FILE FOLDER

DESCRIPTION ON TAB:

Wildfire, Weather & Towers

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DESCRIPTION:

Memorandum, Tower Orientation

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PRIORITY

P 041530Z APR 86

FM CG SECOND MARDIV

TO SECOND MARDIV

INFO CG FMFLANT CG II MAF
CG MCB CAMP LEJEUNE NC

UNCLAS //N01500//

SUBJ: TRAINING DURING FIRE CONDITION CLASS V

A. CG MCB CAMP LEJEUNE NC 021932Z APR 86
B. MCB CAMLEJ ORDER BO P11102.1
C. MCB CAMLEJ ORDER BO 11320.1G
D. FONECON BETWEEN LTCOL HUMBLE, G-3TRNG AND LTCOL DINEEN, MCB CAMLEJ RANGE CONTROL, 3 APR 86

1. REF A SET FIRE CONDITION CLASS V (FIRE DANGER EXTREME) FOR THE CAMP LEJEUNE AREA, WITH CONDITIONS REACHING "BLOWUP ALERT" STATUS AT VARIOUS INTERVALS. DURING FIRE CONDITION CLASS V, CG MC BASE CAMP LEJEUNE, VIA REFS B AND C, REQUIRES THE FOLLOWING PRECAUTIONS/ACTIONS BE TAKEN:
   A. ALL TRAINING IN FORESTED AREAS BE SUSPENDED.
   B. ANY ACTIVITIES LIKELY TO START FIRES BE SUSPENDED.

2. IAW REF D, SMALL ARMS LIVE FIRE TRAINING INTO G-10, K-2, AND N-1 IMPACT AREAS MAY CONTINUE ON APPROVAL FROM BASE RANGE CONTROL. NO ILLUMINATION, WP, OR TRACER AMMUNITION CAN BE USED DURING FIRE CONDITION CLASS V.

3. WHILE FORESTED AREA FIELD TRAINING IS SUSPENDED, COMMANDERS ARE ENCOURAGED TO USE TLZ'S AND BEACH AREAS TO PURSUE TRAINING PROGRAMS. ADDITIONAL GUIDANCE ON TRAINING IN FORESTED AREAS WILL

TRNG(2)...INFO FOR CG MCB CAMP LEJEUNE(117) /04/
BCOS(1) BSDO(1) OICB(1) CEOB(1) SSTF(85) GSTF(12) OCDR(14)

G-3(1)...INFO FOR CG II MAF(6) 01500/ 1/0008
CFU(1) G-1(1) G-2(1) SOG(1) S-S(1)

RTD:000-000/COPIES:0123

809830/094 1 OF 2 MATA0324 094/18:11Z 041530Z APR 86
CSN:RDVR00077 CG SECOND MARD

UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU
U UNCLASSIFIED U
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BE FORTHCOMING.

4. COMMANDERS ARE TO ENSURE PRUDENT FIRE PREVENTION PRECAUTIONS ARE TAKEN IN AUTHORIZED TRAINING/FIELD FIRING EVOLUTIONS WHILE FIRE CONDITION CLASS V STATUS IS IN EFFECT. UNITS WILL HAVE AN APPROPRIATE FIRE FIGHTING DETAIL DESIGNATED AT EACH RANGE IN USE AND THE SMOKING LAMP WILL BE OUT DURING ALL FIELD TRAINING. REPORT ALL FIRES IMMEDIATELY TO BLACKBURN 38.60.

5. THIS IS A COORDINATED CG MCB CAMP LEJEUNE/CG 2D MARDIV MESSAGE.

BT

USMC Forest Fire Control Training

November 19, 1985

0900 - 0930	Introduction	USMC
0930 - 1000	Terminology	Carl Turner
1000 - 1015	Break	
1015 - 1115	Fire Behavior	Gil Green
1115 - 1130	Break	
1130 - 1200	Fire Behavior	Gil Green
1300 - 1330	Fire Behavior	Gil Green
1330 - 1400	Suppression	~~Buddy Gates~~
1400 - 1415	Break	
1415 - 1515	Suppression	~~Buddy Gates~~
1515 - 1530	Break	
1530 - 1615	Mop Up	Carl Turner

November 20, 1985

0900 - 0930	Mop Up	Carl Turner
0930 - 1000	Safety	~~Buddy Gates~~
1000 - 1015	Break	
1015 - 1045	Safety	~~Buddy Gates~~
1045 - 1100	Organization Coop/NCFS/USMC	Gil Green

NATURAL RESOURCES AND ENVIRONMENTAL AFFAIRS DIVISION
Base Maintenance Department
Marine Corps Base
Camp Lejeune, North Carolina 28542

MAIN/KCH/th
11010

From: Base Forester
To: Base Maintenance Officer
Via: Director, Natural Resources & Environmental Affairs Division

Subj: Woods fire; report of

Date of fire 10/16/84 Class Day 1

Time of First Report 1330 Wind Speed & Direction 6-8 SE

Time First Unit on Scene 1400 Time First Attack 1445

Equipment and/or Men Required to Control Fire 9-1, 9-3, 9x11, 9x12, 9-2C, EOD

Time Fire Secured 1545 Estimated Acreage Burned 10

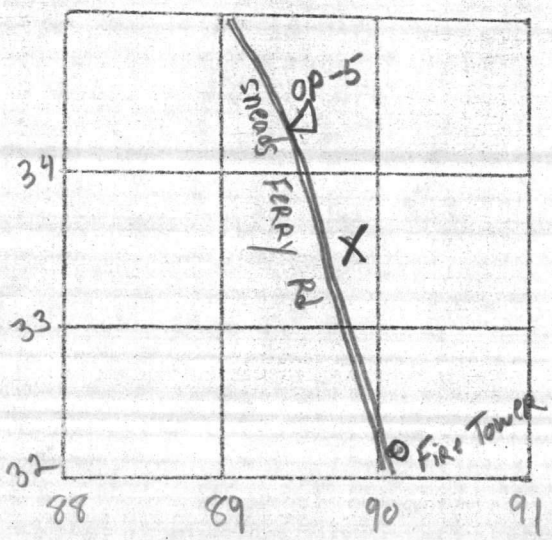
Time Last Unit Returned to Quarters 1600

Probable Cause of Fire Unknown

Estimated Damage — ac. Young Growth — ac. Pole Timber — ac. Mature Timber

Follow-up Procedures Required (Salvage, Planting, etc.) None

Estimated Damage $ — Location of Fire (Compt.) 32



GRID 897335

LOCATION G-10 Buffer between OP5 & Fire Tower 3

KENNETH C. HARRISON

NATURAL RESOURCES AND ENVIRONMENTAL AFFAIRS DIVISION
Base Maintenance Department
Marine Corps Base
Camp Lejeune, North Carolina 28542

MAIN/KCH/th
11010

From: Base Forester
To: Base Maintenance Officer
Via: Director, Natural Resources & Environmental Affairs Division

Subj: Woods fire; report of

Date of fire 28 JUNE 84 Class Day 1

Time of First Report 0542 Wind Speed & Direction 7 SE

Time First Unit on Scene 0559 Time First Attack 0559

Equipment and/or Men Required to Control Fire B-54L-55 W/TWO MEN

Time Fire Secured 0650 Estimated Acreage Burned ~~$~~ AC

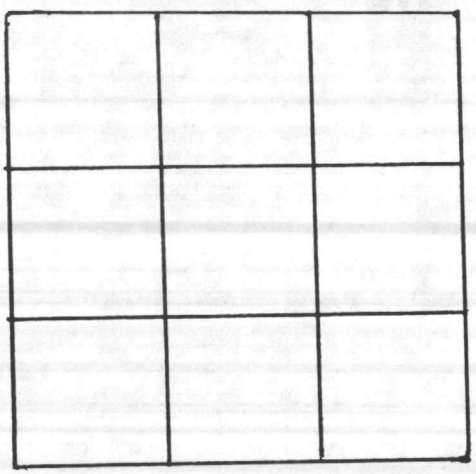
Time Last Unit Returned to Quarters 0714

Probable Cause of Fire EOD setting off C-4

Estimated Damage _____ ac. Young Growth _____ ac. Pole Timber _____ ac. Mature Timber

Follow-up Procedures Required (Salvage, Planting, etc.) _____

Estimated Damage $ _____ Location of Fire (Compt.) 32



GRID 34.8-89.7

LOCATION OP-5

MCBCL 1710/9

To P. Block

[handwritten initials] 12-12-83
AC/S Fac advised as part of weekly events

NATURAL RESOURCES AND ENVIRONMENTAL AFFAIRS DIVISION
Base Maintenance Department
Marine Corps Base
Camp Lejeune, North Carolina 28542

MAIN/KCH/th
11010

From: Base Forester
To: Base Maintenance Officer
Via: Director, Natural Resources & Environmental Affairs Division

Subj: Woods fire; report of

Date of fire 12-1-83 Class Day 1

Time of First Report 1410 Wind Speed & Direction NW 8-12

Time First Unit on Scene 1428 Time First Attack 1430

Equipment and/or Men Required to Control Fire Boondocker 6-5, 1-7
9-1, 9-3, 9-4, 33, 79, 9x10, 9x11, 9x12

Time Fire Secured 1549 Estimated Acreage Burned 51

Time Last Unit Returned to Quarters 1655

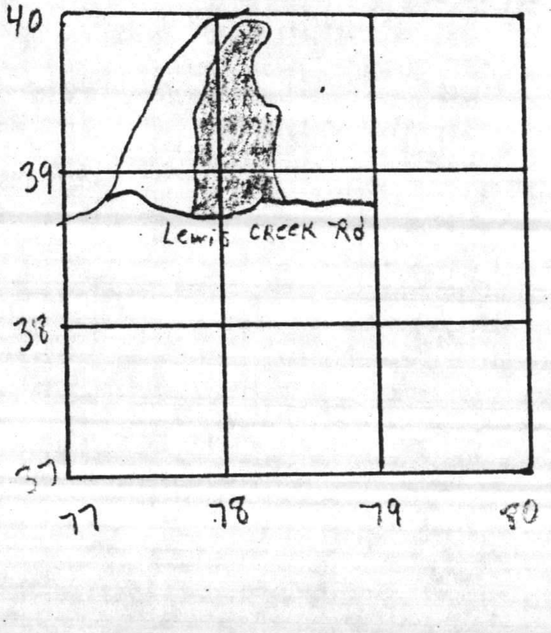
Probable Cause of Fire Troops

Estimated Damage 30 ac. Young Growth; ac. Pole Timber; ac. Mature Timber

1 YR OLD PLANTING

Follow-up Procedures Required (Salvage, Planting, etc.) 1345.80 Cost To replant; suppression cost 300.28; 1239.50 Damages (seedlings lost)

Estimated Damage $ 2885.58 Location of Fire (Compt.) 15



GRID 388 783

LOCATION North of Lewis CREEK Rd

MCBCL 1710/9

TOTAL DAMAGES RESULTING FROM WILDFIRE IN COMPT. 15 ON 1 DECEMBER, 1983. THE FIRE OCCURRED IN A 1 YEAR OLD LOBLOLLY PLANTATION.

1. COST OF REGENERATION CARRIED FORWARD FOR 1 YEAR AT 12% INTEREST COMPOUNDED SEMI ANNUALLY	$1,239.50
2. COST TO RE-ESTABLISH REGENERATION	1,345.80
3. SUPPRESSION COST	300.28
TOTAL COST	2,885.58

COST OF REGENERATION ESTABLISHED FY-83

Assumptions:

1. 30 acres ; 1 year old planted loblolly
2. 454 seedlings/acre

   14,000 seedlings needed @ 17.50/thousand
3. 21.07/ac. for tree planter, operator and fuel
4. 7.66/ac. for forestry labor.

Costs/Acre

$8.16 pine seedlings/acre
$21.07 Planter, tractor & operator/acre
$1.66 forestry labor/acre
$36.89 Cost per acre

Total Cost

$36.89 per acre
30 Acres
1,106.70 total cost to establish in 1983

TOTAL $ LOSS to fire which occurred on 1 December, 1983 in 1 year old loblolly plantation

Assumptions

1. 10% interest
2. V_N = Future value
3. V_0 = Present Value
4. interest compounded semi-annually

$V_N = V_0(1 + \frac{i}{2})^{1x2}$

$V_N = 1,106.70\ (1+.06)^2$

$V_N = 1,106.70\ (1.06)^2$

$V_N = 1,106.70\ (1.12)$

$V_N = 1,239.50$

COST TO REPLANT IN 1985

Assumptions

1. 30 ACRES
2. 454 SEEDLINGS/ACRE

   19,000 SEEDLINGS NEEDED @ $9.00/THOUSAND
3. 27.50/ACRE TREE planter, operator & fuel
4. 8.50/ACRE for FORESTRY LABOR

COSTS/ACRE

$8.86 PINE SEEDLINGS/ACRE
$27.50 planter, operator, teacher & fuel/ACRE
$8.50 FORESTRY LABOR/ACRE
$44.86 COST/ACRE

TOTAL ESTIMATED COST

44.86 per ACRE
30 ACRES
1,345.80 total cost to REESTABLISH IN 1985

Suppression Cost

1. Cost of Forestry Crew — 49.35

Forestry (Regular Hours + H.O)

GS-6(1): 2 hours @ 8.91 = $17.82

GS-5(2): 2 hours @ 8.26 = $16.52

Forestry (OT & HD)

GS-6(1): ½ hour @ 13.36/hr. OT + 2.22/hr HD = $7.79

GS-5(2): ½ hour @ 12.39/hr. OT + 2.06/hr HD = $7.22

2. Cost of Heavy Equipment Labor — 122.39

LWG-10: 2 hours @ 15.17 = $30.34

LWG-10: 2 hours @ 15.17 = $30.34

WG-8: 2 hours @ 12.79 = $25.58

H.E. (OT & HD)

LWG-10: ½ hour @ 22.75/hr. OT + 3.79/hr. HD = $13.27

LWG-10: ½ hour @ 22.75/hr. OT + 3.79/hr HD = $13.27

WG-8: ½ hour @ 19.18/hr OT (No Hazard Duty) = $9.59

3. Heavy Equipment Costs — 38.54

TD-12 @ 10.80 (fuel) × 1½ hours = $16.20

TD-12 @ 10.80 (fuel) × ½ hour = $5.40

Haul Unit @ 6 MPG for 40 miles = 7 gals @ 1.21/gal = $8.47

Haul Unit @ 6 MPG for 40 miles = 7 gals @ 1.21/gal = $8.47

4. Misc. Costs — 90.00

Fuel Forestry Fleet: $30.00

Maint. Forestry Fleet: $10.00

Maint. Fire Trackers: $30.00

Maint. & Haul Units: $20.00

Total Suppression Costs = 300.28

Total damages result from fire in Compartment 43 on 28 June 1983. The fire occurred in 6 year old planted Loblolly Pine.

1.	Cost of regeneration brought forward 6 years at 12% semi-annually	$8,001.74
2.	Cost to re-establish regeneration	3,033.70
3.	Suppression Costs	675.01

Total Damages $11,710.45

Cost of Regeneration in 1977.

Assumptions

1. 46 Acres

2. Cost of Seedlings: 216.00 total
   a. 8x12 spacing
   b. $9.00/M

3. 76.60/Acre labor costs
   a. 6-WG2 laborers
   b. 1-GS4 Crew Leader
   c. Vehicle and fuel
   d. Overhead

4. Drum Chop @ 8.84/acre
   a. 16.95/hour for labor and equipment
   b. 24 hours to accomplish job

Cost/Acre

$ 4.69	Pine Seedlings/Ac.
76.60	Labor/Ac.
8.84	Site prep/Ac.
$90.13	

$90.13/Acre
46 acres

$4,145.98 Cost to establish in 1977

Interest Compounded for 6 years (1977 to 1983) computed semi-annually at 12% interest.

$$V_N = V_O(1 + {}^{i}/_{2})^{6 \times 2}$$

V_N = Future Value

V_O = Present Value

i = 12%

$$V_N = 4{,}145.98(1 + {}^{.12}/_{2})^{12}$$

$$V_N = 4{,}145.98(1 + .06)^{12}$$

$$V_N = 4{,}145.98(1.06)^{12}$$

$$V_N = 4{,}145.98(1.93)$$

$$V_N = 8{,}001.74$$

8,001.74 lost by fire from 1977 regeneration cost.

Cost to establish plantation 1983

Assumptions

1. 46 acres

2. Cost of seedlings: $367.50
   a. 7 x 14 spacing
   b. 17.50/M

3. 21.07/Ac. to pull tree planter

4. 7.66/Ac. Forestry labor for planter

5. 18.64/Ac for roll chop

6. 10.60/Ac for bedding

Cost/Acre

$ 7.98	Pine seedlings/Ac.
21.07	Planter, tractor and operator/Ac.
7.66	Forestry Labor/Ac.
10.60	Bedding/Ac.
$65.95	

65.95/AC regeneration cost
46 Acres

3,033.70 cost to establish in 1983

Suppression Costs

Forestry (includes Hazard Duty Pay)

GS-9(5) @ 13.78/Hr * 4 Hrs	55.12
GS-9(1) @ 12.16/Hr * 4 Hrs	48.64
GS-5(2) @ 8.30/Hr * 5 Hrs	41.50
GS-4(1) @ 7.17/Hr * 5 Hrs	35.85
GS-4(1) @ 7.17/Hr * 5 Hrs	35.85
GS-4(1) @ 7.17/Hr * 5 Hrs	35.85
	$252.81

Heavy Equipment (includes Hazard Duty)

WG-10 @ 18.12/Hr * 4 Hrs	72.48
WG-10 @ 18.12/Hr * 5 Hrs	90.60
WG-8 @ 16.18/Hr * 4 Hrs	64.72
	$227.80

H. E. Cost

TD-12 @ 10.80 (Fuel) * 3 Hrs	32.40
TD-12 @ 10.80 (Fuel) * 3 Hrs	32.40
Haul Unit @ 9.80	9.80
Haul Unit @ 9.80	9.80
	84.40

Misc. Cost

1. Fuel Forestry Trucks	50.00
2. Maintenance forestry trucks	10.00
3. Maintenance Fire tractors	30.00
4. Lowbed Maintenance	20.00
	$110.00

Estimated Suppression Cost: $675,01

NATURAL RESOURCES AND ENVIRONMENTAL AFFAIRS BRANCH
BASE MAINTENANCE DIVISION
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA 28542

15 Dec 81
Date

From: Director
To: Ken

Subj:

1. I found attached on my desk. Based on Col Mounts instruction we will respond to all fires requiring fire plow — Also two plows will be dispatched. As I recall we have discussed and this is probably already being done.

Julian

10 Nov 81

Fires

The only thing I would suggest NREA we respond. To would be those fires requiring a fire plow.

WHO DETERMINES FIREPLOW NEED

11-10-81

Julian:

For information we have a lot of these. If we responded to all fires of this type we would have to keep someone on standby.

Ken

NAV 5216/144 (REV. 6-70)
N 0107-LF-778-8099

DEPARTMENT OF THE NAVY

Memorandum

DATE: 22 May 1980

FROM Director, Natural Resources and Environmental Affairs Division

TO Base Maintenance Officer

SUBJ Forest Fire Equipment and Training Needs

Short Range

1. Work out some type of standby or rapid response system for initial attack with the fire tractors, helicopter bucket and other equipment we now have.

