

LEBANON

MINE
ACTION
REVIEW

CLEARING CLUSTER
MUNITION REMNANTS
2019

CONVENTION ON CLUSTER MUNITIONS ARTICLE 4 DEADLINE: 1 MAY 2021
NOT ON TRACK TO MEET DEADLINE

KEY DATA

CLUSTER MUNITION
CONTAMINATION: MEDIUM

CONFIRMED
HAZARDOUS AREA

11.85 KM²

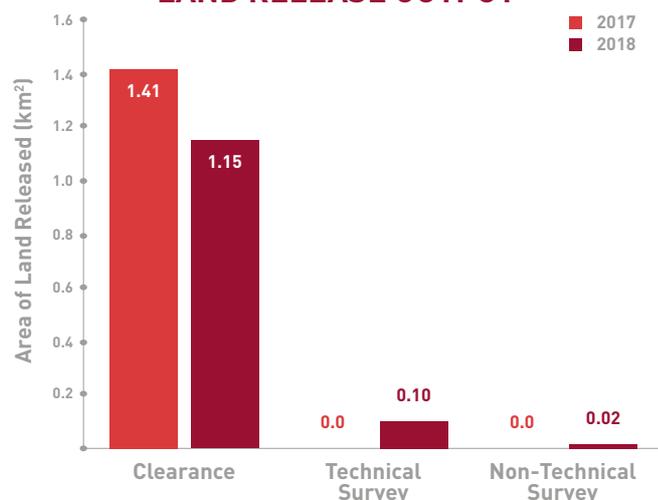
SUBMUNITION
CLEARANCE IN 2018

1.15 KM²

SUBMUNITIONS
DESTROYED IN 2018

3,583

LAND RELEASE OUTPUT



KEY DEVELOPMENTS

In March 2018, the Lebanon Mine Action Center (LMAC) released its revised National Mine Action Standards (NMAS), which incorporated significant and welcome improvements to its accepted methodology for survey and clearance of cluster munition remnants (CMR). These included, among others, reduction of the required clearance depth from 20cm to 15cm; adjustments to the fade-out specifications for clearance; and the option for technical survey of tasks. Technical survey, which had not previously been permitted for CMR, was successfully piloted in 2018. Furthermore, Mines Advisory Group (MAG) and Norwegian People's Aid (NPA) were tasked to conduct non-technical survey in 2018, which previously had been permitted only to the Lebanese Armed Forces (LAF).

RECOMMENDATIONS FOR ACTION

- LMAC should continue efforts to improve the accuracy of CMR contamination data recorded in its database, in order to determine a more accurate baseline for its Convention on Cluster Munitions (CCM) Article 4 extension request and the elaboration of a new national mine action strategy. Evidence-based non-technical and technical survey/re-survey of cluster munition-contaminated areas, which is currently underway, is needed to confirm or deny the presence of CMR and to more accurately determine the size of hazardous areas, many of which are currently recorded in the database as 10,000m². In parallel, LMAC could also review the estimated size of those hazardous areas currently recorded as standard size, based on average clearance sizes of CMR tasks in different geographical areas.
- LMAC should, in collaboration with clearance operators, continue to expand use of non-technical and technical survey (manual, mechanical, and with the use of explosive detection dogs (EDDs)), as a routine part of the toolbox for all operators for the release of cluster-munition tasks.
- The integration and consolidation of the LMAC and Regional Mine Action Center (RMAC) databases and servers should be completed as soon as possible, through ensuring a direct connection between databases.

ASSESSMENT OF NATIONAL PROGRAMME PERFORMANCE

Criterion	Score (2018)	Performance commentary
UNDERSTANDING OF CLUSTER MUNITION REMNANT (20% of overall score)	6	With a view to improving the accuracy of its estimate of CMR contamination, LMAC reviewed and then readjusted the national baseline of CMR contamination in 2018. However, the baseline includes CHAs with an estimated standard size of 10,000m ² (for hazardous areas recorded without defined boundaries), in addition to potentially underestimated CHAs which do not factor in fadeout.
NATIONAL OWNERSHIP AND PROGRAMME MANAGEMENT (10% of overall score)	9	LMAC demonstrated strong national ownership in 2018, with establishment of a bi-annual Mine Action Forum to provide a platform for dialogue, collaboration, and data sharing with donors, clearance operators, and partner organisations; creation of technical working groups which meet quarterly; and provision of substantial national funding for CMR clearance over the next five years.
GENDER (10% of overall score)	7	LMAC has taken action to mainstream gender in its implementation plan, including through inclusive policies, data disaggregation, and participation in courses at its regional demining school. Around 20% of survey and clearance staff of humanitarian clearance operators in Lebanon are women and 15% of staff in managerial level/supervisory positions.
INFORMATION MANAGEMENT AND REPORTING (10% of overall score)	7	LMAC is currently taking efforts to improve its information management system by harmonising the LMAC and RMAC databases. As at end of 2018, there was a single Information Management System for Mine Action (IMSMA) database and a synchronisation procedure in place, pending a hardware upgrade to establish a direct connection. LMAC has also starting preparations to migrate to IMSMA Core, with complete migration not expected until 2020.
PLANNING AND TASKING (10% of overall score)	8	LMAC has fallen well behind schedule on its current mine action plan for 2011–20, and is in the process of elaborating a new strategy, which will also correspond with Lebanon's planned Article 4 extension request, to be submitted and approved in 2020. There are agreed and specified criteria for prioritisation of CMR tasks.
LAND RELEASE SYSTEM (20% of overall score)	8	LMAC made significant improvements to its land release methodology in 2018, which are now enshrined in its revised NMAS. These include reduction of required clearance depth for CMR; improvements to the fadeout specifications; and the use of technical survey for CMR tasks for the first time. In addition, LMAC is increasing non-technical survey capacity and permitting humanitarian clearance organisations to conduct non-technical survey, something previously only undertaken by the LAF. These changes are expected to significantly improve operational efficiencies.
LAND RELEASE OUTPUTS AND ARTICLE 4 COMPLIANCE (20% of overall score)	6	While CMR clearance output in 2018 was slightly down on the previous year, CMR-contaminated land was reported as released through non-technical and technical survey by humanitarian clearance operators, which is a significant development in Lebanon. Lebanon is not on track to meet its Article 4 deadline and is in the process of preparing a five-year extension request for consideration at the Second Review Conference in 2020.
Average score	7.1	Overall programme performance: GOOD

CLUSTER MUNITION SURVEY AND CLEARANCE CAPACITY

MANAGEMENT

- Lebanon Mine Action Authority (LMAA)
- Lebanon Mine Action Center (LMAC)
- Regional Mine Action Center (RMAC)

NATIONAL OPERATORS

- Lebanese Armed Forces (LAF)/Engineering Regiment (ER)
- Lebanese Association for Mine and Natural Disaster Action (LAMINDA)
- Peace Generation Organization for Demining (POD)

