

Image Cover Sheet

CLASSIFICATION

UNCLASSIFIED

SYSTEM NUMBER

140996



TITLE

VAPOUR DANGER FROM AN AREA CONTAMINATED BY 5.5" BE. CHEM. SHELL CHARGED HTV AND
0.1% PERSPEX

System Number:

Patron Number:

Requester:

Notes:

DSIS Use only:

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DCI Suffield
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Index

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24TH., JUNE, 43.

Date 26 Feb 98 Signature D. Kuseler
Appointment Unit EXPERIMENTAL STATION,
Fonction Unité SUFFIELD, ALBERTA.

FIELD EXPERIMENT NO. 137.

VAPOUR DANGER FROM AN AREA CONTAMINATED
BY 5.5" B.E. CHEM. SHELL CHARGED HTV AND 0.1% PERSPEX.

DEFENCE SCIENTIFIC INFORMATION SERVICE	
DEFENCE RESEARCH BOARD	
Date:	DEC 23 1952
From:	SFS
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Reference No.:	52/13927

OBJECT

To examine the vapour danger from an area contaminated by 5.5" B.E. Chem. Shell charged HTV plus 0.1% Perspex.

INTRODUCTION

Porton Memorandum No. 14 states that an expenditure of 25 rounds per 100 yd. square is the minimum that would be used operationally to produce a vapour hazard on a given target. It is predicted that such an expenditure would produce at 80°F. and wind speed 10 m.p.h. a C.T. of 350 for an exposure of 1 1/2 hours.

METEOROLOGICAL CONDITIONS

- Wind speed: 5-15 m.p.h. (Direction across the line of fire if possible)
- Ground surface temperature: (a) 60°F. - 80°F.
(b) Above 80°F.

SITE

Area C-3, Artillery target - grass covered if possible.

MATERIAL

390 rounds 5.5" B.E. Chem. Shell Mk. III charged HTV 12 p. (alloprene plus 0.1% Perspex). Charging to be dyed red. Shell to be fuzed 221.

Temperature of shell charging to be noted during shoot.

PROCEDURE

- A target zone 500 yds. (line of fire) by 300 yds. will be established. It will consist of a central target area 100 yds. square consisting of large jump cards on a 5 yd. grid surrounded by a frame of small cards on a 10 yd. grid. (Appendix 1).
- Slit trenches will be dug in the target area.
- Bubblers in triplicate will be placed:-
 - At a height of 27 ins. every 10 yds. along the three edges of the target area.
 - In trenches. Two sets.

- (c) At ten points (ground level and 27") near the edge of each trench.

Note: If wind is variable, bubblers will be placed around the target area, the positions being decided by the Chem. Section. If possible, intake points of bubblers to be arranged so that local contamination does not interfere with samples.

4. Two guns will engage the target zone at a range of 12,000 yds., firing on nine points of origin (Appendix 11) 21 rounds per gun per point of origin (rate rapid).
5. The guns will be spaced at 50 yds. If the wind is uncertain at the target, no correction will be made for drift of droplets and the shell will be fired to burst over each point of origin. At 10,000 yards, 50% of the shell should burst within 200 yds. of range. The proposed sweeping (See Appendix) will therefore cover the target zone with slight overlapping.
6. Injectors will be turned on immediately prior to firing and bubblers will be changed (a) as quickly as possible after cease fire (zero) and (b) at zero plus 30 mins. Injectors will be turned off at zero plus 90 mins. Further samples will be taken at zero plus two hours to zero plus $2\frac{1}{2}$ hours and at zero plus 24 hours to zero plus 25 hrs. or until vapour danger is negligible. The zero and 90 min. sample is determined by the observers' (gun crew) time of occupation.
7. Persistence tests will be made at zero plus 12 hours at points determined by P. & M.S. and Chem. S. and further tests will be made at times selected by them.
8. At cease fire an 18 pdr. gun will be positioned on a downwind section of the target area and men wearing impregnated panties, battle order and respirators will carry out gun drill at intervals during an occupation of $1\frac{1}{2}$ hours.
(This assumes a wind speed of 10 m.p.h. and a temperature of 80°F. The occupation period will be adjusted if the conditions during the trial differ from these). The men will then leave the area and continue to wear their clothes for a period of 4 hours.
9. Phys. S. will place other observers in the area carrying out various tasks and for various times of occupation. Number of men and times of occupation to be decided upon by Phys. S.
10. M.E.O. will report the number of shell going to graze.
11. The trial will be repeated at temperatures above 80°F.
12. Heights of burst will be taken from three points by P. & M.S.
13. The usual meteor data will be recorded during whole period of the trial.
14. M.E.O. will provide the necessary trenches, each trench to be approximately 5 ft. deep and large enough to accommodate one man.

ADMINISTRATION

Section in charge of trial - M.E.O.

Section responsible for final report - C.E.O.

C.E.O. Decision as to time of trial. Organization of transport.

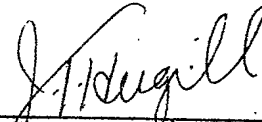
M.E.O. Preparing layout. Firing of shell. Collection of contaminated papers, number of shell going to graze.

P. & M.S. Control of sampling times, co-operation with Chem. S. in taking persistence tests, assessment of cards, meteor observations during trial. Report.

O.M. & E. Provision of shell. Temperature readings of shell chargings during shoot. Panorama of shell bursts relative to target area. Report.