2. Assign responsibilities for operation, maintenance and repair of equipment: Pre-attack/Attack/Post attack

3. Equip all Base Maintenance tractors with hardware for pulling a fire plow in case of breakdowns, etc.

4. Carry spare parts on tractors such as hydraulic hose, couplings, etc. that commonly need replacing with tools to make the minor repairs.

5. Have a repair truck stocked with additional parts, cables, clamps, tools, etc. for dispatch to the fire if needed.

6. Equip all low-beds with air or hydraulic ramps for transporting equipment.

7. Dispatch fuel truck to large fires.

8. Dispatch a mechanic to large fires.

9. Have all personnel → NREA Div. in some position(s) in the fire control organization.

10. Have some key personnel in other Base Maintenance Divisions assigned to perform in supply and service functions.

11. Get radios with PA speakers installed in primary fire tractor units.

12. Have PA speakers installed in forestry vehicles.

13. Have radio call numbers assigned for all permanent personnel.

Long Range

1. Acquire low ground pressure tractors with hauling units for fire control and other management work.

2. Have all tractors and hauling units completely equipped with radios, spare parts, etc.

3. Have all tractors and hauling units assigned a radio call sign.

4. Have radio call signs painted on top of all equipment for spotter aircraft identification.

5. Have a radio monitoring system for the forestry frequency installed in the Base Fire Dispatchers Office.

6. Lease a teletype for forest fire weather forecasts - hookup to Forest Fire Weather Forecaster - National Weather Service, Raleigh, NC.

7. Install a forestry radio in Dixon Fire Tower.

8. Install a forestry radio in Onslow County Ranger vehicle.

9. Send Forestry and other key personnel to Fire Training School in Kinston.

10. Send tractor operators to Forest Fire Operators Training School in Kinston.

JULIAN I. WOOTEN

Danny

North Carolina Department of Natural Resources & Community Development
James B. Hunt, Jr., Governor
Howard N. Lee, Secretary

June 24, 1980

Lt. Colonel T. R. Baisley
U. S. Marine Corps
Marine Corps Base
Camp LeJeune, North Carolina 28542

Dear Colonel Baisley:

John Shepherd and myself enjoyed visiting Camp LeJeune on May 22 and reviewing the forest fire suppression organization with Messrs. Wooten, Harrison, and Padgett.

We would like to offer the following suggestions as possible ways to strengthen the forest fire capability on the Marine Corps Base:

1. Responsibility for Forest Fire Suppression

At the present time, there appears to be a split responsibility for forest fire suppression. Essentially the Base Fire Chief has the responsibility for initial suppression action. If initial attack action fails, or if the fire cannot be reached with conventional wheel fire equipment, the responsibility is shifted to forestry. This could result (but not necessarily so) in a weaker initial attack effort.

Recommendation

It is recommended that the Base Fire Chief have sole responsibility for all fire suppression, including forest fire suppression. It is also recommended that Base Forester Ken Harrison and his staff be utilized in the role of Forest Resource Advisor to the fire boss in accordance with the U.S. Forest Service Fire Line Notebook.

2. Training

In order to suppress forest fires efficiently and effectively, training is needed in four areas. These areas are: (a)appropriate readiness; (b)initial attack; (c)strategy and tactics; and (d)fire organization. The N.C. Division of Forest Resources conducts training in all four areas either in New Bern at the District level or in Kinston at the Regional level.

Recommendation

It is recommended that appropriate personnel attend training schools in all four areas being conducted by the Division of Forest Resources at New Bern and Kinston. Tractor-plow operators should also attend a one-week basic forest fire equipment operator course and a one-week advanced forest fire equipment operator course. These courses are usually taught during September at Kinston.

3. Fire Suppression Equipment

Present plans for purchasing a D-4 and D-6 (LGP) tractors with swing wheel fire plows should be sufficient to handle the forest fire situation. Other construction tractors can be equipped to pull fire plows during emergency situations.

Recommendation

It is recommended that the two tractor-plow units be completely dedicated to forest fire suppression and be assigned to the Base Fire Department full time. Tractors designated as forest fire suppression units should not be utilized for other purposes. Once committed to other projects, tractors are very seldom ready for fire suppression when needed. It is also recommended that two additional construction tractors be equipped to pull fire plows.

4. Communications

All fire suppression equipment and supervisory personnel should be equipped with radios. A frequency common to all radios should be assigned as a forest fire suppression frequency. Radios are a necessity to direct suppression action and coordinate support activities. Communication ties with the Division of Forest Resources are desirable when mutual aid is being utilized.

Recommendation

It is recommended that a single frequency, common to all Natural Resources and Environmental Affairs radios and Base Fire Department radios be assigned as a forest fire suppression frequency. It is also recommended that a limited number of radios capable of operating on the N.C. Division of Forest Resources' frequencies be purchased to serve as tie-ins with the Forest Service. The following priority is suggested: (1)Base Maintenance Communications Center; (2)Fire Boss; (3)Line Boss; and (4)Suppression tractors.

5. Daily Weather Forecast and Use of National Fire Danger Rating System

Current fire weather forecasts are needed from the National Weather Service to stay abreast of changing weather conditions. Weather forecasts are required to anticipate fire behavior and compute projected National Fire Danger Ratings for manning guides. Fire Danger indices presently being used to determine class days are not the most appropriate indices available.

Recommendation

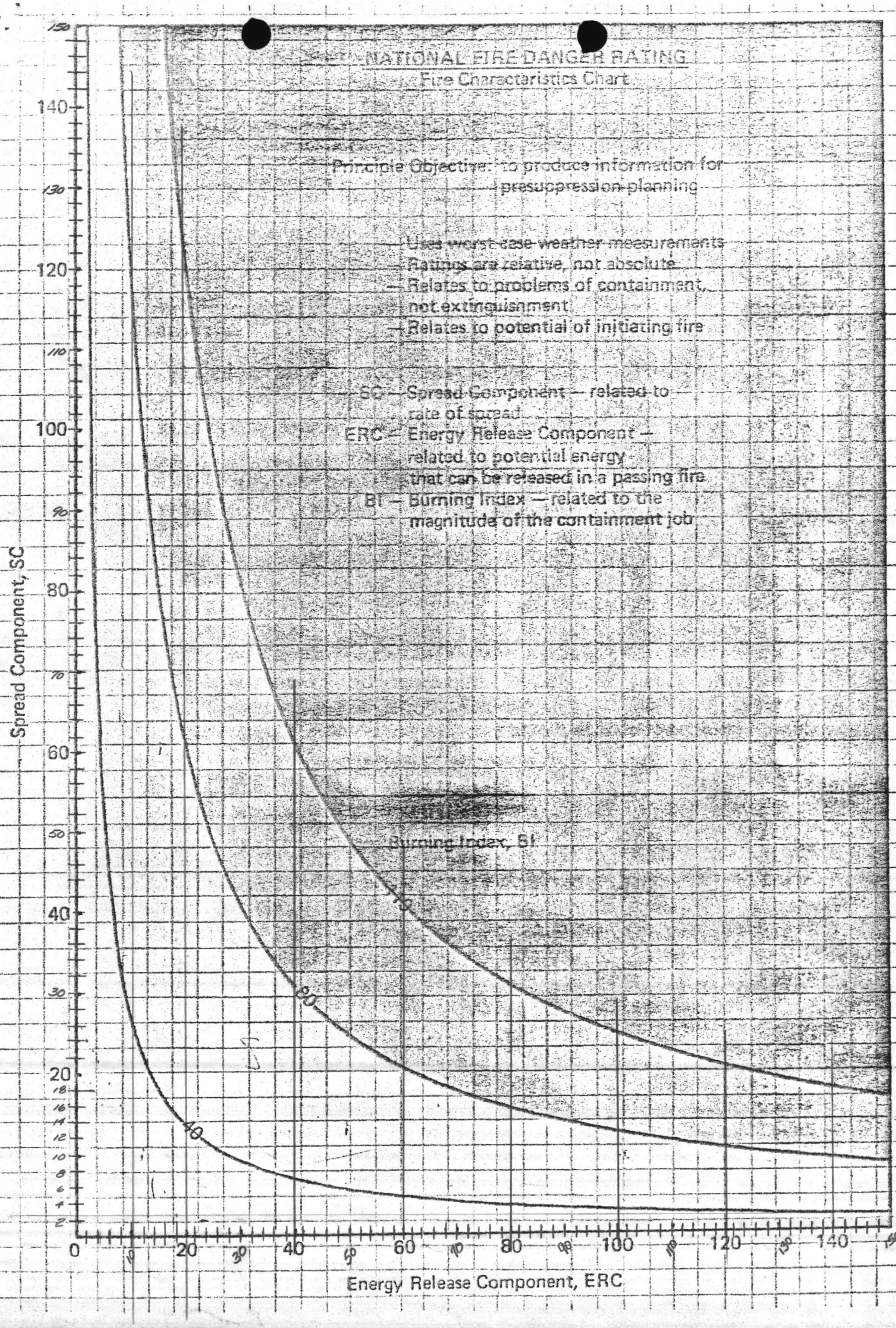
It is recommended that a teletype terminal be obtained through the Division of Forest Resources and be placed in operation on the eastern circuit for the purpose of obtaining up-to-date weather forecasts from the National Weather Service during fire season. It is also recommended that the spread component and energy release component of the National Fire Danger Rating System be utilized to compute class days. These elements measure the resistance of a fire to suppression actions and the measurement is in Burning Index.

We appreciate the opportunity to visit Camp LeJeune and look over the forest fire suppression organization. If we can be of assistance in the future, please call on us.

Sincerely,

Dane Roten
Senior Staff Forester
Fire Control

DR/dp


NATIONAL FIRE DANGER RATING
Fire Characteristics Chart
Principle Objective: to produce information for presuppression planning
— Uses worst case weather measurements
— Ratings are relative, not absolute
— Relates to problems of containment, not extinguishment
— Relates to potential of initiating fire
SC — Spread Component — related to rate of spread
ERC — Energy Release Component — related to potential energy that can be released in a passing fire
BI — Burning Index — related to the magnitude of the containment job
Burning Index, BI
40
80
110
Spread Component, SC
Energy Release Component, ERC
0
20
40
60
80
100
120
140

*33.11 - RESOURCE ADVISOR

The resource advisor (RA) works under direct supervision of the Forest Supervisor and advises the fire boss on resource values and possible environmental impacts of fire-suppression activities. He would normally be the District Ranger or Supervisory Forester from the District where the fire is burning, or a resource staff from the Forest headquarters.

The R.A. must be fully aware of all multiple use and functional plans relating to the area the fire is burning in, indicating potential effects of fire, beneficial, detrimental or negligible on these plans. He advises the fire boss on the type of control activities compatible with resource-management objectives. Prevention of soil damage, water damage, excessive visual impacts and relationship of fire cost, resource damage or enhancement from fire will be his primary areas of concern.

The resource advisor's duties are:

1. Provides fire overhead team with information on forest use, resource, and values.
2. Identifies for the fire boss, plans chief, and finance chief those areas where fire will enhance land productivity, where it will damage critical resources, and where fire effects will be negligible.
3. During strategy development integrates his knowledge of fire effects with plans and line, and helps seek the strategy to control the fire at least cost, with minimum damage and maximum benefits from fire.
4. Provides the fire boss with information on private land boundaries, properties, and values.
5. Advises the fire boss on environmental protection work needed in conjunction with control activities.

33.2 — Comptroller

The comptroller works under direct supervision of the Forest Supervisor, and in close correlation with the fire boss, finance chief, service chief, plans chief, and line boss on business and financial matters. He counsels with these men and makes sure that satisfactory business and financial management practices are being followed on all aspects of the fire.

The comptroller's duties are to:

1. Review business management activities for compliance with legal and fiscal requirements and for efficient use of resources.
2. Review the work of all fire positions having business management responsibilities for compliance with approved practices. Advises and assists supervisory personnel in corrective action required.
3. Attend planning sessions and provide legal and fiscal advice and to keep informed.
4. Advise finance and service chiefs on major business management problems within their functions.
5. Keep fire boss informed of general costs and suggest ways to eliminate waste, duplication, and unnecessary expenditures.
6. Provide advice on legality of proposed agreements, contracts, and unsual transactions involving the expenditure of funds, use of materials, equipment, and personnel.

HUBERT FIRE TOWER

LOTION 91

TRUE NORTH AZ FROM LOTION 91 TO ONSLOW BEACH WATER TOWER IS:

AZ IN MILS	3315.2
AZ IN DEGREES	186° 28′ 48″

SNEADS FERRY

LOTION 92

TRUE NORTH AZ FROM LOTION 92 TO ONSLOW BEACH

WATER TOWER IS

AZ IN MILS	1759.3
AZ IN DEGREES	98° 57′ 38.25″

COMBAT TOWN

LOTION ~~95~~ 93

TRUE NORTH AZ FROM LOTION 95 TO ONSLOW BEACH WATER TOWER IS

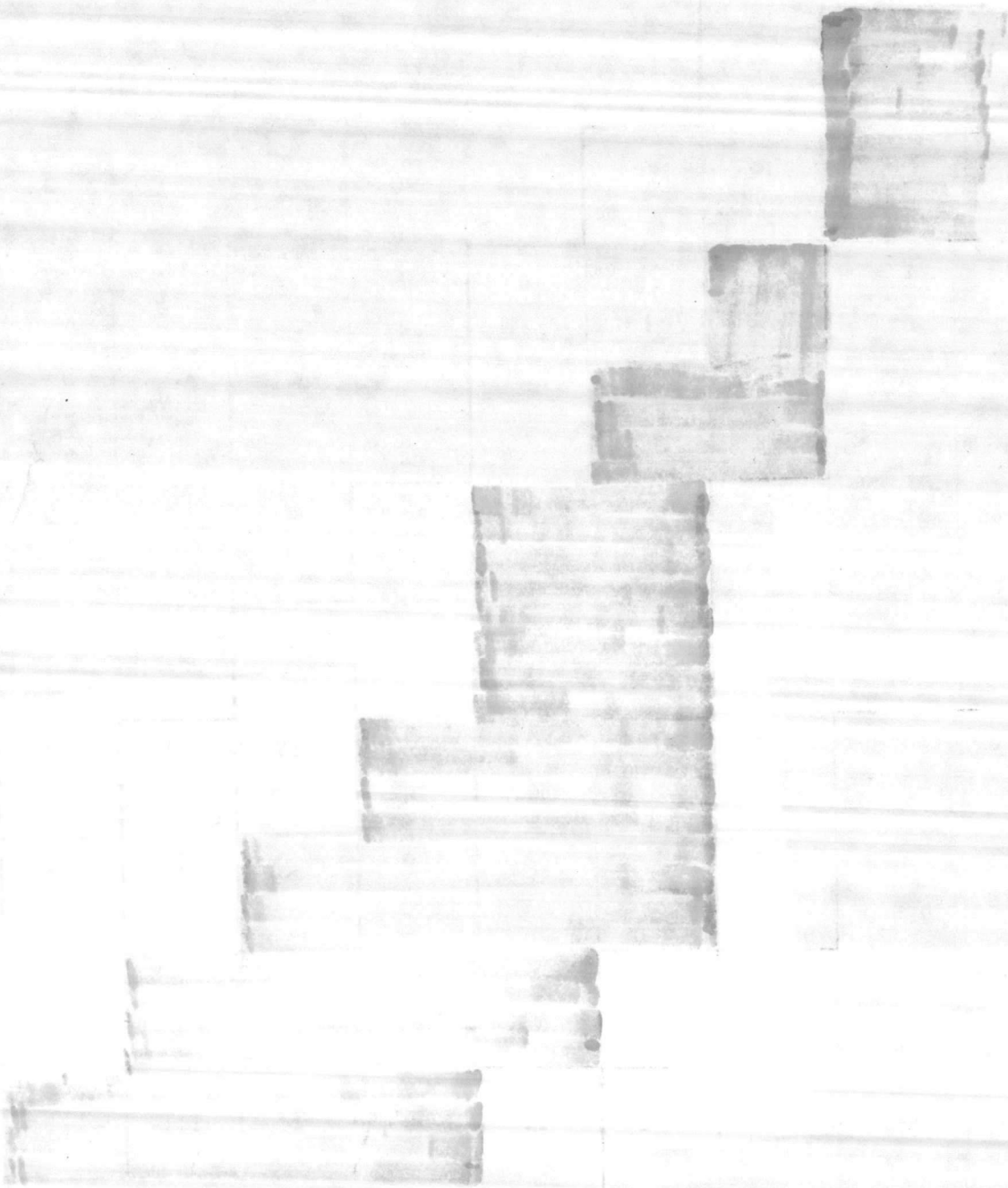
AZ IN MILS	2898.9
AZ IN DEGREES	163° 03' 47.25"

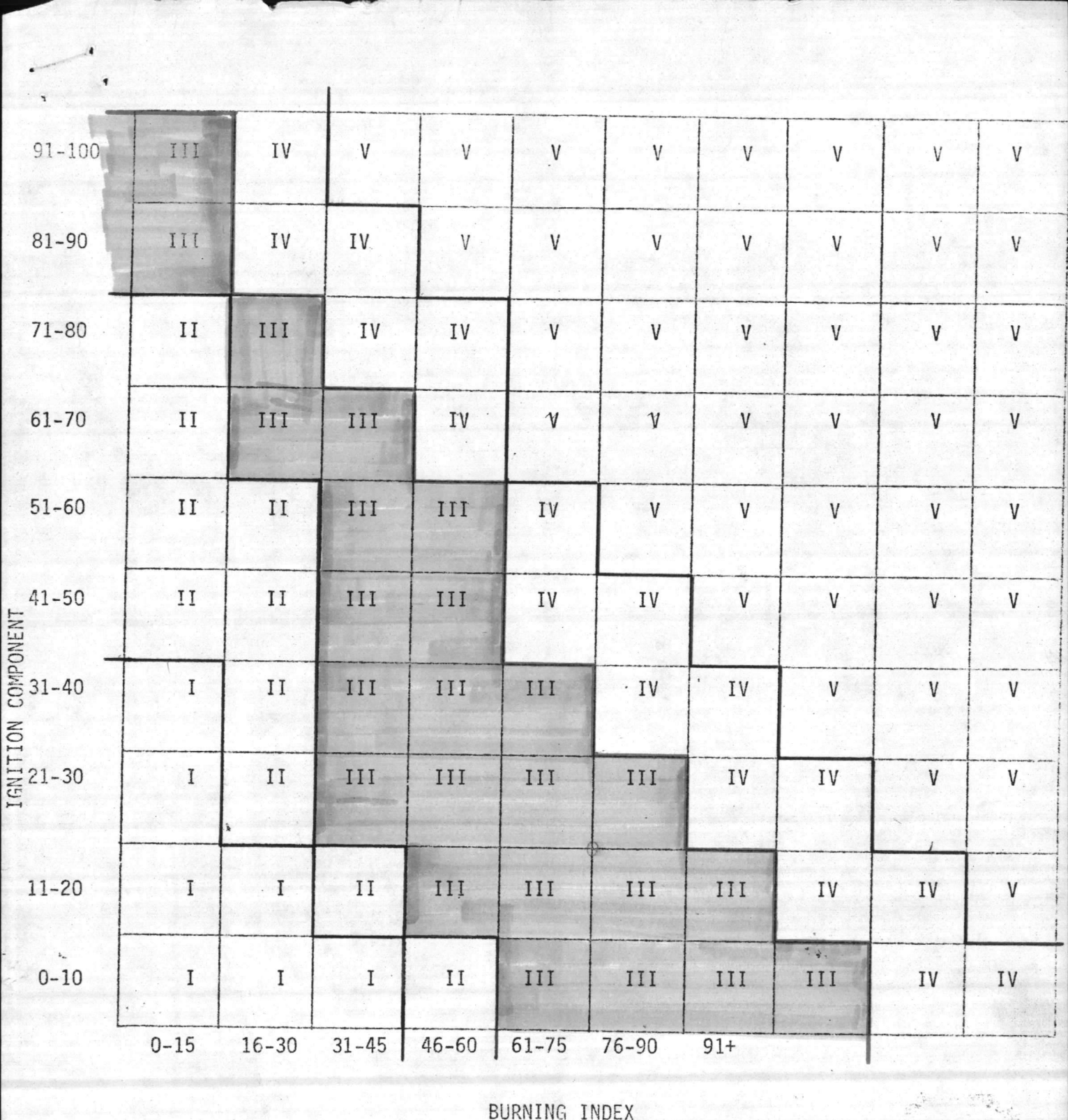
Grid North + 1° 21'

