods shall be entered to IMSMA and properly maintained for timely analysis and planning and prioritization purpose.
- 3) Producing hazards maps and GIS information including existing features related to the ground profile throughout the length of the routes and roads are crucial for planning and prioritization, to be considered.
- 4) When planning road or route clearance operations, all the information shall be properly analyzed by NMAC Operations department, its sub office and mine action organization.
- 5) The result of analysis shall be documented and added to the task dossier. This will help clearance organization to apply all reasonable efforts and conduct effective clearance. For details about all reasonable efforts refer to SNMAS 05.01, 05.02 and 05.03 and land release policy.

## **7.2 Road and Route Clearance Operations**

NMAC operations department in consultation with sub office and a comprehensive data analysis may authorize use of certain assets and clearance methods including manual clearance, or manual supported by MDD and or mechanical, to effectively suit the specific local situations and site specific requirements; provided that the required level of confidence on detection and clearance of all hazards is built and being achieved. For details about mechanical and MDD operations refer to SNMAS 06.04 and 06.05.

Any decision on integrated operations using different assets together shall be based on a comprehensive Field Risk Assessment and properly documented.

## **7.3 Post Road and Route Clearance Marking**

Where a road and or a route passes through a big CHA or SHA and the presence or suspicion of contamination remainsto the flanks of the cleared road or route and it is impossible to conduct land release operations there in immediate future; permanent marking and or fencing shall be established and erected to both sides of the road to establish a clear and visible barriers to the local people to avoid entering the contaminated areas. For details about permanent marking and fencing refer to SNMAS 05.04, however, the following requirements shall be fulfilled:

- 1) The Permanent Marking and Fencing should extend each side of the outer boundaries of the contaminated area, with both sides of roads being fenced; the fencing should be placed at minimum 1m inside the actual cleared area.
- 2) The marking of cleared route and road following clearance shall be unambiguous and permanent.
- 3) The control markers including Reference Point, Bench Mark, Start Point and each Turning Point shall be physically marked and situated in accordance with the requirements of SNMAS 05.04.

- 4) If following the NTS no specific hazardous areas are identified to any side of the route or road and if the width of it is less than 50 meters; then the left side of the road and route shall be used as the marking line.
- 5) Coordinates of control markers shall be recorded either with DGPS or GPS.
- 6) All turning points coordinates, shall be recorded and included in IMSMA Completion or Suspension report, and associated map submitted.

#### **7.4 Post Route Clearance Documentation**

If presence or suspicion of contamination remains to both or one flanks of the cleared route or road, it shall be clearly mentioned in IMSMA completion report, if needed the remaining area should be surveyed as a separate hazardous area either SHA or CHA based on indirect or direct evidence identified there. If there is no presence or suspicion of hazards remained around the cleared route or road, this shall also be covered in IMSMA completion reports.

### **8. Community Liaison**

Community Liaison shall be considered an integral aspect of mine action activities including land release process. CL intended to ensure the SMAP is sensitive and responsive to community needs and priorities including the needs of men, women and children. Mine action organizations shall ensure that the mine and or ERW affected communities understand and support mine action activities. CL in land release operations includes the following activities:

- 1) Data gathering on the scope and impact of mine and ERW hazards and victims of mine or ERW incidents, prior to the implementation of mine action, especially land release activities.
- 2) Establishing a baseline for data gathering on socio-economic impact of demining services, after the completion. This will help SMAP to measure the impact of humanitarian demining, learn lessons and to encourage socio-economic and development interventions;
- 3) Liaison and support to the local community members and leaders before, during, and after demining operations, to ensure that local needs are addressed and full consultation and dialogue is established;
- 4) Collecting information on hazardous areas, to facilitate mapping and marking of such areas and help identify and prioritize demining activities;
- 5) Liaison with government bodies, NGOs, mine action organisations and UN agencies to ensure a coordinated approach to development;
- 6) Providing information to the community representatives including men, women and youngsters on demining intervention and deliver RE to at-risk group of people within the community.
- 7) Supporting local community in its developmental efforts, through liaison with development agencies, victim assistance programmes, advocacy programmes and other community-led initiatives.

All the above activities should ensure that a mine action organisation will operate in the context of genuine, identified humanitarian needs, in full collaboration with the mine action stakeholders and beneficiaries.

## **9. Responsibilities**

### **9.1 National Mine Action Centre Sudan (NMAC)**

The Sudan National Mine Action Centre with technical support of UNMAS shall:

- 1) Specify the area to be cleared and depth of clearance in contracts, agreements and tasking order;
- 2) Specify the standards and guidelines for monitoring and QC to be applied to clearance contracts and agreements;
- 3) Accredite demining organizations and their clearance assets to undertake clearance operations in Sudan;
- 4) Conduct monitoring and QC of land release including clearance operations and outputs;
- 5) Undertake post demining impact assessment (PDIA) of the areas released through NTS, TS and clearance;
- 6) Manage and maintain Information Management System through IMSMA to record all survey and clearance data; and
- 7) Manage and maintain a quality management system in SMAP to ensure consistent delivery of quality clearance and land release services.

### **9.2 Mine Action (Demining) Organizations**

All mine action (demining) organizations working in Sudan shall:

- 1) Obtain accreditation from NMAC to operate as a clearance organization;
- 2) Apply the requirements of SNMAS throughout the clearance and land release operations, as specified in their contract agreements;
- 3) Develop SOPs for clearance and land release activities;
- 4) Maintain and make available documentation of clearance to NMAC and properly report their outputs in standard IMSMA forms as specified in SNMAS 10.01;
- 5) Ensure effective application of community liaison with the affected community and they are fully consulted and are cognizant of all demining activities in the area;
- 6) Ensure that the clearance priorities of men, women and children are considered throughout the clearance and land release operations;
- 7) Undertake internal monitoring and QC of their clearance activities and outputs, and regularly report to NMAC on the quality of their demining activities.