Phys. S. Supervision and provision of observers as per Paras 8 and 9. Report

Chem. S. Vapour sampling. Report.



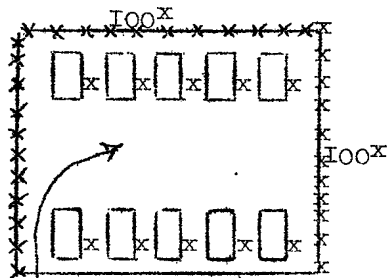
(J. P. Hugill) Major,
C.E.O.
Experimental Station.

JTH:JS

APPENDIX I

300^x

Small cards on 10^x grid.



Large cards on 5^x grid.

500^x

10 slit trenches (numbered)
one sampling point each.
3 bubblers 3' above floor.
2 small cards (numbered) in
each trench.

33 Sampling units at 10^x spacing
on three sides of target area.

3 bubblers to be operated
(1) during shoot (Approx. 60 mins.)
(2) cease fire (zero) to zero
+ 30 mins.
(3) zero + 30 mins. to zero +
1 1/2 hrs. (dependent on
Physiological observers.

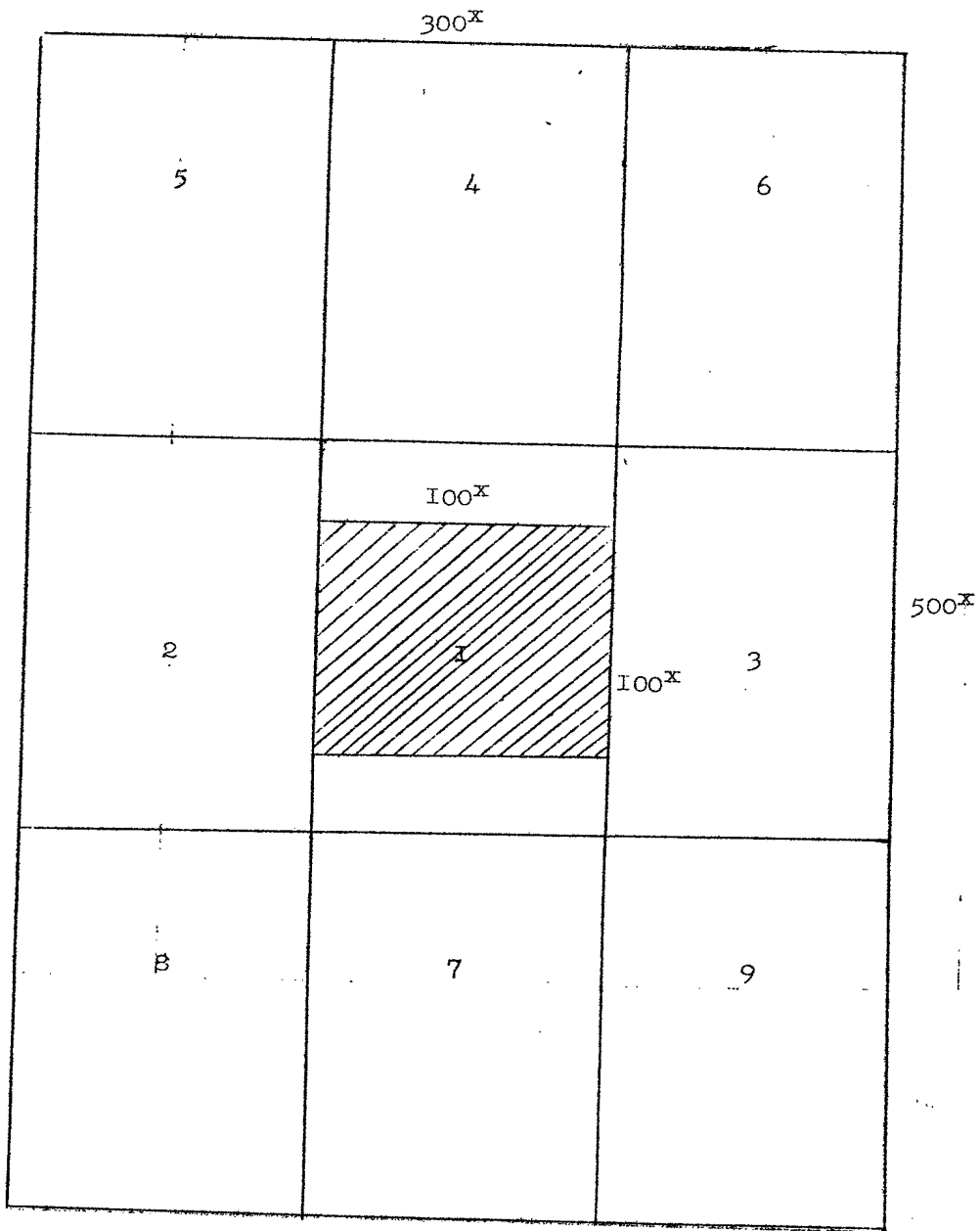
Further sampling at zero + 6 hrs.,
zero + 24 hrs. and until vapour
danger is negligible.

10 sampling points, 3 bubblers at
ground level and 3 at 27" - one
near edge of each trench.

Wind →

↑
Line of Fire

APPENDIX II



378 Rounds.

21 Rounds per gun per point of origin.

/////// = Target Area.

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