IGNITION COMPONENT	0-15	16-30	31-45	46-60	61-75	76-90	91+
91-100	III	IV	V	V	V	V	V
81-90	III	IV	IV	V	V	V	V
71-80	II	III	IV	IV	V	V	V
61-70	II	III	III	IV	V	V	V
51-60	II	II	III	III	IV	V	V
41-50	II	I	III	III	IV	IV	V
31-40	I						V
21-30	I						V
11-20	I						IV
0-10	I						IV

BURNING INDEX

File this under fire

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31-40 I II III III III IV IV V V V
21-30 I II III III III III IV IV V V
11-20 I I II III III III III IV IV V
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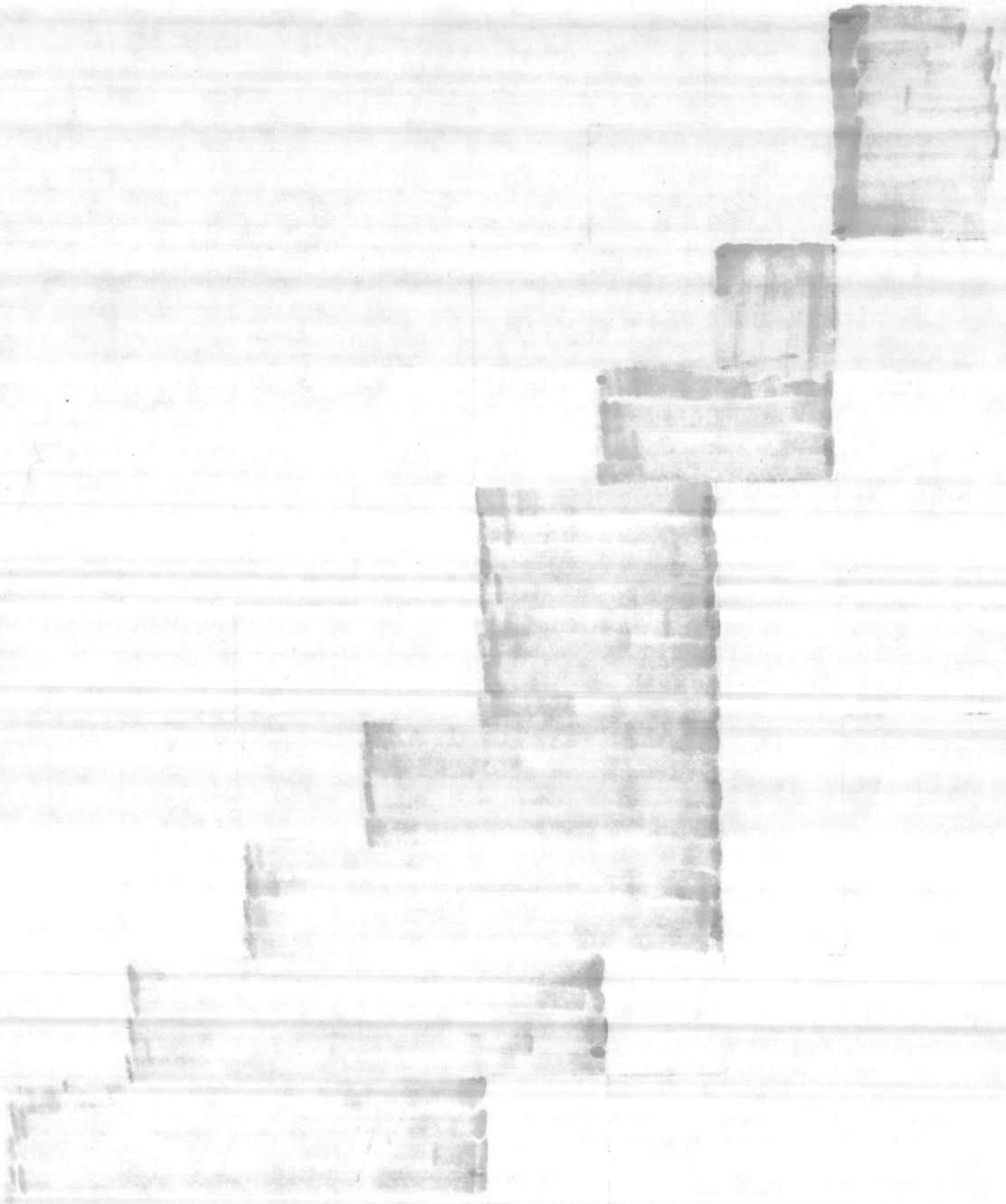
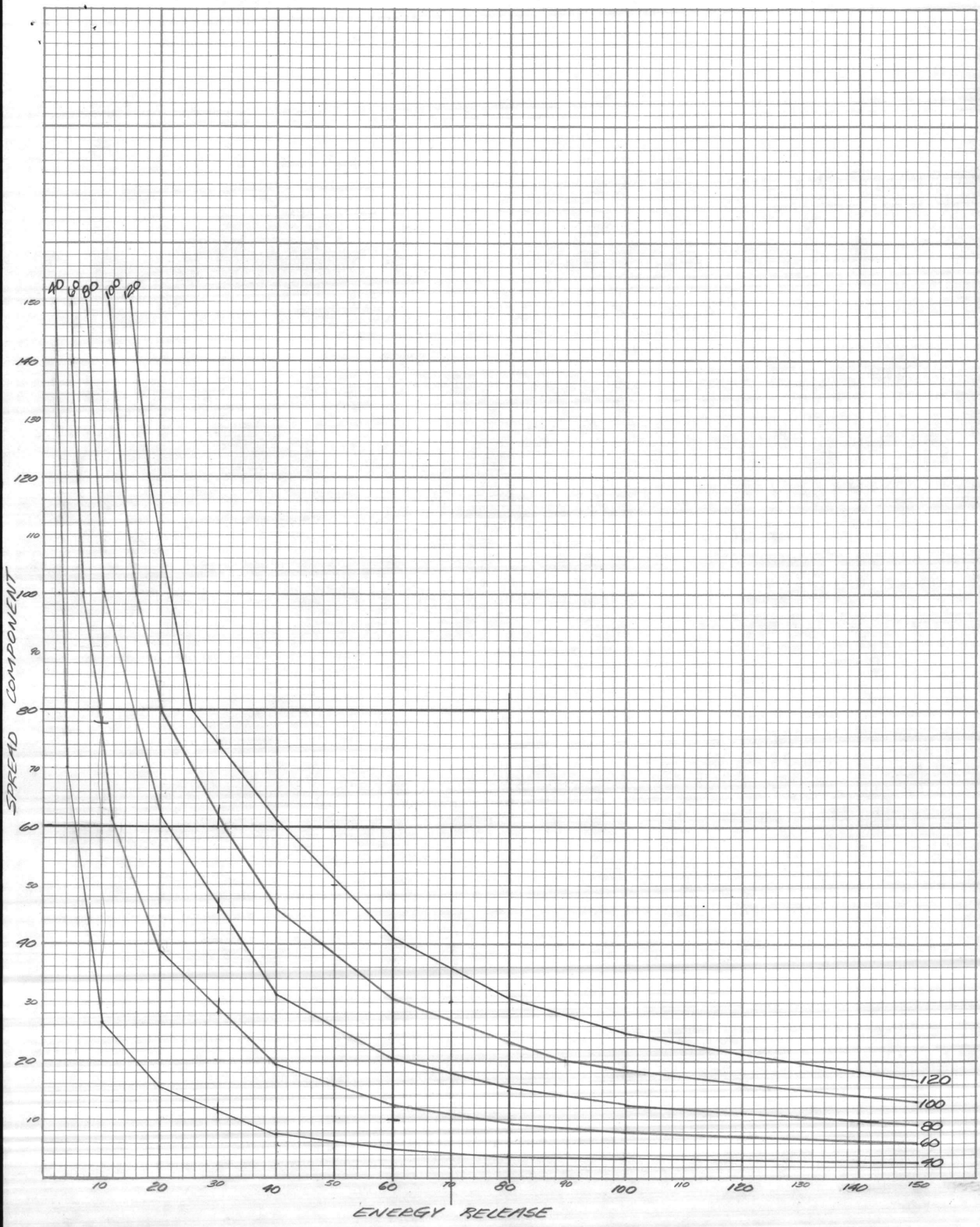
IGNITION COMPONENT
BURNING INDEX




40
60
80
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SPREAD COMPONENT
ENERGY RELEASE
10
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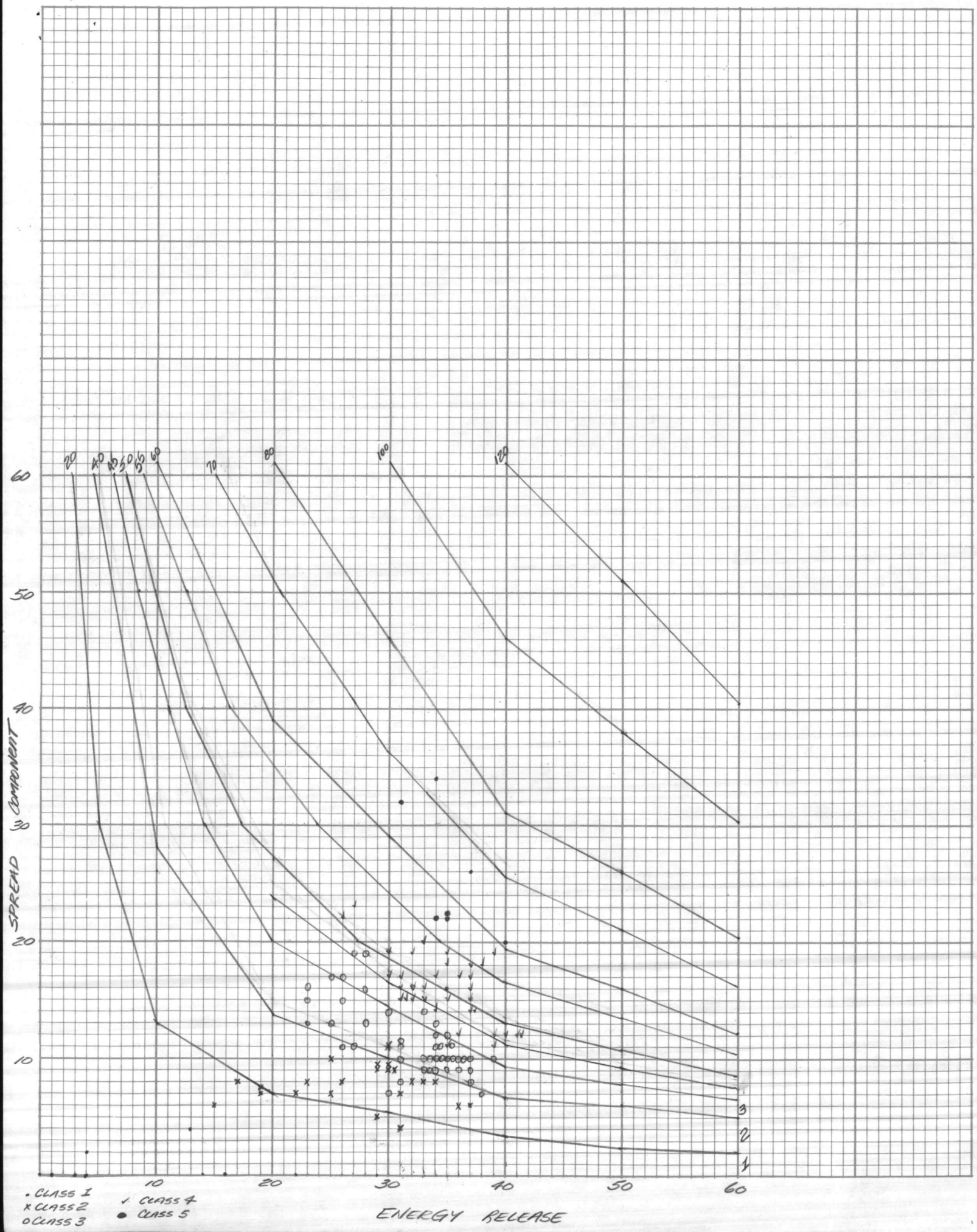
120
130
140
150


20
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120
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40
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20
10
SPREAD COMPONENT
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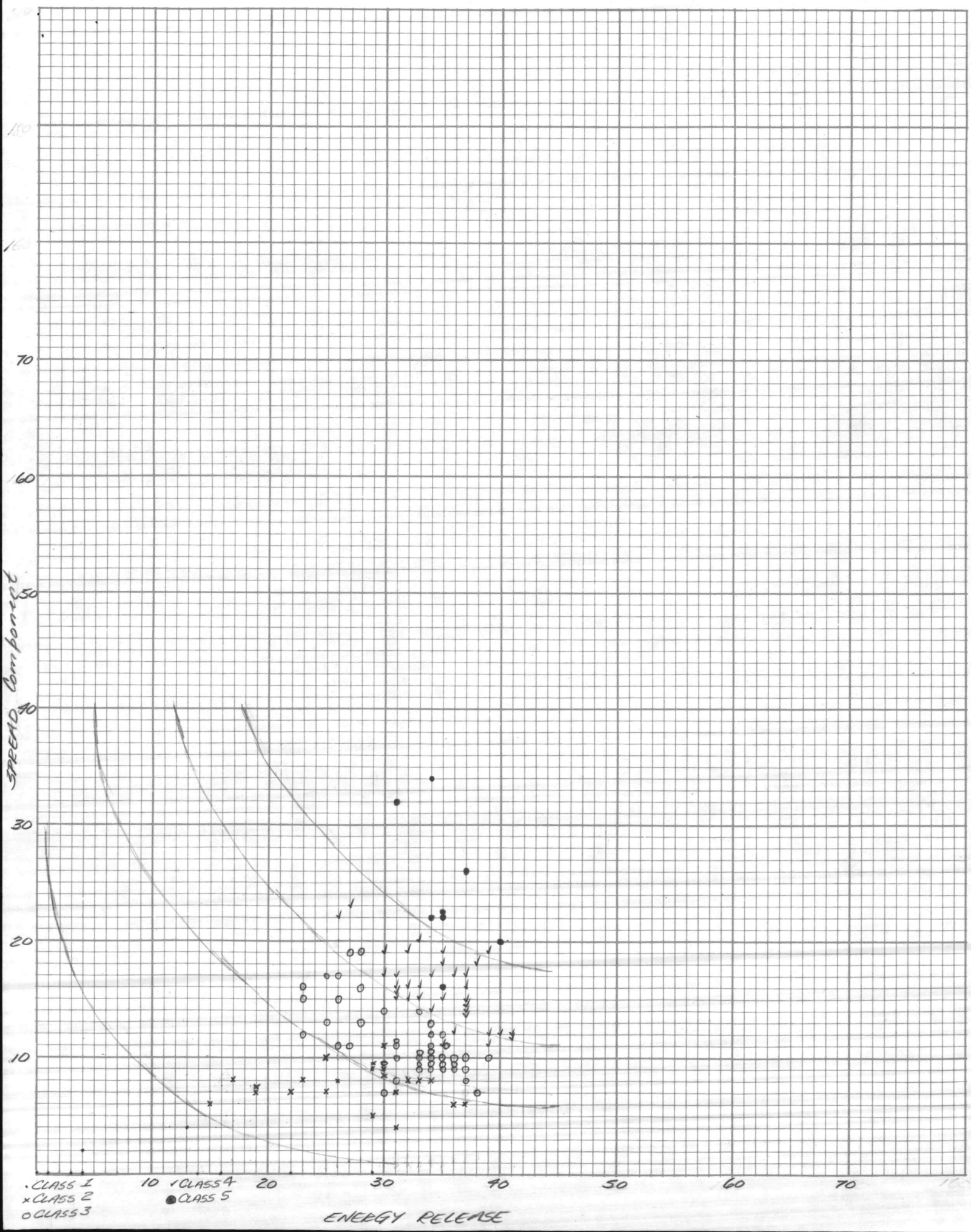
ENERGY RELEASE
3
2
1
• CLASS 1
× CLASS 2
○ CLASS 3
✓ CLASS 4
● CLASS 5


SPREAD Component
70
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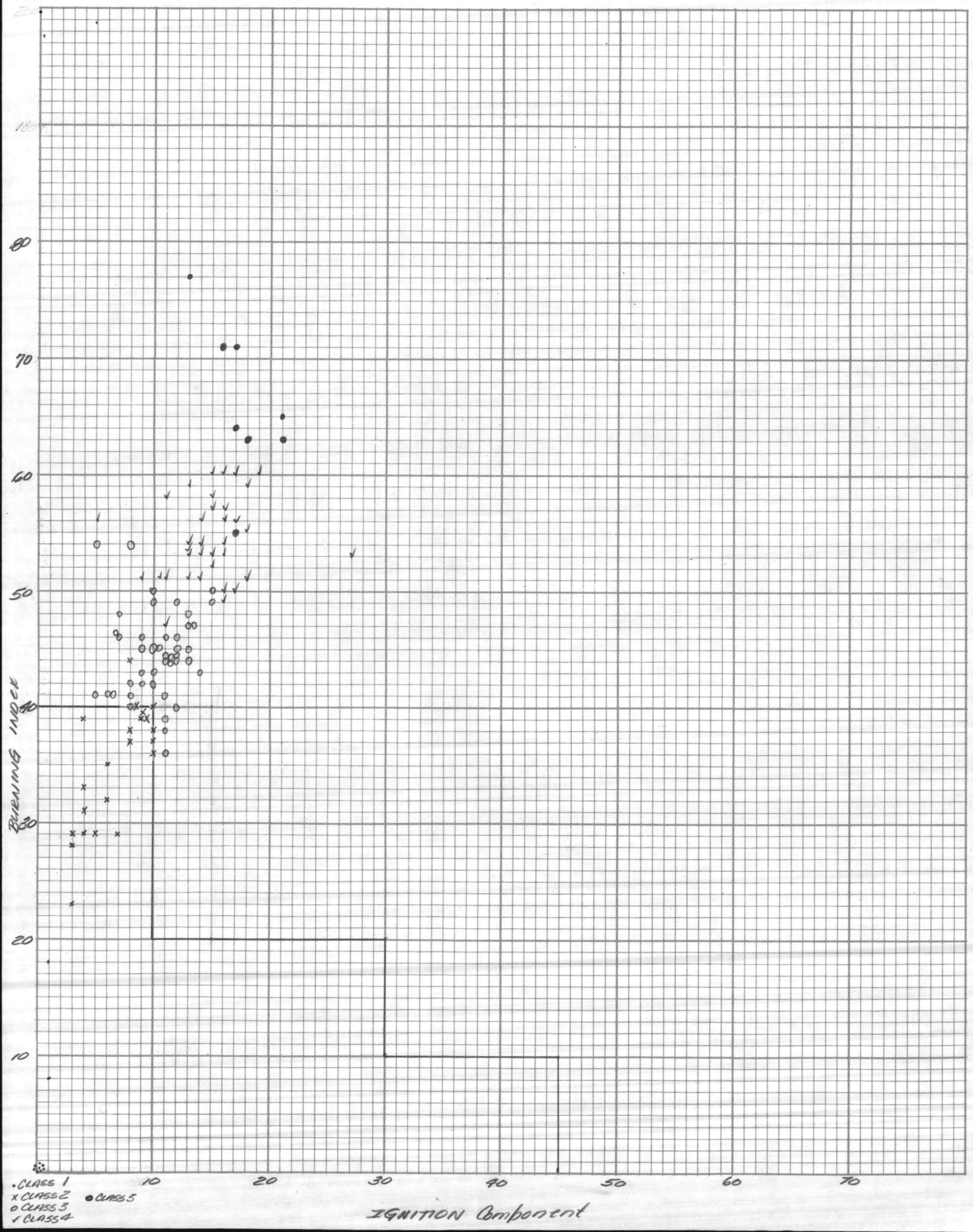
. CLASS 1
× CLASS 2
○ CLASS 3
✓ CLASS 4
● CLASS 5
ENERGY RELEASE