INTERNATIONAL OPERATORS

- DanChurchAid (DCA)
- Mines Advisory Group (MAG)
- Norwegian People's Aid (NPA)

OTHER ACTORS

- Geneva International Centre for Humanitarian Demining (GICHD)
- United Nations Development Programme (UNDP)
- UN Interim Force in Lebanon (UNIFIL)
- United Nations Mine Action Service (UNMAS)

UNDERSTANDING OF CMR CONTAMINATION

At the end of 2018, Lebanon had 864 confirmed hazardous areas (CHAs) with CMR over a total area of more than 11.85km² (see Table 1).¹ This includes 84,079m² of confirmed CMR contamination recorded in Jroud Aarsal, in the north-east of Lebanon, which is new contamination resulting from fighting which spilled over from the Syrian conflict.²

In previous years LMAC had also reported to Mine Action Review the amount of suspected hazardous areas (SHAs)/“dangerous areas”. However, in 2019 LMAC confirmed that SHAs/dangerous areas do not relate to CMR contamination, but instead to areas suspected or known to contain other unexploded ordnance (UXO), booby traps, improvised explosive devices (IEDs), and “nuisance” mines.³ As such, they do not fall under Lebanon’s CCM Article 4 obligations.

Table 1: CMR contamination by province (at end 2018)⁴

Province	CHAs	Area (m ²)
Beqaa	83	1,895,221
Janoub and Nabatiyeh (South)	740	9,441,717
Jabal Loubnan (Mount Lebanon)	39	496,067
Shimal (North)	2	20,000
Totals	864	11,853,005

This is seemingly a big drop in CMR contamination compared to the end of 2017, when 843 CHAs were confirmed to contain CMR, over a total area of almost 17.2km².

In fact, the significant drop in the CMR baseline of CHA is largely due to a decision by LMAC in 2018 to review its baseline of CMR contamination and change the way it reflects clearance data. According to LMAC, a significant factor negatively impacting the accuracy of the CHA baseline for CMR was a difference in data entry methodology between RMAC and LMAC. In many cases actual clearance output of tasks is greater than the original task size recorded in the database, due to fadeout. Upon task completion, LMAC was reducing its initial baseline by the original task size in the database, whereas RMAC was adding the additional cleared area in excess of the task size to the initial database and then reducing the whole size of the clearance task from the database. Previously LMAC used to use the “moving” initial baseline of RMAC for reporting. This resulted in CMR contamination in Lebanon not being reduced proportionally with the amount of CMR-contaminated area released through clearance year-on-year, potentially leading to the misleading and incorrect assumption that little or no progress is being made to address CMR contamination.⁵

To address this, LMAC has decided to use the CMR baseline in its database (instead of RMAC’s baseline), meaning the original size of the clearance task will be reduced from the initial baseline and any additional squared metres cleared in excess of this are registered as “productivity”. LMAC has corrected its CMR baseline

retrospectively, to reflect this decision and the result is reportedly a reduction in the original CMR baseline by 4,290,513m². The retrospective aggregate cleared area has also changed. Table 1, above, reflects the corrected baseline as at the end of 2018, following LMAC’s 2018 review and amendment.

As part of the 2018 database review, LMAC also decided to address the inaccuracy of CHAs in the database for which there were no defined boundaries and for which the estimated circular boundaries were judged by LMAC to be excessively large and not logical.⁶ The hazardous areas in question, without delineated borders, were largely the result of impact surveys following the 2006 conflict, during which areas were defined using only very basic information.⁷ As part of the database review process, LMAC decided to change the standard size of CHAs with no defined boundaries (and for which there is no threat of mines), to 10,000m², based on the fadeout distance for cluster munitions and LMAC’s clearance experience to date.⁸ According to LMAC, this has resulted in a reduction of the original baseline of CHA by 4,448,942m².⁹ However, the 10,000m² (per strike) area automatically assigned to CHAs where there are no defined boundaries, will likely in some instances underestimate the actual task size. LMAC predicts that an additional 2.6km², on top of the 11.85km² CMR baseline may also require clearance based on the average of historic clearance data. However, the true size of these clearance tasks will vary and is hard to estimate.¹⁰

CMR contamination depends on a variety of factors, including the type of cluster munition used and whether it was ground-launched or air-dropped, as well as the terrain onto which it lands.¹¹ Some areas contain unexploded submunitions resulting from both ground-launched and air-dropped cluster munitions, which can further complicate the picture.¹² Previously, hazardous areas in the south of Lebanon were historically automatically recorded in the database as 33,000m² per task as standard, and in the Mount Lebanon region, as 10,000m² per task, as the 1982 cluster munition strikes were not as intense as the 2006 strikes in the south.¹³ Based on empirical field data, MAG calculated the average CMR clearance task in the south to be approximately 60,000m²,¹⁴ while NPA had previously calculated it to be 65,000m² per task.¹⁵ However, according to LMAC these averages were based on inflated initial estimates for the size of CHAs, with clearance conducted on a significant area that in fact contained no CMR.¹⁶ Only further re-survey (with non-technical and technical survey) will help determine a more accurate estimation of CMR contamination,¹⁷ and it is possible that actual extent of CMR contamination may in fact be greater than the 11.85km² of CHA reported as at the end of 2018.

The accuracy of the baseline is further complicated by the fact that clearance undertaken in the aftermath of the 2006 cluster munition strikes was not conducted in accordance with the International Mine Action Standards (IMAS). This included emergency clearance undertaken by the LAF and in and around infrastructure, schools, and roads, and clearance contracted out by the UN Mine Action Coordination Centre – south Lebanon (MACC-SL),

which assumed the role of coordinating CMR clearance in 2007, in cooperation with the National Demining Office (now known as LMAC), to non-governmental organisations (NGOs), commercial operators, and government groups.¹⁸

LMAC's recent efforts to adjust its baseline to one that more accurately estimates total CMR contamination is a positive step, as is the initiation of systematic non-technical and technical survey of proposed CMR clearance tasks, which will help to determine where contamination actually exists. However, only time will reveal how accurate the adjusted baseline of CMR contamination is.