BURNING INDEX
IGNITION Component
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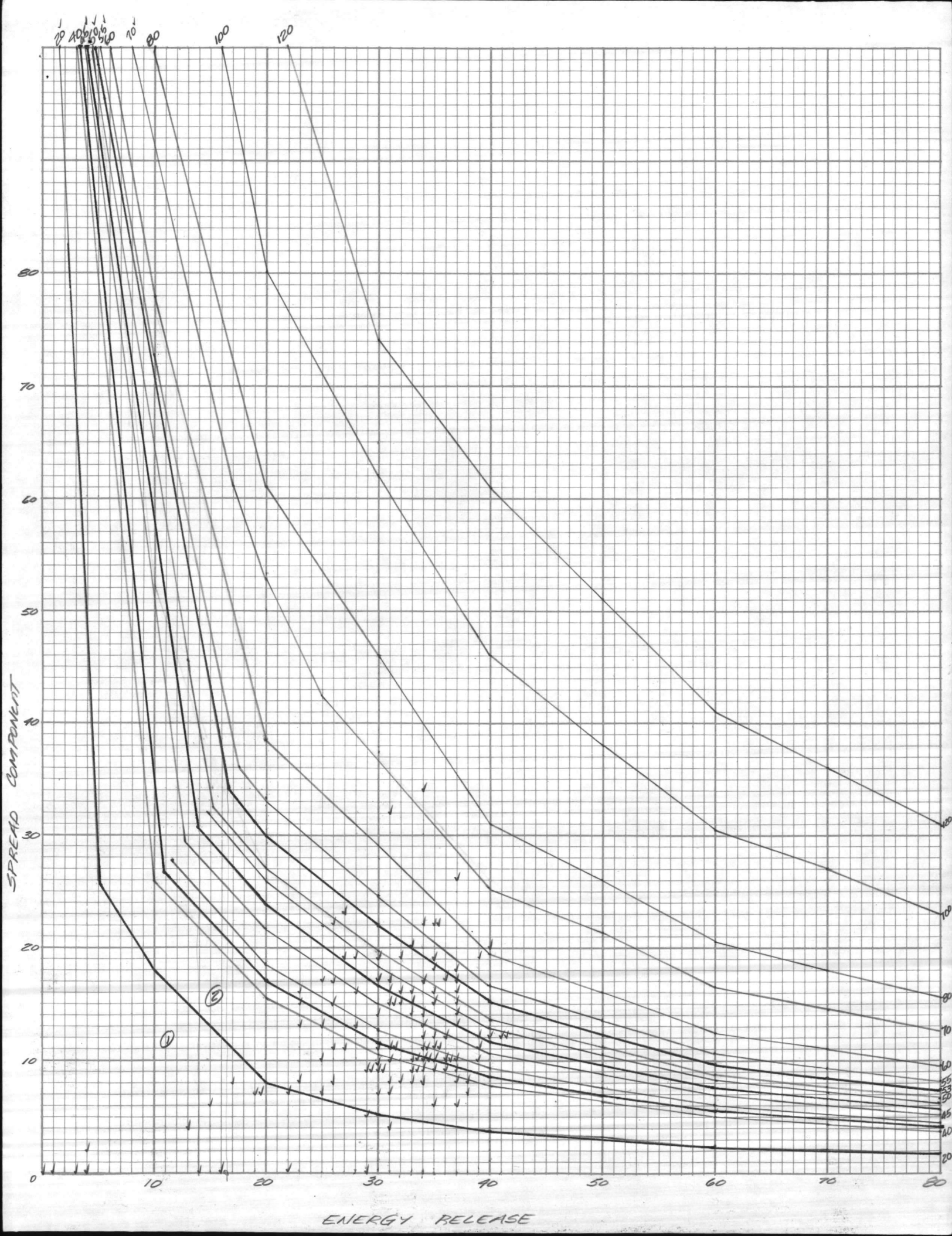
×CLASS 2
○CLASS 3
✓CLASS 4
●CLASS 5


SPREAD COMPONENT
ENERGY RELEASE
0
10
20
30
40
50
60
70
80
1
2

1985

1986

	MARCH	① BURNING INDEX	② IGNITION COMPONENT	③ CLASS DAY	④ ENERGY RELEASE	⑤ SPREAD COMPONENT	⑥	⑦	⑧ BURNING INDEX	⑨ IGNITION COMPONENT	⑩ CLASS DAY	⑪ ENERGY RELEASE	⑫ SPREAD COMPONENT	
1		0	0	1	14	0								1
2		32	6	2	23	8								2
3		38	11	3	31	8								3
4		42	9	3	25	13								4
5		49	10	3	26	17								5
6		49	15	3	35	12								6
7		44	12	3	33	10								7
8		48	13	3	30	14								8
9		35	6	2	26	8								9
10		50	15	3	33	14								10
11		0	0	1	29	0								11
12		58	11	4	27	23								12
13		43	14	3	37	9								13
14		41	11	3	34	9								14
15		55	18	4	37	15								15
16		51	9	4	32	15								16
17		0	0	1	0	0								17
18		53	16	4	30	17								18
19		49	16	4	36	12								19
20		54	16	4	33	16								20
21		46	7	3	23	16								21
22		0	0	1	3	0								22
23		29	4	2	17	8								23
24		45	9	3	23	15								24
25		23	3	2	15	6								25
26		36	11	3	30	7								26
27		56	16	4	30	19								27
28		52	15	4	31	16								28
29		40	10	2	30	9								29
30		44	12	3	31	11								30
31														31

INCONSISTANT

1985

1986

	April	1 Burning Index	2 Ignition Component	3 Class Day	4 Energy Release	5 Spread Component	6	7	8 Burning Index	9 Ignition Component	10 Class Day	11 Energy Release	12 Spread Component	
1		63	21	5	34	22								1
2		53	17	4	37	14								2
3		63	18	5	35	22								3
4		55	17	5	35	16								4
5		60	17	4	33	20								5
6		71	16	5	31	32								6
7		59	18	4	37	17								7
8		60	19	4	38	18								8
9		65	21	5	40	20								9
10		50	17	4	41	12								10
11		56	17	4	37	16								11
12		47	11	4	35	11								12
13		48	7	3	25	17								13
14		8	1	1	4	2								14
15		28	3	2	19	7								15
16		38	8	2	29	9								16
17		57	16	4	32	19								17
18		50	16	4	39	11								18
19		46	12	3	34	11								19
20		44	13	3	36	9								20
21		40	12	3	37	8								21
22		45	13	3	37	10								22
23		51	18	4	39	12								23
24		54	14	4	37	14								24
25		45	12	3	36	10								25
26		48	14	3	39	10								26
27		60	16	4	35	19								27
28		53	14	4	35	15								28
29		56	14	4	34	17								29
30		44	11	3	34	10								30
31														31

		1985							1986					
		①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	
	MAY	BURNING INDEX	IGNITION COMPONENT	CLASS DAY	ENERGY RELEASE	SPREAD COMPONENT			BURNING INDEX	IGNITION COMPONENT	CLASS DAY	ENERGY RELEASE	SPREAD COMPONENT	
1		50	10	3	28	16								1
2		64	17	5	35	22								2
3		0	0	1	4	0								3
4		53	13	4	32	16								4
5		37	10	2	37	6								5
6		57	15	4	36	17								6
7		44	11	3	35	10								7
8		41	6	3	26	11								8
9		0	0	1	22	0								9
10		41	5	3	23	13								10
11		29	3	2	19	7								11
12	MISSING →	18	1	1	13	4								12
13		29	7	2	31	4								13
14		39	9	2	29	9								14
15		37	8	2	31	7								15
16														16
17		44	8	2	30	11								17
18		47	13	3	35	11								18
19		36	10	2	36	6								19
20		54	8	3	27	19								20
21		0	0	1	16	0								21
22		40	8	3	30	9								22
23		46	7	3	26	15								23
24		51	11	4	31	15								24
25		41	8	3	27	11								25
26		53	13	4	33	15								26
27		44	11	3	35	10								27
28		43	10	3	34	10								28
29		45	10	3	31	11								29
30		31	4	2	22	7								30
31		54	13	4	31	17								31

1985 1986

	JUNE	① BURNING INDEX	② IGNITION COMPONENT	③ CLASS DAY	④ ENERGY RELEASE	⑤ SPREAD COMPONENT	⑥	⑦	⑧ BURNING INDEX	⑨ IGNITION COMPONENT	⑩ CLASS DAY	⑪ ENERGY RELEASE	⑫ SPREAD COMPONENT	
1		38	10	2	33	8								1
2		42	10	3	33	9								2
3		39	9	2	34	8								3
4		51	14	4	34	14								4
5		51	11	4	31	15								5
6		46	9	3	28	13								6
7		33	4	2	25	7								7
8		40	8	2	30	9								8
9		47	13	3	34	12								9
10		59	13	4	37	18								10
11		71	17	5	37	26								11
12		77	13	5	34	34								12
13		53	15	4	41	12								13
14		51	13	4	40	12								14
15		41	6	3	33	9								15
16		54	5	3	28	19								16
17		60	15	4	39	19								17
18		56	5	4	26	22								18
19		39	4	2	25	10								19
20		42	8	3	35	9								20
21		39	11	3	38	7								21
22		58	15	4	35	18								22
23		45	10	3	34	11								23
24		49	12	3	34	13								24
25		43	9	3	31	10								25
26		44	11	3	33	10								26
27		46	12	3	36	10								27
28		39	9	2	32	8								28
29		29	5	2	29	5								29
30		0	0	1	1	0								30
31														31

CAMP LEJEUNE SPECIAL MAP

NOTE A

Navigation regulations are published in Chapter 2 U.S. Coast Pilot 4, or weekly Notice to Mariners which include new or revised regulations. Information concerning the regulations may be obtained at the Office of the District Engineer, Corps of Engineers in Wilmington, N.C.

Anchorage regulations may be obtained at the Office of the Commander 5th Coast Guard District in Portsmouth, Va.

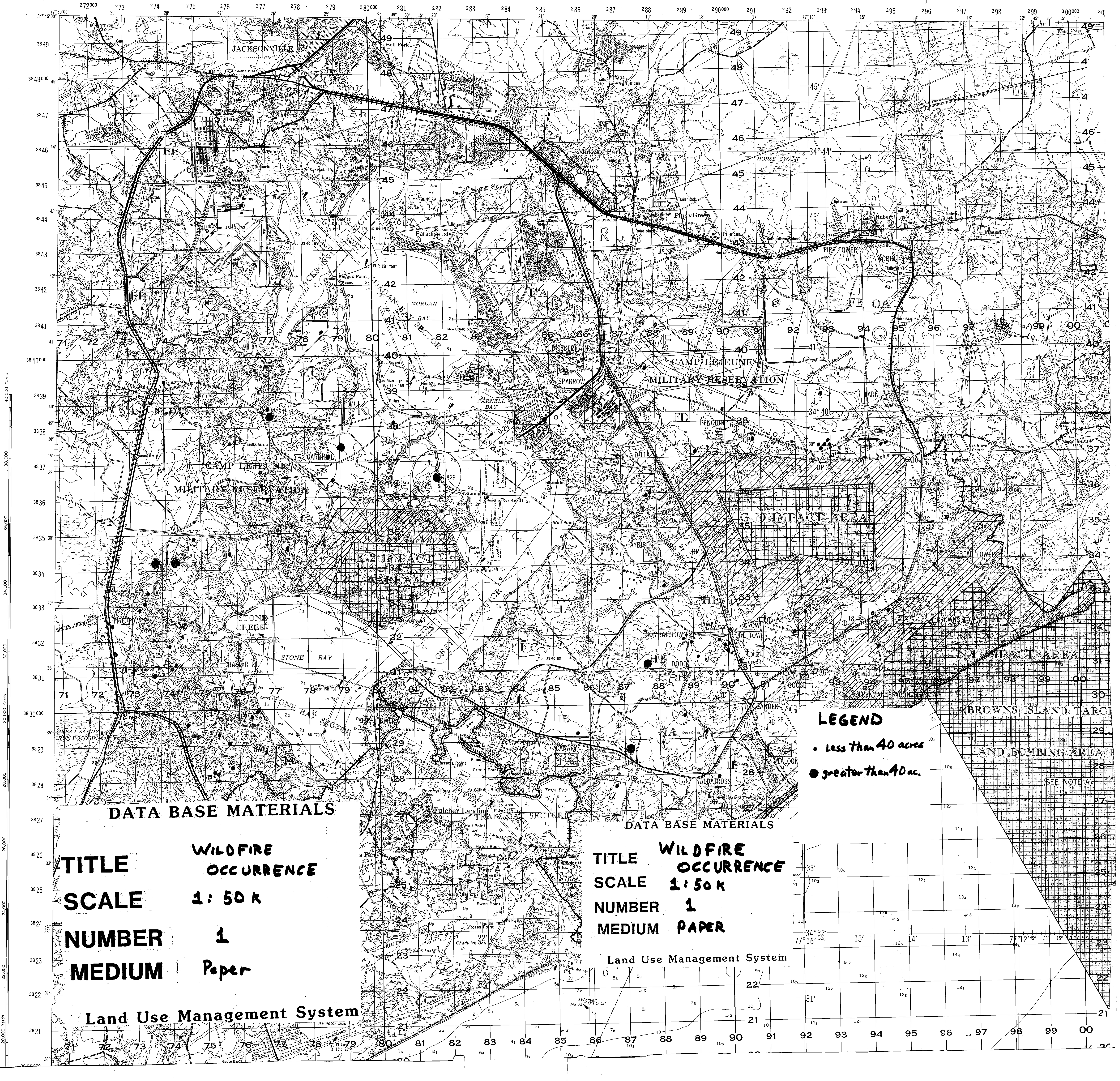
CAUTION

Numerous fish traps, duck blinds and stakes have been reported in the area of this chart; some may be submerged. Small craft should use caution when operating outside the main channel.

Temporary defects in aids to navigation are not indicated on charts, except where a buoy replaces a fixed aid. See Notice to Mariners.

The controlling depth at mean low water from the Intracoastal Waterway to Jacksonville, N.C. was 9 feet for a middle width of 45 feet on May 1971.

SOUNDINGS IN METERS



DATA BASE MATERIALS

TITLE WILDFIRE OCCURRENCE

SCALE 1:50 K

NUMBER 1

MEDIUM Paper

Land Use Management System

DATA BASE MATERIALS

TITLE WILDFIRE OCCURRENCE

SCALE 1:50 K

NUMBER 1

MEDIUM PAPER

Land Use Management System

Yr. 85
CAL. FIRE LOCATIONS

CAMP LEJEUNE SPECIAL MAP

NOTE A

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Anchorage regulations may be obtained at the Office of the Commander 5th Coast Guard District in Portsmouth, Va.

SOUNDINGS IN METERS

1 1/2 0 Statute Miles 1 2 3 4 5

1 1/2 0 Nautical Miles 1 2 3 4 5

1000 0 Meters 2000 4000 6000 8000

80 FIRE 1906 - AC.

CAUTION

Numerous fish traps, duck blinds and stakes have been reported in the area of this chart; some may be submerged. Small craft should use caution when operating outside the main channel.

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DATA BASE MATERIALS

TITLE WILDFIRE OCCURRENCE

SCALE 1:50K

NUMBER 1

MEDIUM Paper

Land Use Management System

Yr. 85
CAL. FIRE LOCATIONS

TAB PLACEMENT HERE

DESCRIPTION:

Blow-up Alert

Sea Breezes

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50M (11-7[illegible])

N. C. [illegible]ARTMENT OF NATURAL AND ECONO[illegible] RESOURCES

N. C. FOREST SERVICE

MEMORANDUM

To Ken Harrison - Camp LeJeune

From Bill Hanner

Subject Info on Blow-up Fires

Date 9/16/76

Ken -

Reference our telecom this morning - Hope the attached data will assist you in your efforts.

Bill Hanner

Blow-up Alert Readiness Plan

The purpose of the "blow-up alert" is to maximize prevention activities and initial attack capability. Prevention activities should be maximized to prevent all fires possible. Initial attacks should be made as soon as possible with sufficient force to control all fires before the critical "blow-up" size is reached.

Each district will develop an appropriate "blow-up alert" plan. The required readiness will be equal to or greater than the readiness requirements on Readiness Plan 7. When a "blow-up alert" is in effect, the Regional Headquarters will operate on Readiness Plan 7 until the "blow-up alert" is cancelled.

This was taken from the 1976 Region I, NCFS Operations & Mobilization Plan

"Blow-up" Conditions

"Blow-up" conditions are severe fire weather conditions not fully indicated by normal fire danger measurements. Three elements must be present for "blow-up" conditions to exist. These elements are:

1. Adverse wind profile
2. Unstable atmospheric conditions
3. Considerable deep drying of fuel beds and heavy fuels, and dry fine fuels. This is indicated by the build-up index and fine fuel moisture. (BUI near 25 or over and fine fuel moisture 6.5% or less).

Procedure for Determining and Verification of "Blow-up" Conditions

1. Weather Service

   The Weather Service Fire Weather Forecaster will monitor wind profile soundings at Greensboro and Hatteras and determine atmospheric stability conditions daily. Stability conditions, along with the Schowalter Stability Index will be given with the daily fire weather forecast. The Weather Service will also notify all field offices when an adverse wind profile is detected at either Greensboro or Hatteras.

2. Regional Operations Officer

   When a report of an adverse profile is received, the Regional Operations Officer will initiate the taking of pibal readings at the Regional Headquarters and request readings from Cherry Point Marine Air Station and the Dare Bomb Range. The readings from each location will be plotted and the profile type determined. Pibal readings and profile type will be relayed by teletype to the Central Office and Weather Service for information and concurrence. If the wind profile measurement at either Kinston, Cherry Point or Dare Bomb Range is determined to be adverse, when unstable atmospheric conditions exist, the Regional Operations Officer will notify all R-I field offices by teletype that possible "blow-up" conditions exist.

3. District Operations Officer

When possible "blow-up" conditions are reported, the Operations Officer will determine if the fuels are sufficiently dry for "blow-up" fires to occur (build-up index near 25 or over and fine fuel moisture 6.5% or less). If all elements necessary for "blow-up" conditions are present, the District Operations Officer(s) will initiate a "blow-up" alert. The "blow-up" alert will be activated by transmitting over the NCFS radio "blow-up conditions exist." When a "blow-up alert" is activated, the district readiness plan will be reported to the Central Office as RP-7. The "blow-up" alert will remain in effect one full day after the wind profile has returned to normal or the atmosphere has become stable; or there is a marked increase in fuel moisture conditions.

1.1541 - Types of Wildfires. A discussion of fire danger ratings as indicators of impending burning potential would be incomplete if no reference to types of wildfires were included. A fire's type depends upon certain characteristics of its behavior. For convenience simple descriptive terms will be used to designate each of the two commonly recognized types of free running or wildfires: 2-D (two dimensional - surface fires) and 3-D (three dimensional - convection column or blow-up fires).

The designations 2-D and 3-D are somewhat misleading. Every wildfire, of course, has three dimensions - length, breadth and height (or depth). However, a 2-D fire is a relatively flat or thin fire. It is dominated by the energy of the wind field and will form a smoke plume rather than a dynamic convection column. Having considerable length and width but little height the process involved with combustion and dissipation of energy take place near the ground. Smoke from a 2-D fire usually rises lazily and is carried off in the direction the surface wind is blowing and flame heights seldom exceed 40 to 50 feet. Nethertheless, the force of a high wind will give some of these fires high rates of spread and make them difficult to control but they do not have the erratic and violent behavior characteristics or extreme rates of spread of the 3-D fires.

A 3-D fire has length and width, but its height may exceed either of these surface dimensions, or the two in combination. A turbulent convection column may tower 25 thousand feet or more and flames may be seen several hundred feet above the ground. Here the energy-conversion rate in the convection column exceeds the rate of flow of kinetic energy in the wind field so that the fire-wind system is dominated by the energy of the fire and has vertical or 3-D structure.

Wind speed normally increases with height up to several thousand feet above the surface. On approximately 2-5%

of the days during fire season the opposite condition exists. Although the wind speed immediately above the surface may increase with height there is a zone of decreasing wind speed above a low-level jet point 1500 feet or less above the surface. It is this "adverse wind profile" or decrease of wind speed with height which permits a fire to build its "chimney" or convection column.

When conditions favor 3-D burning, it is not unusual for a fire to exhibit 2-D and 3-D characteristics alternately. A surface fire may suddenly turn into a 3-D fire only to resume 2-D behavior within a few minutes. Only on rare occasions does a fire remain 3-D for more than several hours on end.

It is extremely important that conditions favoring 3-D burning be recognized and the significance of these conditions be fully appreciated. A 3-D fire can present serious threats to the lives of fire-fighters, forest users and local residents. These fires do tremendous damage to a wide variety of resources. Conventional suppression methods are ineffective in controlling such a fire.

On ground burning country, fires burning organic soils frequently are referred to as "ground fires". This does not identify them with respect to behavior characteristics. These fires ordinarily burn surface fuels along with sub-surface material and they also can assume 3-D proportions.

While all factors contributing to 3-D fire behavior certainly are fire danger factors, many of them are not taken into account when making a fire danger rating. This does not mean that fire danger ratings have no value as indicators of 3-D burning potential. Fire danger ratings and the information upon which they are based are good indicators of the severity of burning conditions at or near ground level. Only when

Surface fires can burn with high intensity is the danger of a blow-up.

Fires seem most likely to blow-up when the following conditions exist:

(1) Fuels are dry & plentiful
(2) The atmosphere is either unstable or was unstable for some hours, and possibly days, prior to the fire.
(3) The wind speed of the free air is 12 mph or more at an elevation equal to, or not much above the elevation of the fire.
(4) The wind decreases with height several thousand feet above the fire with the possible exception of the first few hundred feet

Knowing both the surface burning conditions and the conditions of the atmosphere a fire manager is in a position to determine the likelihood of a 3-D fire occuring.

Reliable fire danger ratings, as well as the other local weather data and information supplied by the National Weather Service should be examined whenever blow-up conditions are suspected. When properly used this can warn of the possibility of 3-D burning activity.

Comments & Observations on the Phenomenon of a Blow-up Fire

Blow-up implies a rapid, often sudden, increase in intensity from a relatively low to a much higher level - This is a cyclic process.

Low fuel moisture means high combustion rates and thusly short combustion periods.

A decrease in fuel moisture means an increase in available fuel and hence fuel energy. — BTU promote an increase in fire intensity

Growing fire intensity in turn lengthens the critical burn-out time. This means an increase in fuel energy available for convection. This tends to establish a cyclic reinforcement which favors the growth of fire intensity.

As intensity grows both available fuel energy and the fuel energy available for convection increases still further (ie - crowning).

The atmospheric factors become increasingly more significant as the fuel energy available for convection continues to increase.

Eventually the point is reached when Pf (rate at which thermal energy is converted to kinetic energy at any height (z) above the fire) begins to exceed Pw (rate of flow of kinetic energy in the wind field at some height (z) above the fire) in the lower levels. Convection can now begin on a large scale if Pw decreases with height above the surface. This means the fire can build its convection column or chimney very quickly, and the most rapid part of the blow-up is underway.

Now spotting and ignition probability become dominant fire behavior factors. Whirlwinds and strong updrafts can produce ember showers over large areas of unburned

fuels. Turbulent rolls on the leading edge of the flame front may bring flame sheets in direct contact with fresh fuel.

After the rate of build-up has leveled off at a high intensity there will be a well developed convection column over the fire. The shape of a convection column is determined by the winds aloft. If there is a low-level jet wind, with a fairly deep zone of decreasing wind speed, the convection column will tend to curve upward slightly throughout the zone. If the speed of the winds above this zone is sufficiently low so that $P_f > P_w$ for an indefinite height, then the convection column will tower to a great height and form a white water-vapor cap. If above the zone of decreasing wind speed, there is a rapid increase in wind speed, so that at the higher levels $P_f < P_w$ the convection column will fracture, lose its updraft velocity, and tend to drift horizontally.

The direction in which spot fires are likely to occur can be anticipated by observing the direction in which the upper part of the column tends to lean and also the direction of smoke drift aloft if the column fractures. Spotting can occur on a large scale with type of column but seems to be worse with the latter.

The tendency of a fire to blow-up, or start to build a convection column, is more closely related to rate of total energy output than size of fire. It also depends on the wind profile and speed of the surface wind. If there is a low-level jet wind, the build-up of intensity will start very rapidly if the wind-speed maximum is at or near the surface!

Blow-up Alert Readiness Plan

The purpose of the "blow-up alert" is to maximize prevention activities and initial attack capability. Prevention activities should be maximized to prevent all fires possible. Initial attacks should be made as soon as possible with sufficient force to control all fires before the critical "blow-up" size is reached.

INITIAL ATTACK

Each district will develop an appropriate "blow-up alert" plan. The required readiness will be equal to or greater than the readiness requirements on Readiness Plan 7. When a "blow-up alert" is in effect, the Regional Headquarters will operate on Readiness Plan 7 until the "blow-up alert" is cancelled.

This was taken from the 1976 Region I, NCFS Operations & Mobilization Plan

"Blow-up" Conditions

"Blow-up" conditions are severe fire weather conditions not fully indicated by normal fire danger measurements. Three elements must be present for "blow-up" conditions to exist. These elements are:

3 ELEMENTS REQUIRED

BUILD up 25+
RELATIVE HUMIDITY <30%
FINE FUEL MOISTURE < 6.5%

1. Adverse wind profile
2. Unstable atmospheric conditions
3. Considerable deep drying of fuel beds and heavy fuels, and dry fine fuels. This is indicated by the build-up index and fine fuel moisture. (BUI near 25 or over and fine fuel moisture 6.5% or less).

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When a report of an adverse profile is received, the Regional Operations Officer will initiate the taking of pibal readings at the Regional Headquarters and request readings from Cherry Point Marine Air Station and the Dare Bomb Range. The readings from each location will be plotted and the profile type determined. Pibal readings and profile type will be relayed by teletype to the Central Office and Weather Service for information and concurrence. If the wind profile measurement at either Kinston, Cherry Point or Dare Bomb Range is determined to be adverse, when unstable atmospheric conditions exist, the Regional Operations Officer will notify all R-I field offices by teletype that possible "blow-up" conditions exist.

3. District Operations Officer

When possible "blow-up" conditions are reported, the Operations Officer will determine if the fuels are sufficiently dry for "blow-up" fires to occur (build-up index near 25 or over and fine fuel moisture 6.5% or less). If all elements necessary for "blow-up" conditions are present, the District Operations Officer(s) will initiate a "blow-up" alert. The "blow-up" alert will be activated by transmitting over the NCFS radio "blow-up conditions exist." When a "blow-up alert" is activated, the district readiness plan will be reported to the Central Office as RP-7. The "blow-up" alert will remain in effect one full day after the wind profile has returned to normal or the atmosphere has become stable; or there is a marked increase in fuel moisture conditions.

LENGTH OF "BLOW-UP" ALERT

1.1541 - Types of Wildfires: A discussion of fire danger ratings as indicators of impending burning potential would be incomplete if no reference to types of wildfires were included. A fire's type depends upon certain characteristics of its behavior. For convenience simple descriptive terms will be used to designate each of the two commonly recognized types of free running or wildfires: 2-D (two dimensional - surface fires) and 3-D (three dimensional - convection column or blow-up fires).

The designations 2-D and 3-D are somewhat misleading. Every wildfire, of course, has three dimensions - length, breadth and height (or depth). However, a 2-D fire is a relatively flat or thin fire. It is dominated by the energy of the wind field and will form a smoke plume rather than a dynamic convection column. Having considerable length and width but little height the process involved with combustion and dissipation of energy take place near the ground. Smoke from a 2-D fire usually rises lazily and is carried off in the direction the surface wind is blowing and flame heights seldom exceed 40 to 50 feet. Nevertheless, the force of a high wind will give some of these fires high rates of spread and make them difficult to control but they do not have the erratic and violent behavior characteristics or extreme rates of spread of the 3-D fires.

A 3-D fire has length and width, but its height may exceed either of these surface dimensions, or the two in combination. A turbulent convection column may tower 25 thousand feet or more and flames may be seen several hundred feet above the ground. Here the energy-conversion rate in the convection column exceeds the rate of flow of kinetic energy in the wind field so that the fire-wind system is dominated by the energy of the fire and has vertical or 3-D structure.

Wind speed normally increases with height up to several thousand feet above the surface. On approximately 2-5%

0 the days during fire season the opposite condition exists. Although the wind speed immediately above the surface may increase with height, there is a zone of decreasing wind speed above a low-level jet point 1500 feet or less above the surface. It is this "adverse wind profile" or decrease of wind speed with height which permits a fire to build its "chimney" or convection column.

When conditions favor 3-D burning, it is not unusual for a fire to exhibit 2-D and 3-D characteristics alternately. A surface fire may suddenly turn into a 3-D fire only to resume 2-D behavior within a few minutes. Only on rare occasions does a fire remain 3-D for more than several hours on end.

It is extremely important that conditions favoring 3-D burning be recognized and the significance of these conditions be fully appreciated. A 3-D fire can present serious threats to the lives of fire-fighters, forest users and local residents. These fires do tremendous damage to a wide variety of resources. Conventional suppression methods are ineffective in controling such a fire.

On ground burning country, fires burning organic soils frequently are referred to as "ground fires". This does not identify them with respect to behavior characteristics. These fires ordinarily burn surface fuels along with sub-surface material and they also can assume 3-D proportions.

While all factors contributing to 3-D fire behavior certainly are fire danger factors, many of them are not taken into account when making a fire danger rating. This does not mean that fire danger ratings have no value as indicators of 3-D burning potential. Fire danger ratings and the information upon which they are based are good indicators of the severity of burning conditions at or near ground level. Only when

Surface fires can burn with high intensity is the danger of a blow-up.

Fires seem most likely to blow-up when the following condition's exist;

(1) Fuels are dry & plentiful.
(2) The atmosphere is either unstable or was unstable for some hours, and possibly days, prior to the fire.
(3) The wind speed of the free air is 12 mph or more at an elevation equal to, or not much above the elevation of the fire.
(4) The wind decreases with height several thousand feet above the fire with the posible exception of the first few hundred feet

Knowing both the surface burning conditions and the conditions of the atmosphere a fire manager is in a position to determine the likelihood of a 3-D fire occuring.

Reliable fire danger ratings, as well as the other local weather data and information supplied by the National Weather Service should be examined whenever blow-up conditions are suspected. When properly used this can warn of the possibility of 3-D burning activity.

Comments & Observations on the Phenomenon of a Blow-up Fire

Blow-up implies a rapid, often sudden, increase in intensity from a relatively low to a much higher level - This is a cyclic process.

Low fuel moisture means high combustion rates and thus short combustion periods.

A decrease in fuel moisture means an increase in available fuel and hence fuel energy. — Both promote an increase in fire intensity

Growing fire intensity in turn lengthens the critical burn-out time. This means an increase in fuel energy available for convection. This tends to establish a cycle of reinforcement which favors the growth of fire intensity.

As intensity grows both available fuel energy and the fuel energy available for convection increases still further (ie - crowning)

The atmospheric factors become increasingly more significant as the fuel energy available for convection continues to increase.

Eventually the point is reached when Pf (rate at which thermal energy is converted to kinetic energy at any height (z) above the fire) begins to exceed Pw (rate of flow of kinetic energy in the wind field at some height (z) above the fire) in the lower levels. Convection can now begin on a large scale if Pw decreases with height above the surface. This means the fire can build its convection column or chimney very quickly, and the most rapid part of the blow-up is underway.

Now spotting and ignition probability become dominant fire behavior factors. Whirlwinds and strong updrafts can produce ember showers over large areas of unburned

fuels. Turbulent rolls on the leading edge of the flame front may bring flame sheets in direct contact with fresh fuel.

After the rate of build-up has leveled off at a high intensity there will be a well developed convection column over the fire. The shape of a convection column is determined by the winds aloft. If there is a low-level jet wind, with a fairly deep zone of decreasing wind speed, the convection column will tend to curve upward slightly throughout the zone. If the speed of the winds above this zone is sufficiently low so that $P_f > P_w$ for an indefinite height, then the convection column will tower to a great height and form a white water-vapor cap. If above the zone of decreasing wind speed, there is a rapid increase in wind speed, so that at the higher levels $P_f < P_w$ the convection column will fracture, lose its updraft velocity, and tend to drift horizontally.

The direction in which spot fires are likely to occur can be anticipated by observing the direction in which the upper part of the column tends to lean and also the direction of smoke drift aloft if the column fractures. Spotting can occur on a large scale with type of column but seems to be worse with the latter.

The tendency of a fire to blow-up, or start to build a convection column, is more closely related to rate of total energy output than size of fire. It also depends on the wind profile and speed of the surface wind. If there is a low-level jet wind, the build-up of intensity will start very rapidly if the wind-speed maximum is at or near the surface.

INSTRUCTOR'S LESSON PLAN

BJECT SEA BREEZES	INSTRUCTOR J. G. SHEPHERD
TLE OF LESSON PREDICTING & IDENTIFYING SEA BREEZES	DATE OF INSTRUCTION D-4 2/02/76 D-7 2/17/76 D-8 1/22/76 D-13 2/18/76
ME PERIOD (TOTAL) 15 MINUTES	TYPE OF LESSON LECTURE W/AIDS
	PLACE 1/22 - D-8 2/17 - D-7 2/02 - D-4 2/18 - D-1

AINING AIDS

VU-GRAPH, PROJECTOR, & SCREEN

JECTIVE (S) TO FAMILIARIZE STUDENTS WITH FACTORS CAUSING SEA BREEZES AND PILOT METHOD PREDICTING AND IDENTIFYING PASSAGE OF SEA BREEZES.

STRUCTOR REFERENCE 1. DANE ROTEN'S LESSON PLAN "PREDICTING SEA BREEZE FRONTS"
DANSY T. WILLIAMS - "PREDICTING THE ATLANTIC SEA BREEZE IN THE SOUTHEASTERN STATES"

UDENT REFERENCE

ME	LESSON OUTLINE	AID CUES
	I. INTRODUCTION WE WILL LOOK AT A METHOD FOR PREDICTING SEA BREEZES. THIS METHOD IS BASED ON WIND DIRECTION AND SPEED, OCEAN TEMPERATURES AND MAXIMUM DAILY TEMPERATURES. THE DIFFERENCE IN TEMPERATURE OF THE OCEAN WATER AND THE TEMPERATURE OF THE LAND PRODUCES THE PRESSURE DIFFERENCES THAT CAUSES THE WIND TO BLOW. II. DEVELOPMENT A. REVIEW WHAT CAUSES A SEA BREEZE 1. AIR FLOW FROM AREAS OF HIGH PRESSURE TO AREAS OF LOWER PRESSURE. 2. PRESSURE DIFFERENCE IS CAUSED BY THE DIFFERENCE IN TEMPERAURE OF THE OCEAN AND LAND. a. LAND HEATS FASTER THAN WATER DURING THE DAY. b. LAND ALSO COOLS FASTER THAN WATER AT NIGHT.	WHAT CAUSES SEABREEZE You must have 60 difference to in temp. to have SEABREEZE HIGH LOW CONVECTION COLUMN SEABREEZE OVERIDE WINDS HIGH

3. OCEAN TEMPERATURE IS MORE CONSTANT AND DEPENDS MORE ON THE LENGTH OF THE DAY, OR SEASON OF THE YEAR, THAN ON DAILY ATMOSPHERIC TEMPERATURE.
   a. TEMPERATURE OF THE OCEAN RISES VERY GRADUALLY AND FALLS SLOWLY WHEN COOLING.
   b. CAN PREDICT THE TEMPERATURE OF THE OCEAN FOR A GIVEN DATE BY KNOWING WHAT THE TEMPERATURE WAS LAST YEAR (PLUS OR MINUS A FEW °)
4. LAND TEMPERATURE IS DEPENDENT ON DAILY TEMPERATURE.
5. WHEN THE TEMPERATURE OVER LAND IS WARMER THAN OCEAN THE WARM AIR OVER LAND RISES AND IS REPLACED BY COOL OCEAN AIR.