MAG undertook a pre-clearance non-technical survey of 443 CMR clearance tasks between September 2013 and April 2014,¹⁹ with support in carrying out the survey from national NGO, Peace Generation Organization for Demining (POD). The survey resulted in MAG recommending 347 tasks for clearance and 96 tasks for cancellation, covering an estimated 2.8km².²⁰ After reviewing the 96 tasks recommended by MAG for cancellation, LMAC decided to cancel 51, totalling an area of 1.7km²,²¹ but not to cancel the remaining 45 tasks recommended for cancellation, as following a review LMAC believed these areas might still contain CMR and required additional investigation/survey. These tasks recommended for cancellation are being prioritised as part of the non-technical survey project in 2019,²² and where required, will be subject to 30% technical survey, to determine whether or not CMR contamination actually exists.²³

With regard to CMR contamination, technical survey is conducted on tasks where the exact location of contamination is not known and with a view to locating evidence points (i.e. submunitions), from where to start clearance.²⁴

CMR contamination is largely the result of the conflict with Israel in July–August 2006. During the conflict, Israel fired an estimated four million submunitions on south Lebanon, 90% of which were dispersed in the last 72 hours of the conflict.²⁵ An estimated one million submunitions failed to explode.²⁶ Some Israeli bombing data has been provided – most recently through UN Interim Force in Lebanon (UNIFIL) – but has proved to be very inaccurate.²⁷ In addition, some CMR still remain from earlier conflicts with Israel in 1978 and 1982,²⁸ and there is a small amount of new CMR contamination on the north-east border with Syria, resulting from spill-over of the Syrian conflict onto Lebanese territory in 2014–17 (see below).²⁹ Types of submunitions found in Lebanon include AO-2.5 RT, BLU-18, BLU-26, BLU-61, BLU-63, M42, M43, M46, M77, M85, MK118, and MZD-2.³⁰

NEW CMR CONTAMINATION

Eleven new hazardous areas confirmed as CMR-contaminated, totalling 84,079m² and containing M42 and AO-2.5 RT submunitions as well as other explosive ordnance, were recorded in "Jroud Aarsal" in the north-east along the border with Syria, as a result of spill-over in fighting from the Syrian conflict in 2014–17.³¹ The Lebanese territory in question was fully regained by the LAF in August 2017 and was assigned to LMAC for survey and clearance. Contamination also includes mines, IEDs, and explosive remnants of war (ERW).³²

OTHER EXPLOSIVE REMNANTS OF WAR AND LANDMINES

Lebanon is also contaminated by other UXO, booby-traps, and anti-personnel mines (see Mine Action Review's *Clearing the Mines* report on Lebanon for more information).

NATIONAL OWNERSHIP AND PROGRAMME MANAGEMENT

Established in 1998 by the Council of Ministers, the Lebanon Mine Action Authority (LMAA) is the responsibility of the Ministry of Defence and is chaired by the Minister of Defence himself. The LMAA has overall responsibility for Lebanon's mine action programme. In 2007, a national mine action policy outlined the structure, roles, and responsibilities within the programme, and LMAC was tasked to execute and coordinate the programme on behalf of the LMAA.³³

LMAC, part of the LAF, is based in Beirut. Since 2009, the RMAC, based in Nabatiye, which is a part of LMAC, has overseen operations in south Lebanon and western Beqaa, under LMAC supervision.³⁴ The Director of LMAC is typically rotated every couple of years, and in recent years there has been a high turnover of the colonels who have run the RMAC. Both factors have the potential to negatively affect the management of the two mine action centres. The current director of LMAC started in March 2019, replacing his predecessor who had served as director for two years.³⁵

United Nations Development Programme (UNDP) personnel, funded by the European Union (EU), are also seconded to LMAC and RMAC, providing support for capacity building, including transparency reporting,

strategic reviews, IMSMA database entry, community liaison, and quality assurance (QA). UNDP does not provide technical assistance on operational decisions.³⁶ However, European Union (EU) funding for UNDP institutional support to LMAC was due to come to a halt at the end of 2019, which will result in a gap in capacity development.³⁷

In 2015, the Lebanese Ministry of Defence, represented by LMAC, signed a Memorandum of Understanding with the Geneva International Centre for Humanitarian Demining (GICHD) to manage and coordinate the Arab Regional Cooperation Programme (ARCP) (formerly known as the Arabic-Language Outreach Programme) for Mine Action.³⁸ The role of the ARCP includes supporting the national authorities in mine action in the Middle East and North Africa (MENA) region; providing technical assistance and training; coordinating and hosting exchange visits; promoting best practices and documenting lessons learned; and mobilising funding.³⁹ Planning, management, and coordination of the programme were handed over to LMAC at the beginning of 2017.⁴⁰ The GICHD and LMAC will be renewing the Memorandum of Understanding (MoU) in 2019, regarding management and coordination of the ARCP.⁴¹

In addition, a Regional School for Humanitarian Demining in Lebanon (RSHDL) has been established in partnership between Lebanon and France, with technical mine action support provided by a French military Officer dispatched to LMAC, to support the development of the curriculum on EOD disposal (EOD levels 1, 2, and 3) in compliance with IMAS.⁴² In the second half of 2017 the Regional School was renovated and equipped and became operational, enabling civilian and military personnel from Arab and other countries to benefit from a wide array of courses and workshops related to demining.⁴³

A “Mine Action Forum” has been established in Lebanon in close partnership between LMAC and Norway, providing an informal platform for LMAC to continue dialogue and collaboration with donors, clearance operators, and partner organisations, and to discuss priorities and needs in cluster munition and landmine survey and clearance at the national level. The forum meets twice a year, with UNDP designated as the secretariat to follow up and develop progress reports.⁴⁴ It is an example of what a “Country Coalition” under the CCM could look like, but in the case of Lebanon it was agreed the forum should be broadened to include landmines, and not just CMR.

The Mine Action Forum was the result of a two Lebanon-focused workshops, the first of which took place in November 2016, convened by Norway and the Netherlands in their capacity as CCM Co- Coordinators on clearance, and facilitated by the GICHD. The second workshop, in January 2018, convened in partnership between Norway and LMAC, resulted in the establishment of the Mine Action Forum as a vehicle to continue dialogue, transparency, and information sharing between mine action stakeholders in Lebanon, including on where potential funding gaps exist and how the provision of funding can be better coordinated.⁴⁵

There is good coordination and collaboration between LMAC/RMAC and clearance operators, with the operators consulted before key decisions are taken.⁴⁶ International clearance operators also reported that there is an enabling environment for mine action in Lebanon, with no obstacles regarding visas for international staff, approval of MoUs, or the importation of necessary equipment.⁴⁷

A technical working group (TWG) was established in March 2018, under the auspices of LMAC, following the release of the revised NMAS. The TWG, which meets quarterly, provides a useful forum for LMAC/RMAC to meet collectively with clearance operators to review and discuss field issues, including implementation of revisions to the NMAS, and potential ways to improve operational efficiencies.⁴⁸ There is also an NMAS amendment form which is open to any mine action stakeholder to submit to the LMAC director.⁴⁹

As in the previous year, Lebanon reported contributing US\$9 million annually in 2018 towards mine action in Lebanon (including both CMR and mine-related work), to support costs associated with the running of LMAC (facilities and staff); the LAF Engineering Regiment companies working in demining; risk education; and victim assistance.⁵⁰ In addition, the Lebanese government has committed an additional 50 billion Lebanese Pounds (approximately US\$33 million) to CMR clearance over five years (2019–23), which will be used to increase the number of CMR clearance teams, helping Lebanon to meet its Article 4 obligations under the CCM. Corresponding clearance contracts with DanChurchAid (DCA), LAMINDA and POD were finalised at the end of 2018, but signature by the Minister of Defense was delayed due to the announcement of a new government at the end of January 2019. As funding for cluster munition clearance is included in the national budget, the NGOs took the decision to go ahead and begin CMR clearance operations in February 2019, using their own funds. However, they subsequently elected to stop operations after three months, pending formal signature of the clearance contracts by the Minister of Defence.⁵¹