SEA BREEZE #1 VU-GRAPH

B. WHY ARE WE CONCERNED ABOUT SEA BREEZE?
   1. EFFECTS FIRE BEHAVIOR

SEA BRREZE #2 VU-GRAPH

      a. CHANGE IN WIND DIRECTION
      b. INCREASE IN WIND VELOCITY
         —CHANGE FIRE DIRECTION AND INCREASES RATE OF SPREAD.
      c. CREATE CONVECTION AT LEADING EDGE OF SEA BREEZE FRONT.
         —MAY FORM CONVECTION COLUMN AND PRODUCE A BLOW UP FIRE.
         —CONVECTION GOES AS IGH AS 7000'
      d. WIND SPEED MAY EXCEED 15 MPH (IN EXCESS OF 7m/sec)

C. PREDICTING SEA BREEZES
   1. NEED TO KNOW FOUR THINGS.
      a. WIND DIRECTION
      b. WIND SPEED
      c. MAXIMUM TEMPERATURE FOR TODAY (PREDICTED)
      d. TEMPERATURE REQUIRED FOR SEA BREEZE (FROM CHART)
   2. EFFECTS OF FOUR ELEMENTS
      a. WIND DIRECTION FROM LAND OR CAIM (LESS THAN 5 MPH)
         (1) OTHERWISE EFFECT WILL BE SLIGHT CHANGE IN DIRECTION AND INCREASE IN WIND SPEED.
      b. WIND SPEED - MUST BE 10 MPH OR LESS FROM LAND
         (1) IF MORE THAN 10 MPH SEA BREEZE UNABLE TO OVERCOME PREVAILING WINDS.

c. MAXIMUM TEMPERATURE IS MAXIMUM TEMPERATURE PREDICTED FOR THE DAY.

d. TEMPERATURE REQUIRED FOR SEA BREEZE IS 6 ° F ABOVE OCEAN TEMPERATURE OR OCEAN TEMPERATURE PLUS 6°F.

PRESENT "CHECK SHEET" - (DO NOT GO THROUGH THE NUMBERS)

D. RELIABILITY

1. SHOULD PREDICT 80% OR MORE SEA BREEZE DAYS IN D-7, D-4, & D-8.
2. ACCURACY MAY NOT BE AS GOOD IN D-13.
   a. DUE TO LARGE SOUNDS BETWEEN OCEAN AND MAINLAND.
   b. SOUNDS GET COLDER IN WINTER AND WARMER THAN OCEAN IN SUMMER.
3. METHOD WILL UNDER PREDICT SEA BREEZES AT LOCATIONS LESS THAN 5 MILES FROM THE OCEAN.
4. WILL OVER PREDICT AT LOCATIONS 25 MILES OR MORE FROM THE OCEAN.
5. TIME OF PASSAGE DEPENDS ON
   a. TIME OF DAY THE REQUIRED DIFFERENCE IN TEMPERATURE IS REACHED
      —THE EARLIER THE TEMPERATURE REQUIRED FOR A SEA BREEZE IS REACHED THE EARLIER THE SEA BREEZE WILL OCCUR.
   b. THE VELOCITY OF THE PREVAILING WINDS THAT THE SEA BREEZE MUST OVERCOME
      —EARLIER ON CALM DAYS
      —LATER ON DAYS WHEN WIND IS STRONGER
   c. DISTANCE LOCATION IS FROM THE OCEAN.
6. AVERAGE TIME FOR PASSAGE
   a. 1230 EST AT COAST
   b. 1900 EST INLAND AT 50 MILES.
7. STATIONS WILL BE USED TO MEASURE WIND SPEED AND DIRECTION. — "LOCATION CHART" VU-GRAPH

III. SUMMARY

A. SEA BREEZES ARE CAUSED BY DIFFERENCES IN TEMPERATURE OF OCEAN AND LAND MASS.

B. CONCERNED BECAUSE OF EFFECT ON FIRE BEHAVIOR.

2. CREATES CONVECTION.

C. CAN PREDICT DAY WHEN SEA BREEZE WILL OCCUR.

1. NEED TO KNOW FOUR THINGS.

a. WIND DIRECTION

b. WIND SPEED

c. MAXIMUM TEMPERATURE PREDICTED FOR TODAY

d. TEMPERATURE REQUIRED FOR A SEA BREEZE

D. RELIABILITY IS ABOUT 80% IN D-4, D-7, & D-8

1. PROBABLY LESS IN D-13.

E. AVERAGE TIME OF PASSAGE VARIES FROM 1230 EST AT COAST TO 1900 EST 50 MILES INLAND.

1. MAY OCCUR MUCH EARLIER OR MUCH LATER.

SCHOOL: COOPERATIVE FIRE SCHOOLS

LOCATIONS: WHITEVILLE, NEW BERN, FAIRFIELD, AND ELIZABETH CITY

SUBJECT: PRINCIPLES OF TRACTOR-PLOW FIRE LINE TACTICS

INSTRUCTOR: DANE ROTEN, REGIONAL FORESTER

METHOD: LECTURE AND SLIDE PRESENTATION

TIME: THIRTY MINUTES

TRAINING AIDS: BLACKBOARD AND CHALK, PROJECTOR AND SCREEN

DATES: JANUARY 22, FEBRUARY 2, 17 AND 18.

I. INTRODUCTION

A. TRACTOR & PLOW IS MOST EFFECTIVE FIRE SUPPRESSION TOOL IN USE TODAY.

1. DOES WORK OF SEVERAL HUNDRED FIREFIGHTERS WITH HAND TOOLS.

2. BECOME CARELESS IN THE WAY WE USE IT.

3. MOST OF TIME INCORRECT USE DOESN'T HURT.

(a) OVERWHELM FIRE WITH NUMBERS OF EQUIPMENT.

(b) MOST FIRES OCCUR ON DAYS WHEN FIRE BEHAVIOR ISN'T SEVERE.

4. ESSENTIAL TO LEARN AND PRACTICE CORRECT TACTICS ON ALL FIRES.

(a) MUST BE KNOWN BY FFEO AND SUPERVISORS.

(b) FORMS CORRECT HABITS.

(c) INSURES PROPER TACTICS ON THE TOUGH FIRES.

B. LOOK AT CORRECT TACTICAL USE OF TRACTOR-FIRE PLOW

1. POINT OUT PRINCIPLES INVOLVED IN EACH CASE.

2. LOOK AT THE INTER-ACTION OF THE FORCES INVOLVED.

3. FIRE SUPPRESSION TOO COMPLICATED FOR USE OF RULES.

(a) TOO MANY VARIABLES INVOLVED:

-- WEATHER

-- FUELS

-- TOPOGRAPHY

-- SUPPRESSION FORCE

4. WORK WITH PRINCIPLES BASED ON VARIABLES.

II. DEVELOPMENT

A. OBJECTIVES OF INITIAL ATTACK IS TO STOP THE HEAD OF THE FIRE.

1. BUILD IN INTENSITY WITH TIME.

(a) MORE DIFFICULT TO STOP AS TIME GOES BY UNTIL IT REACHES PEAK IN INTENSITY.

2. ATTACK HEAD FIRST IF YOU CAN DO IT SAFELY.

(a) JUDGMENT DECISION FOR THE INITIAL ATTACK FIRE BOSS TO MAKE.

(b) MAY BE FOREST FIRE EQUIPMENT OPERATOR THAT HAS TO MAKE THE DECISION.

(c) SAFETY IS BIG CONSIDERATION

-- TENTH STANDARD FIRE FIGHTING ORDER - <u>FIGHT FIRE AGGRESSIVELY, BUT PROVIDE FOR SAFETY FIRST</u>.

3. FIRES WHERE SAFE HEAD ATTACKS MIGHT BE MADE FIRST.

(a) SMALL FIRES NOT CROWNING

(b) FIRES IN LIGHT FUELS WITH GOOD TRAFFICABILITY

-- WIRE GRASS

-- YOUNG PLANTATION

(c) WHERE HEAD HAS BEEN KNOCKED DOWN BY INITIAL ATTACK BOMBER.

(d) BREAK AT HEAD OF FIRE.

4. METHODS OF ATTACKING HEAD FIRE:

(a) WITH BACKFIRE -

(1) LOOP LINE SO AS TO BOTTLE HEAD OF FIRE.

(2) EXTEND LINE FARE ENOUGH TO CATCH HEAD FIRE.

-- LOOP ENDS OF LINE TO HOLD BACKFIRE.

(3) BACKFIRE LINE AS IT IS DOUBLED BACK.

(4) PRINCIPLE - MUST MAKE BREAK WIDER THAN FIRE IS SPOTTING.

-- DISTANCE OF SPOTTING WILL INCREASE WHEN BACKFIRE MEETS HEAD FIRE.

-- RULE OF THUMB - MAKE BREAK AS WIDE AGAIN AS FIRE IS SPOTTING.

(b) BURNING OUT BETWEEN LINES METHODS:

(1) LOOP FIRST LINE TO BOTTLE FIRE.

(2) PLOW SECOND LINE GREATER DISTANCE THAN FIRE IS SPOTTING.

(3) TIE ENDS OF LINE TOGETHER.

(4) REINFORCE SECOND LINE.

(5) BURN OUT BETWEEN TWO LINES.

(6) ADVANTAGES: DOES NOT INCREASE DISTANCE FIRE IS SPOTTING.

-- WIDENS BREAK FASTER

-- DOESN'T HAVE INTENSITY OF HEAD FIRE

(7) DISADVANTAGES:

-- BURN OUT WITH HEAD FIRE HARDER TO HOLD.

(c) WITHOUT BACKFIRE

(1) LOOP LINE TO BOTTLE HEAD

(2) PLOW NUMEROUS LINES AHEAD OF FIRE - "TATTER PATCHING"

(3) PLOW SPOT FIRE

(4) BREAK MUST BE WIDER THAN FIRE IS SPOTTING.

(d) WHERE HEAD FIRE HAS BEEN KNOCKED DOWN BY INITIAL ATTACK BOMBER.

(1) PLOW AS CLOSE TO FIRE AS POSSIBLE

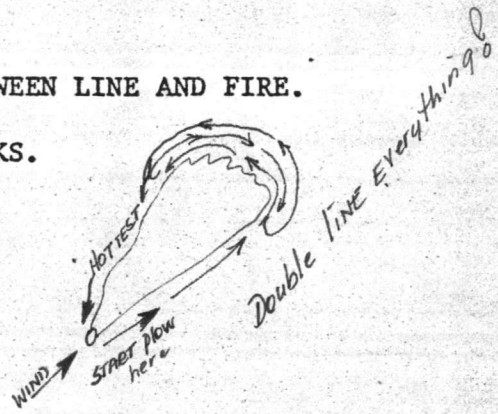
-- CANNOT BACKFIRE

-- ELIMINATE ALL FUEL POSSIBLE BETWEEN LINE AND FIRE.

(2) EXTEND AND LOOP LINES TO HOLD FLANKS.

(3) PLOW HOTTEST FLANK UP WIND.

(4) PLOW OTHER FLANK DOWN WIND.



B. FLANK ATTACK

1. SELECT FLANK TO ATTACK BASED ON FIRE SIZE-UP.

(a) WEATHER FORECAST

(b) KNOWLEDGE OF AREA

-- VALUES

-- SIZE OF WOODS

-- BREAKS

(c) OTHER THINGS EQUAL - ATTACK HOTTEST FLANK FIRST.

(d) ALL THINGS EQUAL - ATTACK COUNTER CLOCKWISE - RIGHT FLANK

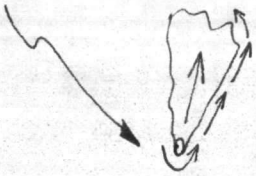
-- SEA BREEZE MAY BE EXCEPTION

GOOD to KNOW

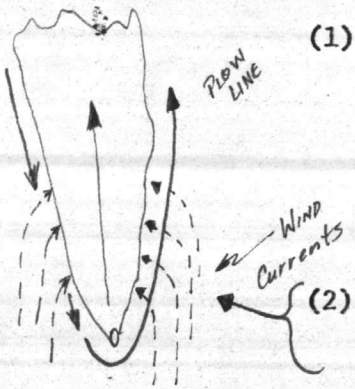
2. POINT OF ATTACK

(a) ANCHOR LINE TO BREAK IF ONE PRESENT - ROAD, DITCH, ETC.

(b) IF NO BREAK, LOOP LINE AROUND HEEL OF FIRE TO PREVENT BACKING AROUND LINE.



(c) DISTANCE FROM FIRE TO PLOW DOWN WIND -



(1) SAFETY STANDPOINT

-- THE CLOSER - THE SAFER

-- ELIMINATE ALL FUEL POSSIBLE BETWEEN LINE AND FIRE

-- FUELS BURNING SHORTER DISTANCE BACK OF TRACTOR

(2) PLOW CLOSE ENOUGH SO DRAFT CREATED BY FLANK FIRE WILL PULL BURN-OUT FIRE INTO FLANK FIRE.

-- GREAT ENOUGH TO PREVENT SPOTTING WHEN FIRES MEET.

-- FAR ENOUGH FOR LINE TO BE BURNED OUT BY HELPER COMFORTABLY.

(3) RESULTS OF PLOWING TOO FAR AWAY FROM FLANK.

-- BURNING OUT FIRE BECOMES HEAD FIRE.

-- RUNS DOWN ON TRACTOR FORCING IT FARTHER AWAY FROM FLANK.

-- BECOMES HEAD FIRE.

(4) RESULTS OF PLOWING TOO CLOSE TO FLANK.

-- TOO HOT FOR CREW BACK OF TRACTOR.

-- CHANCE OF SPOTTING OVER LINE.

-- FLAW OF WIND MAY LAY FLAME OVER LINE IGNITING FUEL OVER LINE.

3. PRINCIPLE OF BURNING OUT LINES -

(a) SAFETY

(1) ELIMINATES ALL FUEL QUICKLY PROVIDING ESCAPE ROUTE INTO BURNED AREA.

(2) ONLY ESCAPE ROUTE IF WIND SHOULD SHIFT.

(b) DISTANCE

(1) WITHIN 50 FT. OF TRACTOR ON HOT FIRES.

(2) OPERATOR CAN SEE SPOT OVERS.

4. PLOWING TECHNIQUES

(a) PLOW AS SHALLOW AS POSSIBLE TO CONSTRUCT CLEAN LINE.

(b) PLOW LINE AS STRAIGHT WITH THE WIND AS POSSIBLE (PARALLEL)

-- MAKE TURNS AS GRADUAL AS POSSIBLE - NEVER ABRUPT

-- TURN TOWARD FIRE TO PREVENT BURNING OUT FIRE FROM RUNNING.

-- KEEP LINES STRAIGHT AS POSSIBLE.

C. HEAD ATTACK AFTER PLOWING FLANK.

1. SAFETY, AGAIN, GREATEST CONSIDERATION

2. SITUATION:

(a) HEAD FIRE MOVING FASTER THAN FLANK FIRE TOWARD LINE.

(b) EFFECTIVE WIDTH OF LINE NOT AS GREAT - WIND DIRECTLY ACROSS LINE

-- FLAMES MAY IGNITE FUELS ACROSS LINE

-- EMBERS BLOW DIRECTLY ACROSS LINE.

(c) SINGLE LINE MAY NOT HOLD BACK FIRE.

(d) LOSS OF LINE MAY THREATEN CREW.

3. LINE MUST BE GREATER DISTANCE FROM FIRE THAN ON FLANKS.

(a) DISTANCE GREAT ENOUGH TO PROVIDE TIME TO CONSTRUCT BREAK WIDE ENOUGH TO STOP HEAD FIRE.

4. METHODS OF ATTACKING HEAD FIRES

(a) HOT HEADS - CROWN FIRES UNSAFE TO PLOW AROUND

(1) PLOW SHORT DISTANCE - DOUBLE BACK AND BURN OUT.

(2) CONTINUE PROCEDURE TO PINCH HEAD UNTIL AROUND HEAD.

(b) IN LIGHTER FUELS

(1) TWO LINES, BURN OUT METHOD

(2) DOUBLE LINE, BACKFIRE

(3) NUMEROUS LINES OR "TATTER PATCHING"

(c) WITH AERIAL DELIVERY

(1) IMMEDIATELY AFTER DROP

(2) COMPLETELY AROUND HEAD.

D. PLOWING FLANK UP WIND AFTER HEAD IS SECURED.

1. DISTANCE TO PLOW

(a) FARTHER AWAY TO AVOID BEING TRAPPED BY FINGERS OR POCKETS.

(b) PLOW AS NEAR INTO WIND AS POSSIBLE.

(c) KEEP BURNING-OUT - FIRE UP WITH TRACTOR = - FOR ESCAPE ROUTE.

(d) NEED AIRCRAFT FOR LOOKOUT IF ENTIRE FLANK CANNOT BE SEEN BY CREW.

III. SUMMARY

A. ATTACK HEAD FIRST

1. SAFETY

2. METHODS

(a) TWO LINE BURN-OUT

(b) DOUBLE LINE - BACKFIRE

(c) NUMEROUS LINES

3. PRINCIPLES

(a) CREATE BREAK WIDER THAN FIRE IS SPOTTING.

(b) BACKFIRE MEETING HEAD FIRE INCREASES DISTANCE OF SPOTTING.

(c) BREAK TWO TIMES AS WIDE.

B. FLANK ATTACK

1. ANCHOR LINE OR LOOP AROUND HEEL.

2. PLOWING FLANK

(a) PLOW AS CLOSE AS POSSIBLE.

(b) PLOW WITHIN DRAFT AREA TO PULL BURN-OUT FIRE IN.

C. HEAD

1. SAME AS PREVIOUS.

2. PINCH HEAD BY SECURING SHORT DISTANCE AT ALL TIMES.

3. AERIAL DELIVERY.

D. UP WIND FLANK

1. PLOW GREATER DISTANCE AWAY FROM FLANK.

(a) SAFETY REASONS - TO AVOID BEING TRAPPED.

(b) KEEP LINE STRAIGHT AND BURNED-OUT.

N. C. DIVISION OF FOREST RESOURCES

LESSON PLAN

TITLE:	Fire Size Up and Potential
SCHOOL:	1976 D-4 Cooperator Fire School
INSTRUCTOR:	Carl A. Turner, District Ranger
LOCATION:	Region I Headquarters
DATE:	February 2, 1976
TIME:	30 Minutes
METHOD:	Lecture
TRAINING AIDS:	Magnetic Board Overhead Projector Screen
OBJECTIVE:	To explain fire size up and potential so trainees can be able to size up fires and give potential and understand its importance.

I. Introduction

A. Why we need it

B. Who does it and when

C. What we need

II. Fire Size Up

A. Know area

1. Fuels

2. Roads

3. Ownership

4. Suppression equipment

a. Initial attack

b. Back up

B. Recent fire behavior

1. What it has been doing

C. Weather

1. Wind

a. Speed

b. Direction

c. Chance of sea breeze

d. Dust devils

D. Smoke column indicator

1. Size, color, height, shape and direction

2. Compare against what you expected and what you see

II. E. Approaching fire area

1. Roads and fuel types

2. People - write down license numbers

F. Arrival on fire

1. Look at total picture

2. The "size up" is where you begin to fight the fire

3. Factors to consider

a. Size

b. Location of head

c. Time of day

d. Values threatened

e. Weather at fire

f. Safety

g. Traffic ability

4. With this in mind, complete the size up by determining the control capability or fire potential.

III. Potential Determination

A. Go over card

B. Go over examples on card

C. Secret weapon

1. Large tankers limited

2. Importance and effective use

D. Recognize project fire when small

E. Limited equipment

IV. Summary

A. Before fire occurs

1. Area

2. Behavior

3. Weather

B. After fire occurs

1. Smoke

2. Approaching

3. On scene

4. Factors to consider

C. What this means to you and me

1. Equipment

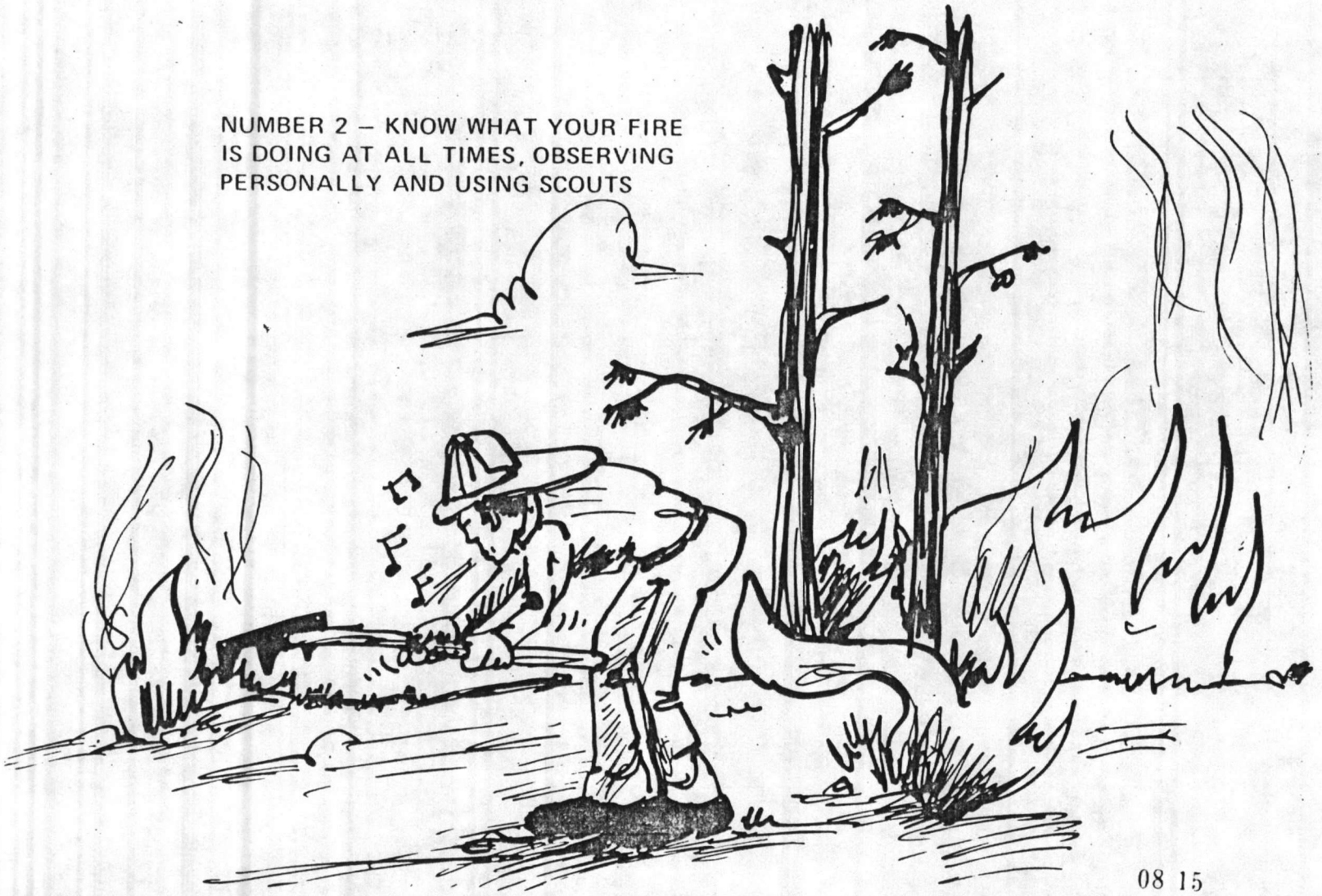
2. Tankers

3. Each work together

10 FIRE FIGHTING ORDERS

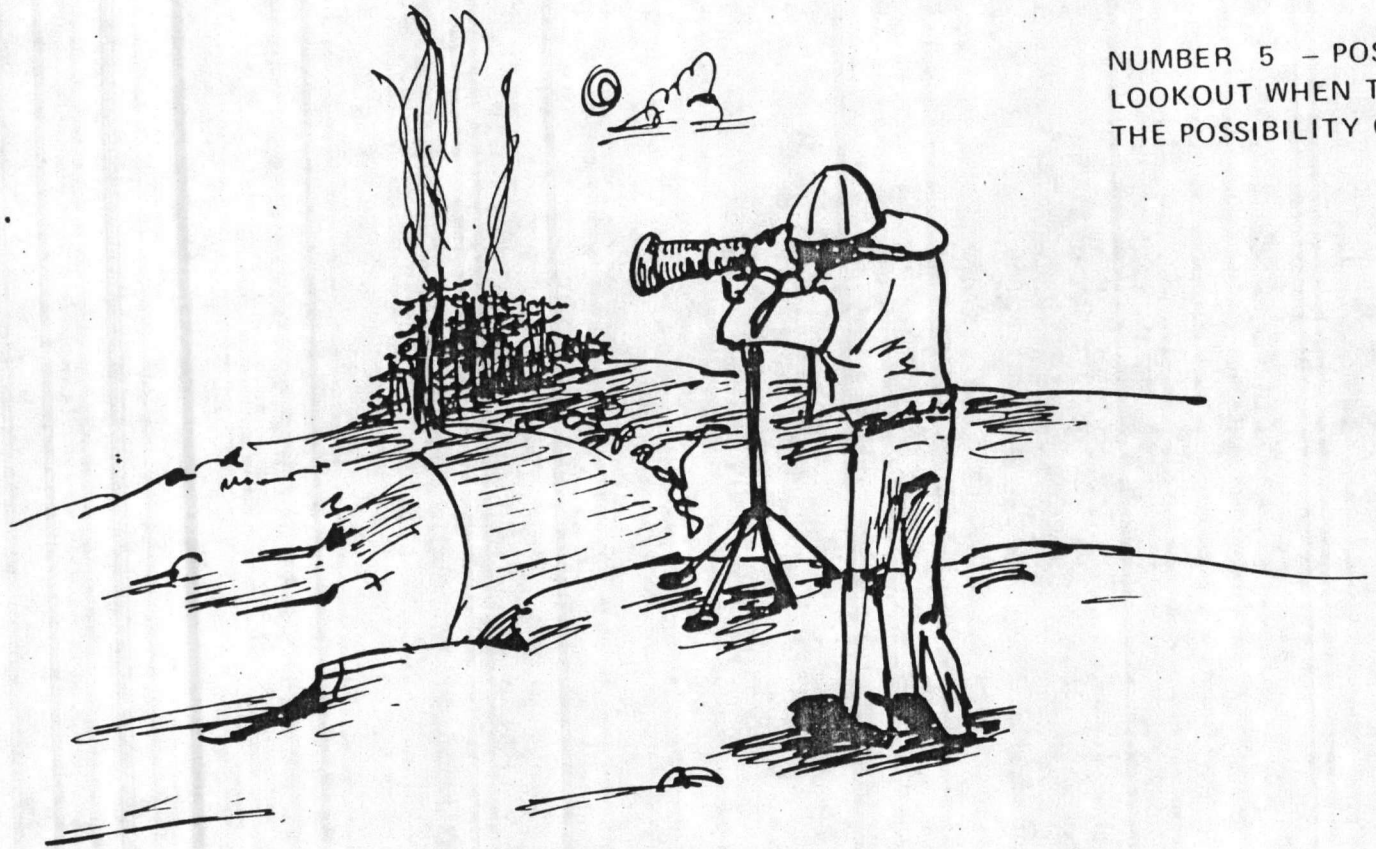
NUMBER 1 – KEEP INFORMED ON FIRE WEATHER CONDITIONS AND FORECASTS

NUMBER 2 – KNOW WHAT YOUR FIRE IS DOING AT ALL TIMES, OBSERVING PERSONALLY AND USING SCOUTS

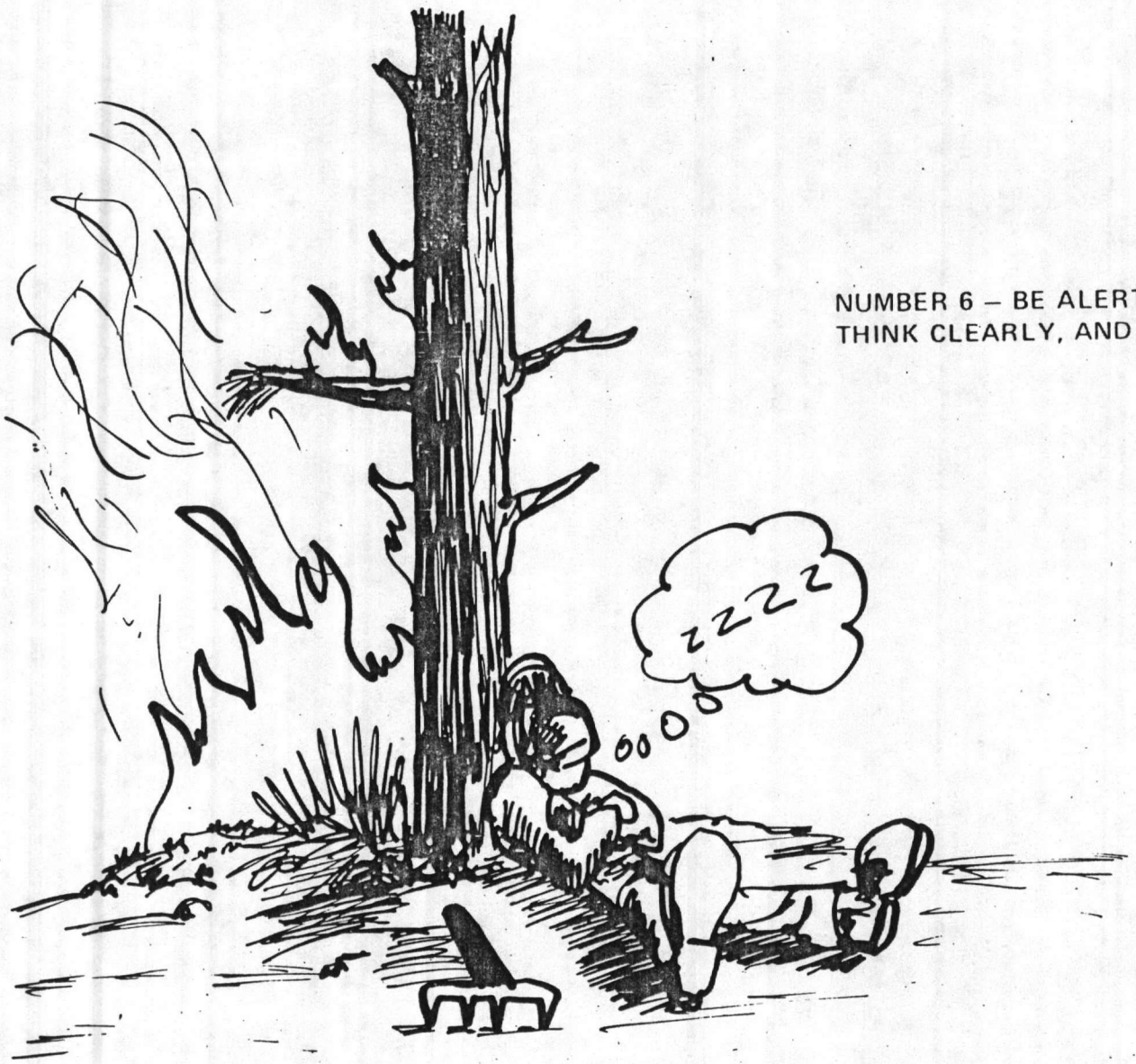


NUMBER 3 — BASE ALL ACTIONS ON
CURRENT AND EXPECTED BEHAVIOR OF FIRE

HAVE ESCAPE ROUTES FOR EVERYONE AND MAKE THEM KNOWN – NUMBER 4



NUMBER 5 – POST A
LOOKOUT WHEN THERE IS
THE POSSIBILITY OF DANGER

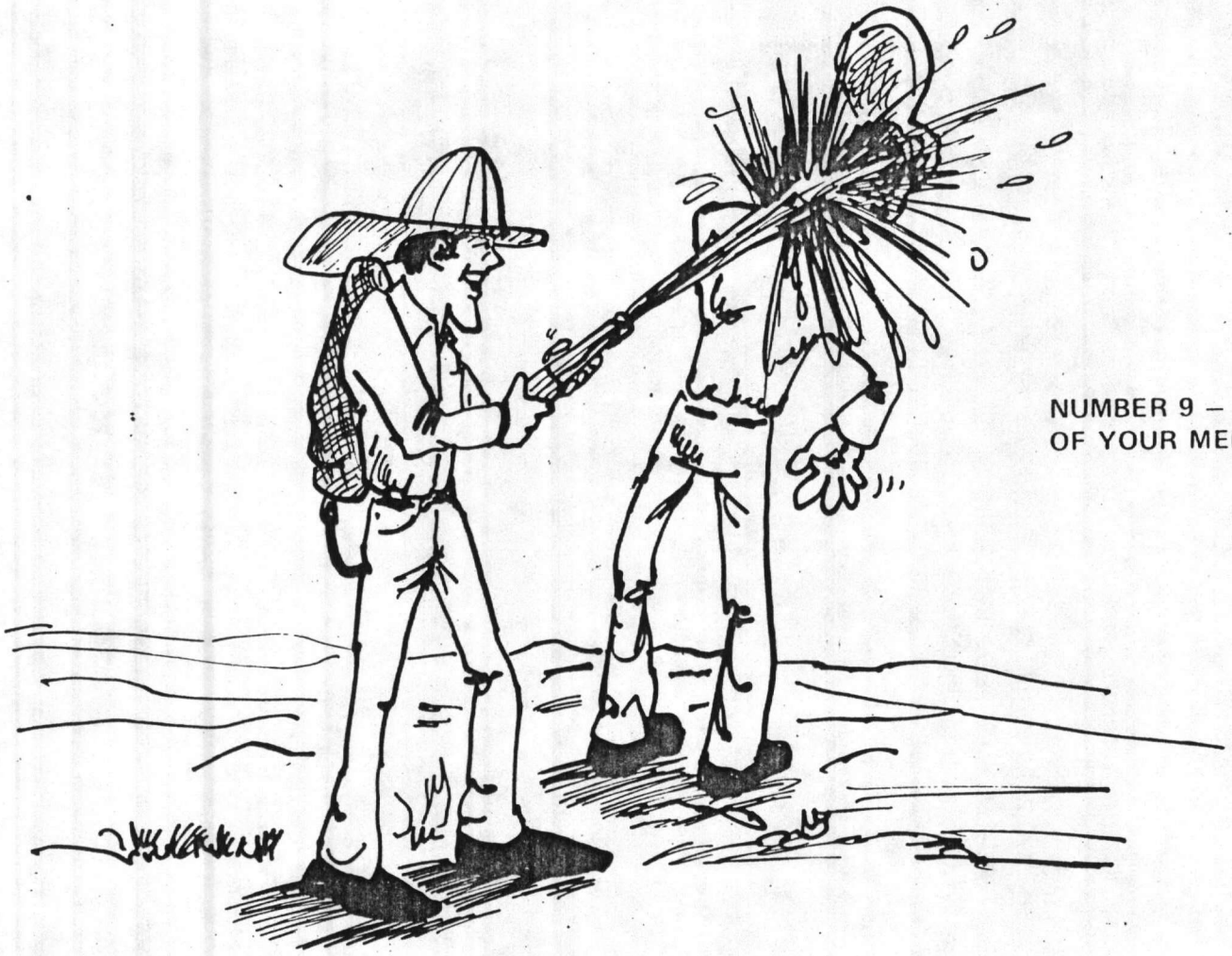


NUMBER 6 – BE ALERT, KEEP CALM,
THINK CLEARLY, AND ACT DECISIVELY

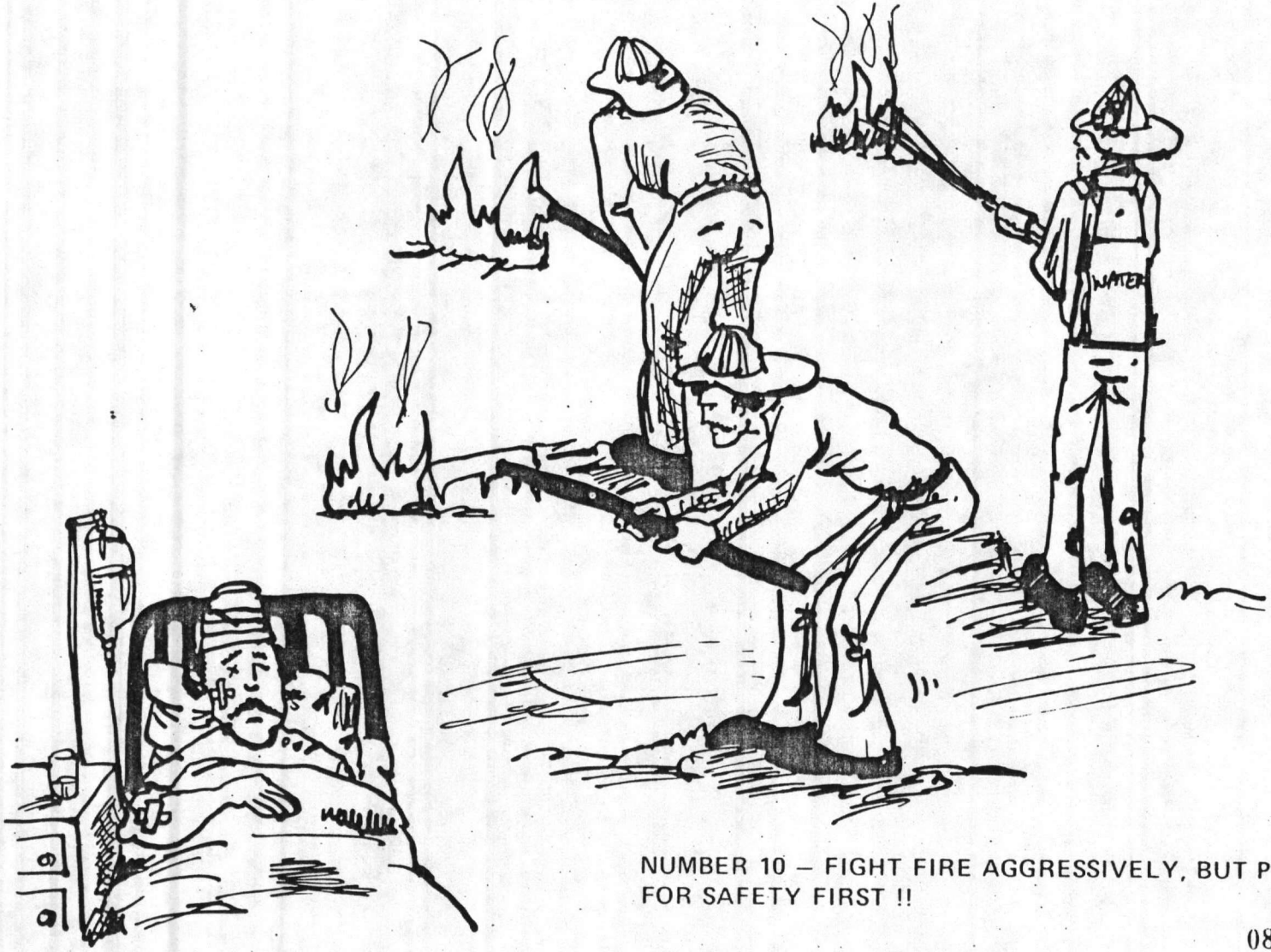
NUMBER 7 – MAINTAIN PROMPT COMMUNICATION WITH YOUR MEN, YOUR BOSS, AND ADJOINING FORCES

NUMBER 8 – GIVE CLEAR INSTRUCTIONS AND BE SURE THEY ARE UNDERSTOOD

ASK QUESTIONS IF THE INSTRUCTIONS ARE NOT CLEAR TO YOU !!