The Mine Action Forum in Lebanon has resulted in better coordination and greater transparency; enhancements to land release methodology (enshrined in the revised NMAS), and including piloting of technical survey for CMR; and increased battle area clearance (BAC) funding allocated by the Lebanese government. These measures have all served to strengthen donor confidence and mobilise additional resources.⁵² Lebanon secured an additional 43% of funding for mine action in 2018 compared to the previous year, for both CMR- and mine-related work.⁵³

GENDER

LMAC reported that it has taken several actions to mainstream gender in its implementation plan, including through inclusive policies, data disaggregation in risk education and victim assistance, and participation in courses at the RSHDL.⁵⁴ According to LMAC, within the overall humanitarian clearance operators in Lebanon, approximately 20% of survey and clearance staff are women and 15% of managerial level/supervisory positions.⁵⁵

Lebanon hosted a workshop on gender in mine action at the RSHDL in July 2018, attended by Iraq, Libya, Palestine, Somalia, Sudan, and Yemen, as part of the ARCP.⁵⁶

MAG, NPA, and POD all reported having gender policies in place.⁵⁷

MAG reported that it consults women during survey and community liaison activities; that all its community liaison teams are mixed; and that its data is disaggregated by sex and age. Overall, women account for 15% percent of operational roles in MAG’s survey and clearance teams in Lebanon, and 30% of managerial level/supervisory positions.⁵⁸

As at April 2019, NPA was in the process of developing an implementation plan for its organisational gender policy for Lebanon, with support from the Geneva-based Gender and Mine Action Programme (GMAP, a programme of the GICHD), which was due to be finalised in 2019. NPA reported that its survey and community

liaison teams are gender balanced, and 15% percent of employees in operational roles in NPA's survey and clearance team are women; 9% in managerial level/supervisory positions. NPA disaggregates data by sex and age.⁵⁹

INFORMATION MANAGEMENT AND REPORTING

IMSMA is used by LMAC and RMAC to record contamination and land release in Lebanon. As at April 2019, efforts were underway to integrate RMAC's information management database with the LMAC server.⁶⁰ As at end of 2018, there was a single IMSMA database and a synchronisation procedure in place between the two LMAC and RMAC databases, pending a hardware upgrade to establish a direct connection.⁶¹ Full harmonisation and consolidation of the servers was expected to be achieved in the course of 2019, which will facilitate synchronisation, as IMSMA reports will be sent directly to LMAC for approval, improving the accuracy and efficiency of the process. The integration will also help better protect data while decreasing maintenance costs.⁶²

Furthermore, LMAC is migrating from its current version of IMSMA (IMSMA NG) to IMSMA Core, which it hopes will help facilitate the production of clearer reports that can be translated into dashboards for stakeholders, including donors, to monitor and follow.⁶³ Migration to IMSMA Core requires regular IMSMA backups and corrections to data. Migration is forecast to be achieved only in 2020.⁶⁴

As previously mentioned in the "Understanding of Contamination" section, the current baseline of CMR contamination in LMAC's information management system is not considered reliable, principally because the size of many hazardous areas in the database do not accurately reflect the actual extent of contamination. Some clearance tasks result in a clearance output in excess of the task size originally recorded in IMSMA, often due to fadeout. LMAC has reported that the system for database entry now more accurately reflects operational data.⁶⁵ Now, any area cleared in excess of the original task size is no longer recorded as additional tasks in the database, but as "productivity".⁶⁶

In addition, in IMSMA, hazardous areas which have no defined boundaries, are now recorded as an average/standard polygon size of 10,000m². In reality, some of these areas are found to be substantially larger than the 10,000m² recorded, while others contain no CMR at all.⁶⁷ Since 2018, LMAC has been actively expanding application of non-technical and technical survey of CMR-contaminated areas, which will better determine the actual baseline of remaining CMR contamination.⁶⁸

During clearance, a single task may not always be completed in a single assignment. Instead, clearance of separate sections of the task, such as the "fade-out" area or the "disclaimed" area (area for which permission is not granted for clearance, and which requires signed release papers), may be postponed in favour of higher priority/high-impact tasks elsewhere, and returned to at a later date. In such instances, the fade-out, disclaimed, and/or uncleared areas are marked as separate subtasks in the database, although they are linked through numerical labelling to the original task. Since 2016, disclaimed areas can be cleared without the landowner's permission.⁶⁹

Lebanon's latest revision of NMAS, published in March 2018, allows technical survey of CMR-contaminated areas. By May 2019, LMAC had updated data forms to allow for the correct reporting of land reduced through technical survey.⁷⁰

In 2018, LMAC changed requirements for clearance operators to report operational data monthly in favour of daily and weekly reporting instead. According to NPA, this has resulted in closer and more regular checks of data by LMAC and RMAC QA officers.⁷¹

PLANNING AND TASKING

In September 2011, LMAC adopted a strategic mine action plan for 2011–20.⁷² The plan called for clearance of all CMR by 2016, and for completion of mine clearance outside the Blue Line by 2020. Both goals are dependent on capacity, but progress has fallen well short of planning targets,⁷³ which will not be met.

A first interim review of the strategy was conducted in January–March 2014 to assess progress towards the 2013 milestone, and to adjust the 2016 and 2020 milestones accordingly. The review revealed that in 2011–13 CMR clearance was slow and suffered from underfunding (with consequently fewer operating teams), while previously unrecorded contaminated areas were identified, adding to the overall contamination estimate.⁷⁴

A second interim assessment, this time for 2014–16, was undertaken in 2016, but only released in March 2018. The results similarly highlighted the huge gap between actual output and planned BAC output (when compared to the original strategic plan). This second milestone assessment also reflected on the achievements, challenges, and lessons learned, offering recommendations that reflected available resources (financial and human), as well as a qualitative roadmap towards completion.⁷⁵

LMAC has planned to prepare a new strategic mine action plan by the end of 2019, which will also be aligned with Lebanon's planned extension request to its CCM Article 4 deadline of May 2021. The Article 4 extension request will be submitted for approval at the Second Review conference in 2020.⁷⁶

Lebanon has set four levels of priority for its land release. The first is to address infrastructure (e.g.

housing, roads, hospitals, and schools); the second is to address utilities (e.g. water, electricity, drainage, and telephone lines); the third is to release agricultural land and grazing areas for livestock; and the fourth is to release land for other activities (e.g. nature reserves or areas used by wildlife).⁷⁷ In some instances, task prioritisation is also influenced by requested specifications from donors, for example based on the geographical location.⁷⁸

LAND RELEASE SYSTEM

STANDARDS AND LAND RELEASE EFFICIENCY

Lebanon developed its first NMAS in 2010.⁷⁹ Over the last two years, LMAC worked with UNDP and other partners, under a project funded by the EU, to revise the standards.⁸⁰ The aim of the revision has been to enhance efficiency by harmonising national standards with IMAS, as well as to add new modules not present in the original NMAS.⁸¹ LMAC adopted a consultative and constructive approach to the NMAS revision process, liaising extensively with demining operators, who submitted comments and recommendations during the process.⁸² The revised NMAS, formally approved in March 2018, has a solid focus on land release and evidence-based decision-making, in line with the IMAS, and based on recommendations and analysis of operational data collected by the implementing agencies. Notable enhancements include reduction of the required clearance depth of CMR from 20cm to 15cm; the division of the 50 metres required fade-out into two zones (subsurface clearance at 15cm for the first 35 metres and visual surface clearance for the remaining 15 metres, instrument aided where required for vegetation cutting), and enhancements in how rapid response tasks are addressed and recorded.⁸³ In addition, and of particular significance, the new NMAS allow technical survey to be used for CMR tasks, which was successfully trialled with the use of explosives detection dogs (EDDs) in 2018.⁸⁴ These changes should dramatically improve the efficiency of CMR land release in Lebanon.⁸⁵

In March 2018, the new NMAS were presented to operators during a workshop at the RSHDL, during which LMAC/RMAC discussed next steps in operationalising the new standards.⁸⁶ Demining NGOs have updated their standing operating procedures (SOPs) according to the new NMAS.⁸⁷ LMAC views the NMAS as living documents, which will need regular updating to ensure they keep track with developments in IMAS, while also taking into consideration field experiences in Lebanon.⁸⁸ For example, the standards will need to be updated, or an addendum added, to include the use of EDDs for technical survey of CMR.⁸⁹

Historically, clearance tasks assigned to operators by LMAC were typically deemed to already reflect non-technical survey data, and LMAC did not formally permit operators to conduct additional survey on assigned tasks prior to clearance.⁹⁰ However, over the course of the period since November 2016's CCM Article 4 workshop, clearance operators have been permitted to cut lanes directly into the CHA and not from

the Universal Transverse Mercator (UTM) coordinates resulting from the original non-technical survey, which in some cases is as far as 300 metres from the contaminated area.⁹¹ Clearance operators can also now seek permission to walk onto CMR task sites after surface clearance, before undertaking subsurface clearance, which means that BAC methodologies can now be better employed.⁹²

Furthermore, operators now have an opportunity to discuss specific land release considerations with LMAC/RMAC for assigned clearance tasks, which arise during the pre-clearance assessment stage of operations. Such discussions might result in the refining of the task size or approved land release specifications (e.g. use of technical survey, for all or part of the task, rather than full clearance).⁹³

Since the release and implementation of the revised NMAS, national authorities in Lebanon have actively promoted the use of non-technical survey and technical survey on cluster munition sites, in order to define the presence or absence of an explosive threat.⁹⁴ This is evidenced by deployment of MAG and NPA teams to conduct non-technical survey of new contamination in the north-east region of Lebanon, bordering Syria,⁹⁵ and also the contracting of both organisations to conduct non-technical survey in southern Lebanon. Until then, the only non-technical survey capacity that was permitted was that of the LAF. New technical survey of CMR tasks began in 2018 through NPA's technical survey pilot project using EDDs. These measures will help ensure an increasing number of tasks will be released back to the local community.⁹⁶

There is, however, still significant potential to increase the use and capacity of non-technical survey and technical survey on cluster munition sites, to determine the presence or absence of CMR contamination.⁹⁷ LMAC has planned for technical survey to become a central part of its planning in 2019,⁹⁸ both through use of EDDs and manually.

OPERATORS

In 2018, CMR clearance was conducted by international operators DCA, MAG, and NPA; national operators POD and LAMINDA; and the Engineering Regiment of the LAF. Clearance capacity fluctuated throughout 2018, but averaged 21 clearance teams (five DCA teams; five MAG teams, four NPA teams, four POD teams, one LAMINDA team, and two LAF teams).⁹⁹

All LAF engineering companies have two teams of EOD-qualified personnel.¹⁰⁰ In addition, the LAF has two non-technical survey teams that were deployed in 2018.¹⁰¹

MAG deployed eight staff to conduct non-technical survey in 2018, in addition to one dedicated technical survey team of nine people.¹⁰² Previously, MAG had not been officially permitted to conduct survey, with the exception of the pre-clearance non-technical survey it conducted in 2013/14, with support from POD. MAG planned to maintain and increase capacity in 2019, and to increase use of newly introduced large-loop detectors and move more towards BAC methodologies, as and where appropriate.¹⁰³

NPA's technical survey pilot project team in south Lebanon comprises six technical staff: a supervisor, a team leader, two dog handlers and their EDDs, two manual searchers (for clearance capacity and for manual technical survey of area not appropriate for EDDs, such as areas of thick vegetation).¹⁰⁴ In addition, NPA deployed a further five non-technical survey personnel, supported by a technical field manager, to survey new contamination in the north-east region of Lebanon, bordering Syria.¹⁰⁵ NPA plans to increase its non-technical survey capacity in its south Lebanon operations throughout 2019.¹⁰⁶

OPERATIONAL TOOLS

Manual clearance is the primary method of clearing CMR in Lebanon, but machines are sometimes deployed to make access lanes and prepare the ground.¹⁰⁷

During 2017, LMAC began to explore the potential for the use of EDDs as a tool to accelerate the release of land contaminated with CMR.¹⁰⁸ Under an NPA pilot project for technical survey using dogs and manual assets, EDDs received accreditation and were deployed in April 2018.¹⁰⁹ The pilot project proved a success,¹¹⁰ and NPA's technical survey team is now fully integrated into NPA operations and is being tasked by the RMAC as follow-up to previous non-technical survey, to confirm CMR contamination prior to areas being tasked for clearance.¹¹¹

One of the advantages of using EDDs is that dogs detect explosives, not metal, which can help speed up the technical survey process by avoiding unnecessary excavation of the scrap-metal signals that are generated by manual detectors. In addition to NPA's technical survey with EDDs, MAG and NPA are both conducting manual technical survey.¹¹²

MAG is the only international operator in Lebanon with mechanical assets to support manual clearance operations. These assets can be used by other organisations upon request to LMAC.¹¹³

As part of non-technical survey of the area on the north-east border of Lebanon, contaminated during spill-over of the Syrian conflict in 2014–17, drones were used for the first time, and proved very helpful in helping inform survey efforts.¹¹⁴

LAND RELEASE OUTPUT AND ARTICLE 4 COMPLIANCE

LAND RELEASE OUTPUT IN 2018

A total of 1.27km² of CMR-contaminated area was released in 2018, of which 1.15km² was cleared, 0.1km² was reduced by technical survey, and 0.02km² was cancelled by non-technical survey.

In addition, 0.84km² of new CMR contamination was added to the database in 2018, following non-technical survey in Arsal, in the north-east of Lebanon bordering Syria.

SURVEY IN 2018

In 2018, 103,000m² was reduced through technical survey [see Table 2].¹¹⁵ A further 20,314m² of newly suspected area in the Arsal region on the north-east border with Syria was cancelled through non-technical survey by MAG.¹¹⁶ In addition, the non-technical survey of the Arsal area, which commenced in July 2018, and was also conducted by NPA, resulted in 84,079m² identified as being CMR-contaminated.¹¹⁷ Technical survey and clearance of this area is planned for 2019.

Survey output in 2018 marked an increase compared to 2017, when no land was released by survey and when only the LAF were permitted to conduct non-technical survey.

Table 2: Reduction by technical survey in 2018¹¹⁸

Operator	Area reduced (m ²)
MAG	25,000
NPA	78,000
Total	103,000

MAG reported that it is performing 30% technical survey of low-threat cluster munition sites, which were previously recommended for cancellation through non-technical survey in 2013–14. In areas of the West Bekaa, where there are no CMR evidence points, just large polygons (from 1980s contamination), MAG is conducting technical survey of the whole site to determine where clearance is required and where land can be reduced through technical survey.¹¹⁹

Under the NPA pilot project for technical survey with the use of EDDs, the EDDs received accreditation in April 2018, and were deployed on the first technical survey task at the end of that month.¹²⁰ As part of the pilot project, non-technical survey is systematically conducted before technical survey and deployment of the EDDs.¹²¹ NPA reported that its technical survey pilot project with EDD, focused on five tasks suspected to contain CMR, found CMR contamination in only three of the tasks. In total, 29,860m² were subjected to technical survey, of which 4,185m² were quality controlled.¹²² The NPA pilot project is focused on cluster munition tasks where the location of submunitions had not been specified through non-technical survey. The pilot project tasks were inspected by quality control (QC) teams to evaluate the performance of the EDDs.¹²³

CLEARANCE IN 2018

Lebanon reported clearing just under 1.15km² of CMR-contaminated land in 2018, destroying in the process 3,583 submunitions (see Table 3).¹²⁴ This includes 119 submunitions destroyed during rapid response/EOD spot tasks in 2018.¹²⁵ Clearance in 2018 was slightly down compared to the 1.41km² of CMR-contaminated land cleared in 2017.¹²⁶ Clearance rates are influenced by the type of terrain and the depth of CMR, which in some locations is deeper than 15cm.¹²⁷

Table 3 above includes the destruction of submunitions during spot tasks in 2018, including 2 submunitions found in spot tasks conducted by MAG, 4 by NPA, and 101 submunitions by POD.¹²⁸

LMAC reported that eight CHAs were cleared in 2018, which proved to contain no CMR. LMAC hopes that introduction of technical survey for areas suspected to be CMR-contaminated, should help prevent unnecessary full clearance of areas which prove not to be contaminated.¹²⁹

Table 3: Clearance of CMR-contaminated area in 2018¹³⁰

Operator	Area cleared (m ²)	Submunitions destroyed	Other UXO destroyed
DCA	394,120	1,457	10
MAG	269,082	271	100
NPA	193,720*	598	2
POD	175,241	497	0
LAMINDA	67,460	277	37
LAF	47,715	483	11,097
Totals	1,147,338	3,583	11,246

* 163,860m² of battle area clearance and 29,860m² cleared during EDD technical survey.¹³¹

ARTICLE 4 DEADLINE AND COMPLIANCE

CCM ENTRY INTO FORCE FOR LEBANON: 1 MAY 2011

ARTICLE 4 DEADLINE: 1 MAY 2021

ON TRACK TO MEET ARTICLE 4 DEADLINE: NO

Under Article 4 of the CCM, Lebanon is required to destroy all CMR in areas under its jurisdiction or control as soon as possible, but not later than 1 May 2021. Lebanon is not on track to meet this deadline and plans to submit an Article 4 extension request for consideration at the Second CCM Review Conference in 2020.

Originally, clearance of CMR-contaminated land had been expected to be completed by the end of 2016, in accordance with the 2011–20 national strategy.¹³² However, meeting this target was contingent on securing the number of BAC teams needed, which did not happen, and progress against the strategy has fallen well behind schedule.¹³³

In total, more than 8km² of CMR contamination has been cleared in the last five years (see Table 4 below).

Table 4: Five-year summary of CMR clearance (2014–18)

Year	Area cleared (km ²)
2018	1.15
2017	1.41
2016	*1.90
2015	1.69
2014	2.10
Total	8.25

* In addition, a further 99,641m² of re-clearance was conducted.

LMAC predicts that the addition of eight new BAC teams in 2019, thanks to national funding for CMR clearance for five years, will result in an increase in total annual clearance output to 1.67km² per year.¹³⁴

Progress in land release is expected to be accelerated by adoption of better land release procedures in 2018, as enshrined in the revised NMAS. Crucially, LMAC's demonstrated commitment to promote and implement use of non-technical and technical survey on cluster munition-contaminated areas will help to cancel or reduce areas more efficiently.¹³⁵

As at April 2019, LMAC envisaged that, based on current capacity (including the eight new BAC teams, funded by Lebanon), it will take until 2025 to complete CMR clearance in Lebanon.¹³⁶ In its Article 7 report (for 2018) Lebanon says it could take as long as ten years, based on current average output, and that an increase in the number of teams to forty, would reduce completion to three years.¹³⁷ However, LMAC still needs to more accurately determine the baseline of CMR contamination through increased survey, which it is in the process of conducting and only then will it be able to determine a more accurate timeline for completion of its Article 4 obligations.

There is a concern that funding in some cases risks being diverted from BAC towards other objectives, such as mine clearance on the Blue Line, or clearance in the north-eastern border with Syria.¹³⁸ Furthermore, LMAC reported that donors mostly look to fund clearance of high-impact sites, whereas many of the remaining CMR tasks are viewed as moderate or low impact. LMAC is, however, encouraging donors to maintain funding to help it complete CMR clearance and its CCM Article 4 obligations.¹³⁹ Discovery of new contaminated area and the impact of working in difficult terrains and extreme weather conditions, which slow down clearance operations, were also cited as challenges in Article 4 implementation in Lebanon.¹⁴⁰

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- 2 Email from Maj. Fadi Wazen, LMAC, 7 March 2019; and LMAC, "2018 Annual Report Lebanon Mine Action Centre", p. 14.
- 3 Email from Maj. Fadi Wazen, LMAC, 31 May 2019.
- 4 Email from Maj. Fadi Wazen, LMAC, 7 March 2019. LMAC's "2018 Annual Report Lebanon Mine Action Centre", reports total baseline CMR contamination as 11,768,926m².
- 5 Email from Brig.-Gen. Ziad Nasr, LMAC, 9 June 2017.
- 6 Article 7 Report (for 2018), Form F.
- 7 Interview with Brig.-Gen. Elie Nassif (then) Director, and Brig.-Gen. Fakh, (then) Head of Operations, LMAC, Beirut, 18 April 2016; email from Maj. Fadi Wazen, LMAC, 7 March 2019; and Article 7 Report (for 2018), Form F.
- 8 Email from Maj. Fadi Wazen, LMAC, 7 March 2019; LMAC, "2018 Annual Report Lebanon Mine Action Centre", p. 13; and Article 7 Report (for 2018), Form F.
- 9 Article 7 Report (for 2018), Form F.
- 10 Email from Maj. Fadi Wazen, LMAC, 31 May 2019.
- 11 Interview with Oussama Merhi, (then) UNDP Mine Action Advisor for LMAC, in Geneva, 26 June 2015; and Article 7 Report (for 2015), Form F.
- 12 Interview with Oussama Merhi, UNDP, in Geneva, 26 June 2015.
- 13 Article 7 Report (for 2015), Form F; interview with Brig.-Gen. Elie Nassif and Brig.-Gen. Fakh, LMAC, Beirut, 11 May 2016; and email from Brig.-Gen. Ziad Nasr, LMAC, 24 April 2017.
- 14 Interview with Bekim Shala, (then) Programme Manager, MAG, Nabatiyeh, 14 April 2016.
- 15 Email from Eva Veble, (then) Lebanon Programme Manager, NPA, 8 July 2016.
- 16 Email from Maj. Fadi Wazen, LMAC, 31 May 2019.
- 17 Email from Brig.-Gen. Ziad Nasr, (then) Director, LMAC, 27 April 2018; and "Mine Action Forum: Action Points 1st Quarter Progress Report", circulated by Ariane Elmas, UNDP Mine Action Advisor for LMAC, 21 March 2018.
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- 19 MAG, "Cluster Munition Contamination in Lebanon using survey data", September 2014.
- 20 Email from Bekim Shala, MAG, 14 June 2016.
- 21 Email from Brig.-Gen. Elie Nassif, LMAC, 17 June 2015.
- 22 Email from Maj. Fadi Wazen, LMAC, 31 May 2019.
- 23 Interviews with Oussama Merhi, UNDP, in Geneva, 26 June 2015; and with Brig.-Gen. Elie Nassif and Brig.-Gen. Fakh, LMAC, Beirut, 11 April 2016; and emails from Brig.-Gen. Elie Nassif, LMAC, 14 May 2016; LMAC Operations Department, 3 July 2018; and Dave Wiley, MAG, 14 June 2018 and 7 March 2019.
- 24 Email from Maj. Fadi Wazen, LMAC, 31 May 2019.
- 25 Landmine Action, "Foreseeable Harm: the use and impact of cluster munitions in Lebanon: 2006", 2006.
- 26 Email from Brig.-Gen. Ziad Nasr, LMAC, 27 April 2018; and Article 7 Report (for 2018), Form F.
- 27 Interview with Brig.-Gen. Elie Nassif and Brig.-Gen. Fakh, LMAC, Beirut, 11 April 2016; presentation by Brig.-Gen. Fakh, LMAC, Beirut, 16 November 2016; and Article 7 Report (for 2018), Form F.
- 28 Landmine Action, "Foreseeable Harm: the use and impact of cluster munitions in Lebanon: 2006", 2006; interview with Brig.-Gen. Elie Nassif and Brig.-Gen. Fakh, LMAC, Beirut, 11 April 2016; and Article 7 Report (for 2016) Form F.
- 29 Emails from Maj. Fadi Wazen, LMAC, 7 March 2019; David Willey, Programme Manager, MAG, 7 March 2019; and Emile Ollivier, Grants Coordinator, NPA, 19 March 2019.
- 30 Article 7 Report (for 2018), Form F; and email from Maj. Fadi Wazen, LMAC, 7 March 2019.
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- 32 Email from Maj. Fadi Wazen, LMAC, 7 March 2019 and presentation in Beirut, 8 April 2018; and LMAC, "2018 Annual Report Lebanon Mine Action Centre", p. 14.
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- 34 LMAC, "Lebanon Mine Action Strategy 2011–2020", September 2011, p. 4.
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- 36 Interview with Brig.-Gen. Elie Nassif and Brig.-Gen. Fakh, LMAC, Beirut, 11 April 2016; and LMAC, "Lebanon Mine Action Strategy. Second Milestone Review 2014–2016", March 2018; and "Mine Action Forum: Action Points 1st Quarter Progress Report, March 2018".
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- 38 Email from Anna-Lena Schluchter, containing data from Rana Elias, Focal point for Lebanon, GICHD, 21 June 2017.
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- 41 Email from Rana Elias, GICHD, 17 June 2019.
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- 45 Expert workshop under the framework of supporting Lebanon in meeting its CCM Article 4 obligations, Beirut, 17 November 2016; expert workshop on cluster munition and landmine survey and clearance in Lebanon, Beirut, 17 January 2018; and LMAC, "2018 Annual Report Lebanon Mine Action Centre", p. 23.
- 46 Emails from Emile Ollivier, NPA, 19 March 2019; David Willey, MAG, 7 March 2019; and Mahmoud Rahhal, POD, 8 March 2019.
- 47 Emails from Emile Ollivier, NPA, 19 March 2019; and David Willey, MAG, 7 March 2019.
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- 50 Email from Maj. Fadi Wazen, LMAC, 31 May 2019.
- 51 Emails from Maj. Fadi Wazen, LMAC, 31 May and 7 June 2019; and interview, Beirut, 16 April 2019.
- 52 Email from Maj. Fadi Wazen, LMAC, 7 March 2019; and LMAC, "2018 Annual Report Lebanon Mine Action Centre", p. 23.
- 53 LMAC, "2018 Annual Report Lebanon Mine Action Centre", p. 17.
- 54 LMAC, "2018 Annual Report Lebanon Mine Action Centre", p. 5; and email from Major Fadi Wazen, LMAC, 7 March 2019;
- 55 Email from Maj. Fadi Wazen, LMAC, 7 March 2019.
- 56 LMAC, "2018 Annual Report Lebanon Mine Action Centre", pp. 5 and 19.
- 57 Emails from Emile Ollivier, NPA, 19 March 2019; David Willey, MAG, 7 March 2019; and Mahmoud Rahhal, POD, 8 March 2019.
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- 61 Email from Rana Elias, GICHD, 17 June 2019.
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- 66 LMAC, "2018 Annual Report Lebanon Mine Action Centre", p. 14; and interview with Maj. Ali Makki, LMAC, Beirut, 16 April 2019.
- 67 Email from David Willey, MAG, 7 March 2019.
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- 69 Email from Brig.-Gen. Elie Nassif, LMAC, 5 July 2016.
- 70 Email from Maj. Fadi Wazen, LMAC, 31 May 2019.
- 71 Email from Emile Ollivier, NPA, 19 March 2019.
- 72 LMAC, "Lebanon Mine Action Strategy 2011–2020", September 2011, p. 4.
- 73 Response to Cluster Munition Monitor questionnaire by Brig.-Gen. Imad Odiemi, LMAC, 2 May 2014.
- 74 LMAC, "Mid-term Review to Strategy 2011–2020, Milestone 2013", August 2014.
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- 76 Interview with Maj. Fadi Wazen, Beirut, 16 April 2019.
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- 78 Interview with Maj. Fadi Wazen, LMAC, Beirut, 16 April 2019.
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- 81 Emails from Brig.-Gen. Elie Nassif, LMAC, 7 July 2015; and Rory Logan, NPA, 20 April 2015.
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- 83 Emails from Brig.-Gen. Ziad Nasr, LMAC, 27 April 2018; Craig McDiarmid, NPA, 17 April 2018; and Dave Wiley, MAG, 27 April 2018; and LMAC, "2018 Annual Report Lebanon Mine Action Centre", p. 17.
- 84 Emails from Brig.-Gen. Ziad Nasr, LMAC, 27 April 2018; Craig McDiarmid, NPA, 17 April 2018; Maj. Fadi Wazen, LMAC, 7 March 2019; and Emile Ollivier, NPA, 19 March 2019.
- 85 "Mine Action Forum: Action Points 1st Quarter Progress Report, March 2018"; LMAC, "2017 Annual Report Lebanon Mine Action Centre", undated; and emails from Dave Wiley, MAG, 27 April 2018; and Craig McDiarmid, NPA, 17 April 2018.
- 86 Emails from Brig.-Gen. Ziad Nasr, LMAC, 27 April 2018; Craig McDiarmid, NPA, 17 April 2018; and Dave Wiley, MAG, 27 April 2018.
- 87 Emails from Emile Ollivier, NPA, 19 March 2019; David Willey, MAG, 7 March 2019; and Mahmoud Rahhal, POD, 8 March 2019.
- 88 Expert workshop on cluster munition and landmine survey and clearance in Lebanon, Beirut, 17 January 2018; and LMAC, "Lebanon Mine Action Strategy. Second Milestone Review 2014–2016", March 2018.
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- 91 Emails from Craig McDiarmid, NPA, 30 March 2017 and 17 April 2018; and David Willey, MAG, 7 March 2019.
- 92 Email from David Willey, MAG, 7 March 2019.
- 93 Interview with Brig.-Gen. Elie Nassif and Brig.-Gen. Fakhri, LMAC, Beirut, 11 April 2016; and with Maj. Fadi Wazen, LMAC, Beirut, 16 April 2019.
- 94 Emails from Dave Wiley, MAG, 27 April 2018; and Craig McDiarmid, NPA, 17 April 2018.
- 95 Emails from David Willey, MAG, 7 March 2019; and Emile Ollivier, NPA, 19 March 2019; and LMAC, "2018 Annual Report Lebanon Mine Action Centre", p. 14.
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- 97 Emails from Dave Wiley, MAG, 27 April 2018; and Craig McDiarmid, NPA, 17 April 2018.
- 98 Email from Maj. Fadi Wazen, LMAC, 7 March 2019.
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- 100 Email from LMAC Operations Department, 28 June 2018; and email from Maj. Fadi Wazen, LMAC, 7 March 2019.
- 101 Emails from Brig.-Gen. Ziad Nasr, LMAC, 27 April 2018; and LMAC Operations Department, 28 June 2018.
- 102 Email from David Willey, MAG, 7 March 2019.
- 103 Ibid.
- 104 Email from Emile Ollivier, NPA, 19 March 2019.
- 105 Ibid.
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- 107 Email from Maj. Fadi Wazen, LMAC, 7 March 2019.
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- 109 Email from Craig McDiarmid, NPA, 15 June 2018.
- 110 Email from Maj. Fadi Wazen, LMAC, 7 March 2019.
- 111 Email from Emile Ollivier, NPA, 19 March 2019.
- 112 Emails from David Willey, MAG, 7 March 2019; and Emile Ollivier, NPA, 19 March 2019.
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- 114 Presentation by Maj. Fadi Wazen, LMAC, at the RHDSL, Beirut, 8 April 2019.
- 115 Email from Maj. Fadi Wazen, LMAC, 7 March 2019.
- 116 Email from David Willey, MAG, 7 March 2019; and Article 7 Report (for 2018), Form F.
- 117 Email from Maj. Fadi Wazen, LMAC, 7 March 2019; and LMAC, "2018 Annual Report Lebanon Mine Action Centre", p. 12.
- 118 Email from Maj. Fadi Wazen, LMAC, 7 March 2019. NPA reported reducing 54,200m² through technical survey in 2018 (officially reported in January 2019), slightly lower than the 78,000m² reported by LMAC.
- 119 Email from David Willey, MAG, 7 March 2019.

- 120 Email from Craig McDiarmid, NPA, 15 June 2018.
- 121 Email from Craig McDiarmid, NPA, 17 April 2018; and telephone interview, 15 June 2018.
- 122 Email from Emile Ollivier, NPA, 19 March 2019.
- 123 Email from Brig.-Gen. Ziad Nasr, LMAC, 27 April 2018.
- 124 Email from Maj. Fadi Wazen, LMAC, 7 March 2019; LMAC, "2018 Annual Report Lebanon Mine Action Centre", pp. 10–11; and Article 7 Report (for 2018), Form F.
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- 128 Emails from David Willey, MAG, 7 March 2019; Emile Ollivier, NPA, 19 March 2019; and Mahmoud Rahhal, POD, 8 March 2019.
- 129 Email from Maj. Fadi Wazen, LMAC, 7 March 2019; and interview with Brig.-Gen. Jihad Bechelany, Director, and Maj. Fadi Wazen, LMAC, Beirut, 16 April 2019.
- 130 Email from Maj. Fadi Wazen, LMAC, 7 March 2019; LMAC, "2018 Annual Report Lebanon Mine Action Centre", pp. 10–11; and Article 7 Report (for 2018), Form F. MAG reported slightly different clearance data for 2018, with 269,082m² and destruction of 271 submunitions and 78 items of other UXO. Email from David Willey, MAG, 7 March 2019. NPA reported destruction of 602 submunitions and 3 other items of UXO, a very small variance on the 598 submunitions and 2 items of UXO reported for NPA by LMAC. Email from Emile Ollivier, NPA, 19 March 2019. POD reported clearing 184,641m² of CMR-contaminated areas with the destruction of 396 submunitions. Email from Mahmoud Rahhal, POD, 8 March 2019.
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- 133 LMAC, "Lebanon Mine Action Strategy 2011–2020", September 2011.
- 134 Email from Emile Ollivier, NPA, 19 March 2019.
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