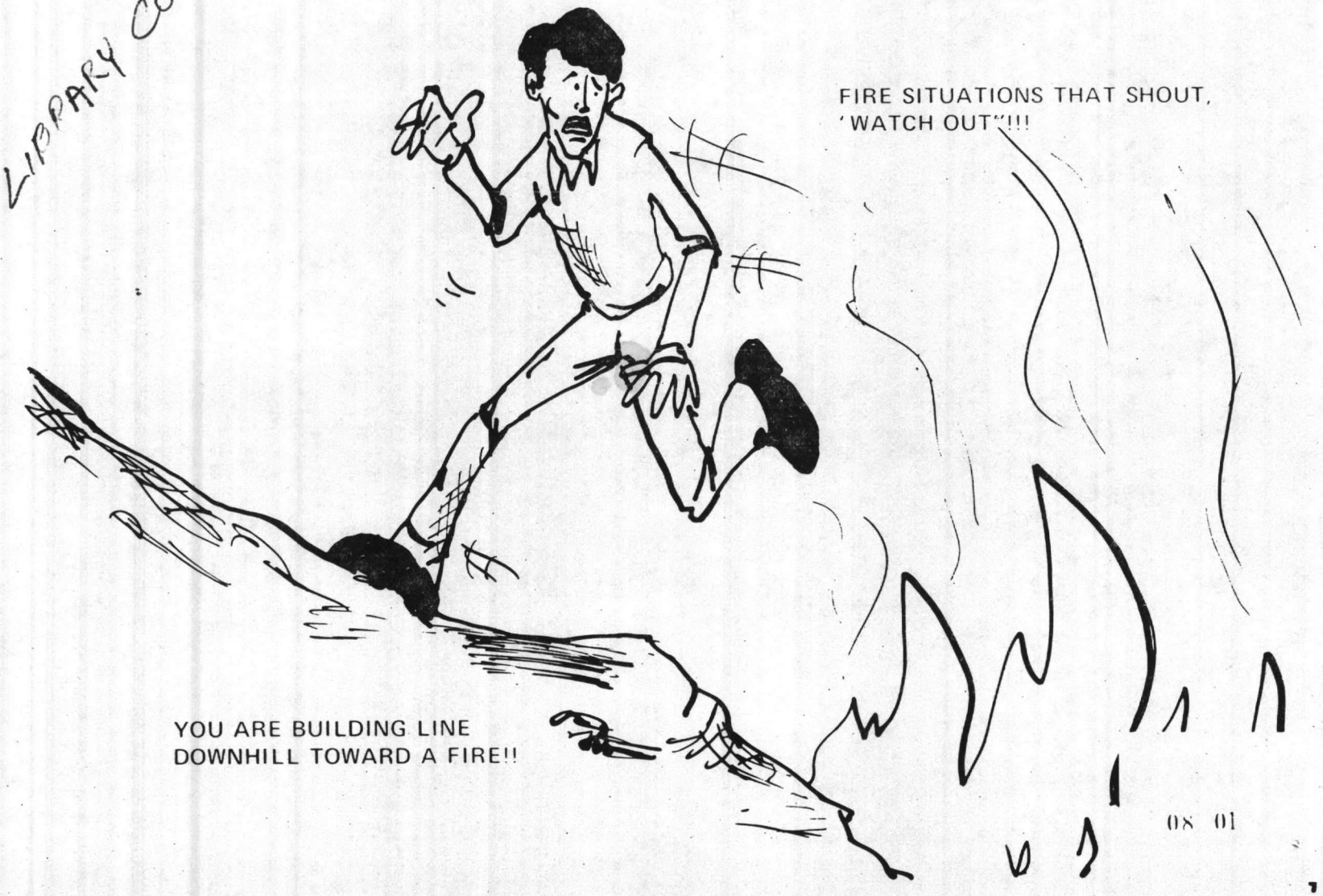


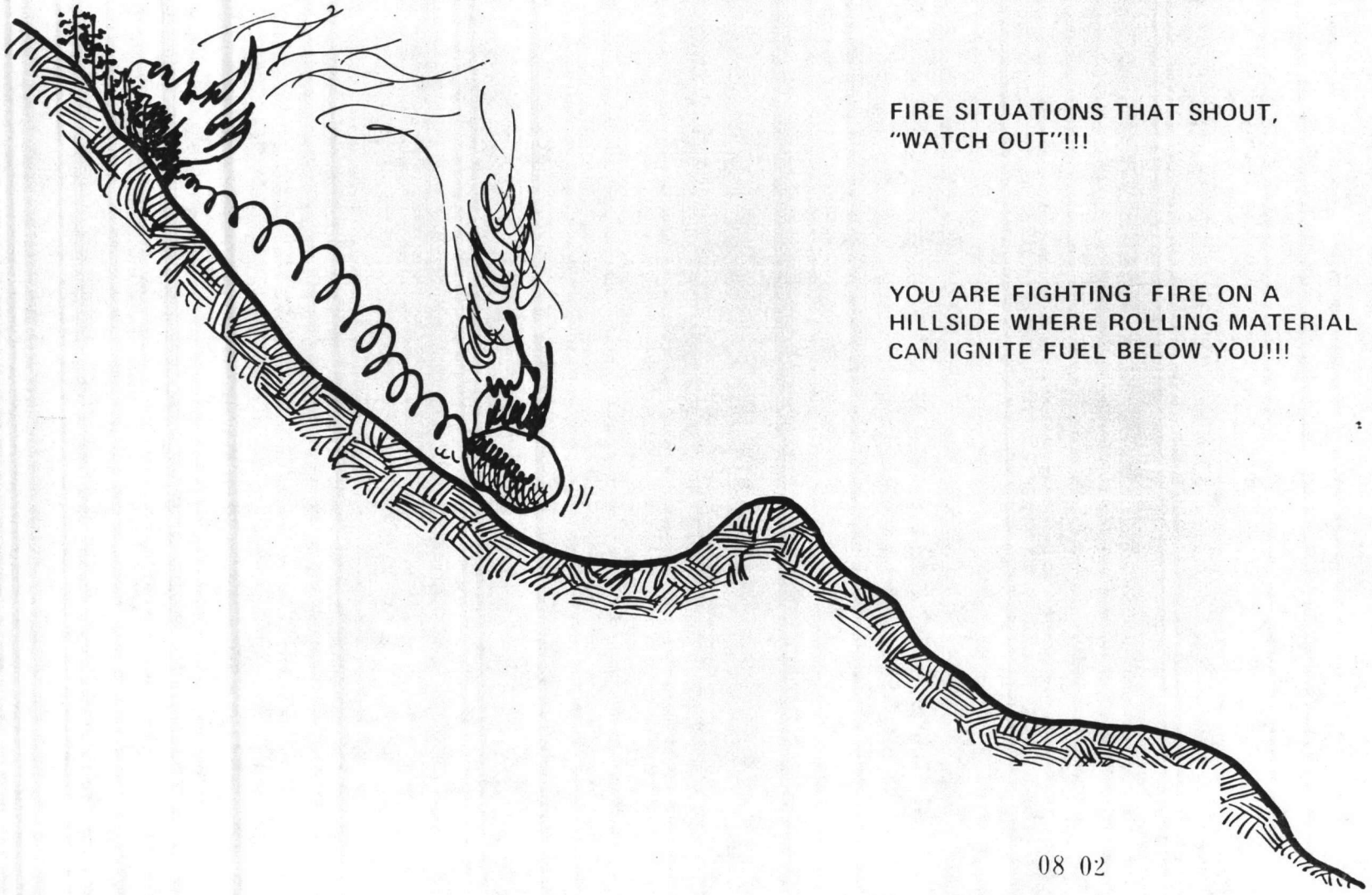
NUMBER 9 – MAINTAIN CONTROL
OF YOUR MEN AT ALL TIMES



NUMBER 10 – FIGHT FIRE AGGRESSIVELY, BUT PROVIDE FOR SAFETY FIRST !!

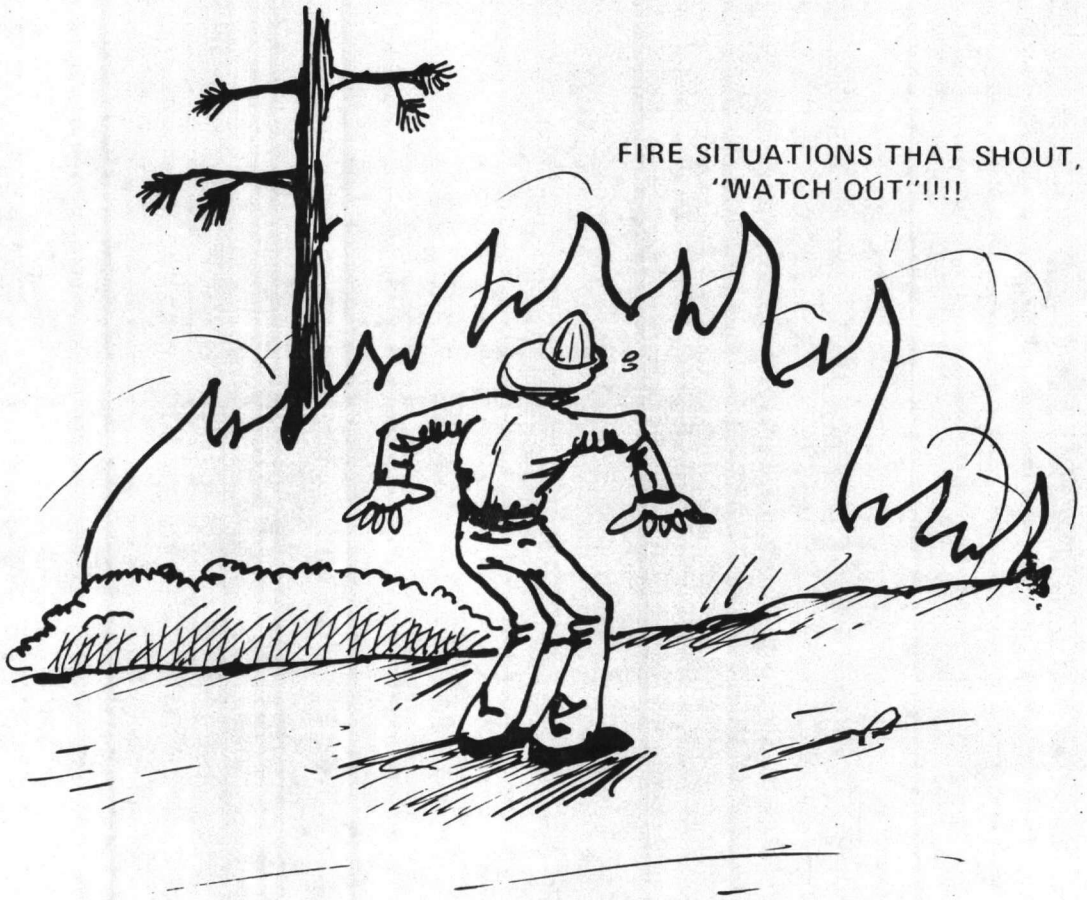
13 SITUATIONS THAT SHOUT WATCH OUT



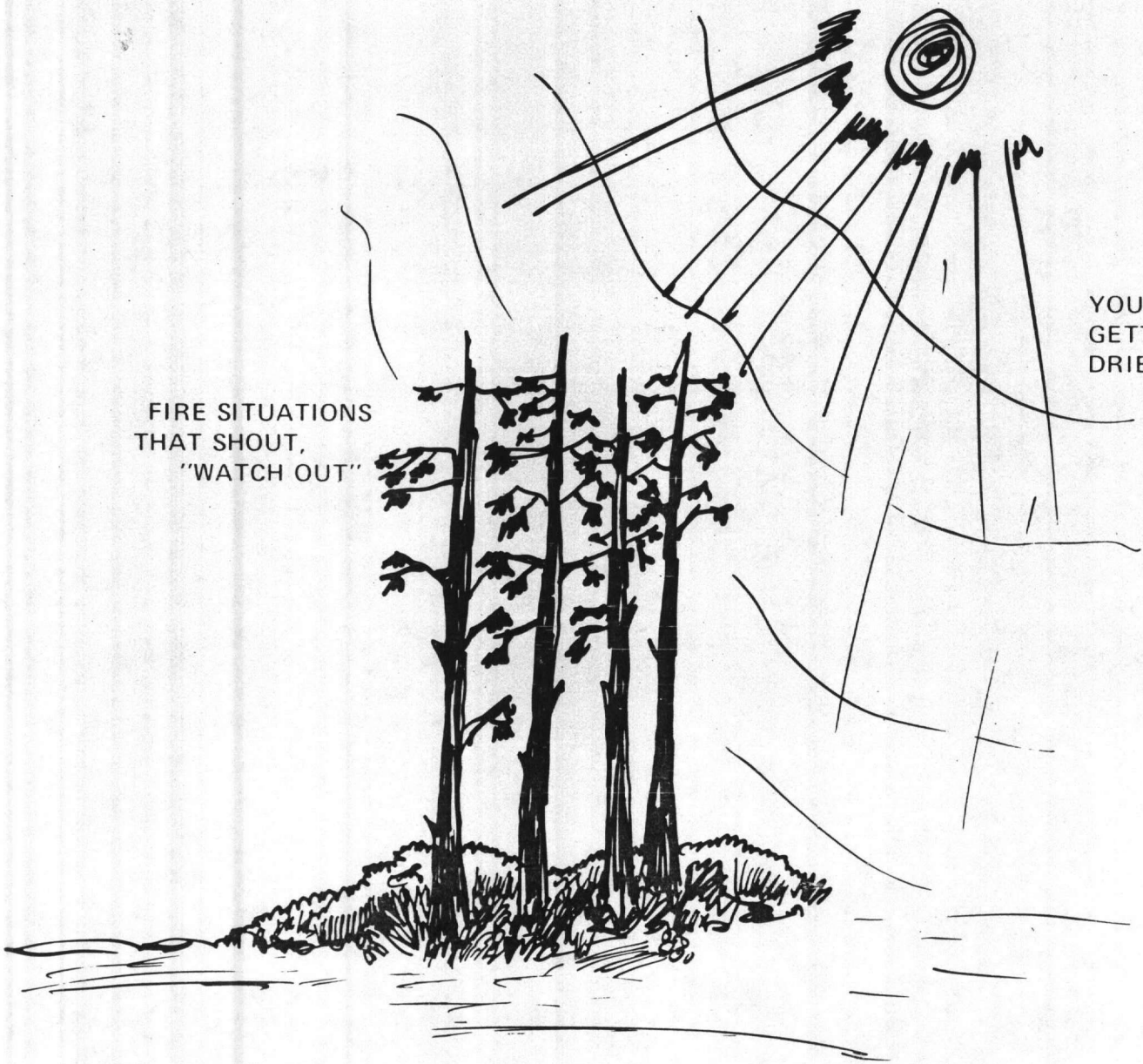


FIRE SITUATIONS THAT SHOUT,
"WATCH OUT"!!!

YOU ARE FIGHTING FIRE ON A
HILLSIDE WHERE ROLLING MATERIAL
CAN IGNITE FUEL BELOW YOU!!!

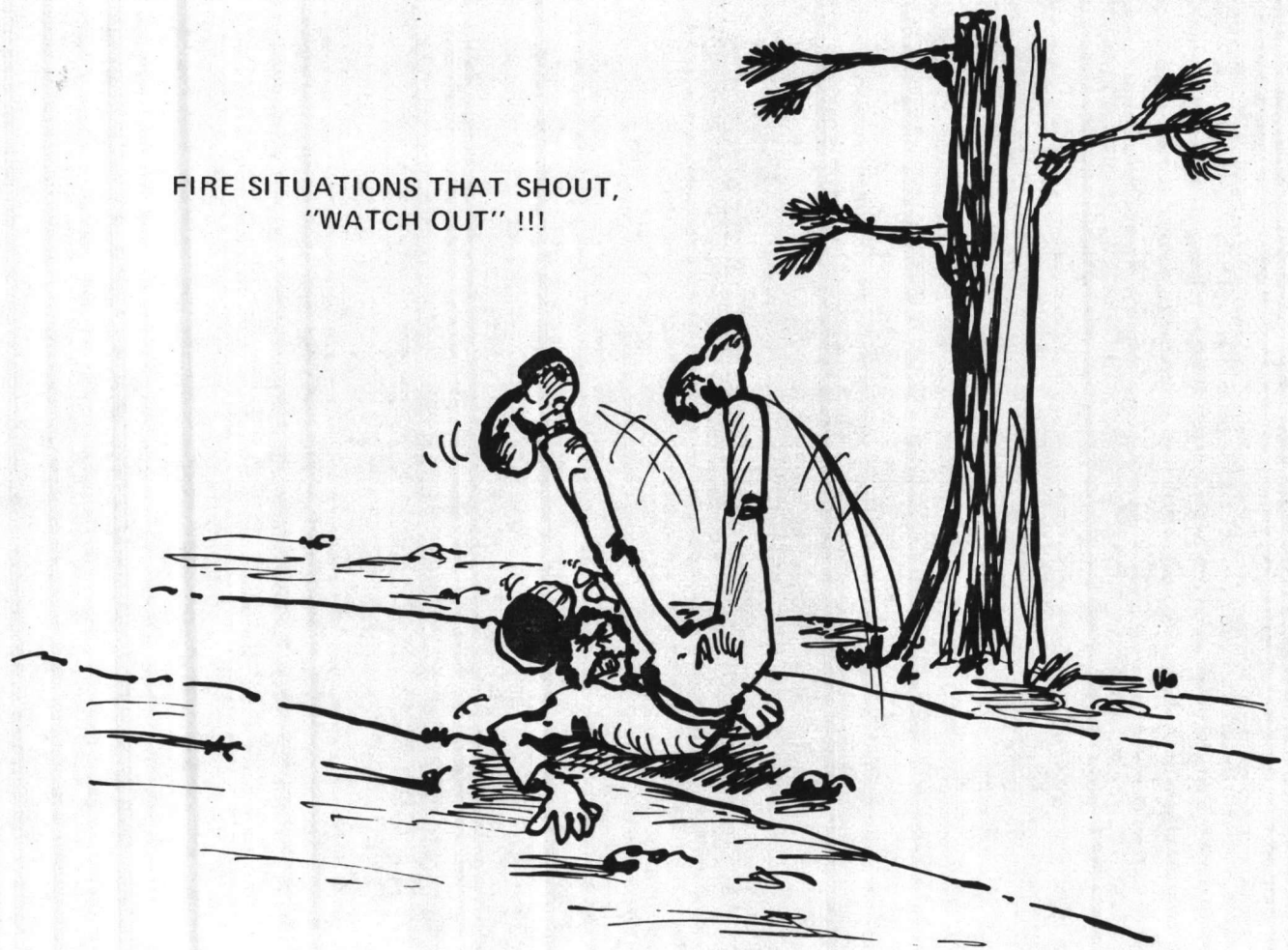


YOU NOTICE THE WIND BEGINS TO BLOW OR INCREASE OR CHANGE DIRECTION


FIRE SITUATIONS
THAT SHOUT,
"WATCH OUT"
YOU FEEL THE WEATHER
GETTING HOTTER AND
DRIER

08 05

FIRE SITUATIONS THAT SHOUT,
"WATCH OUT" !!!

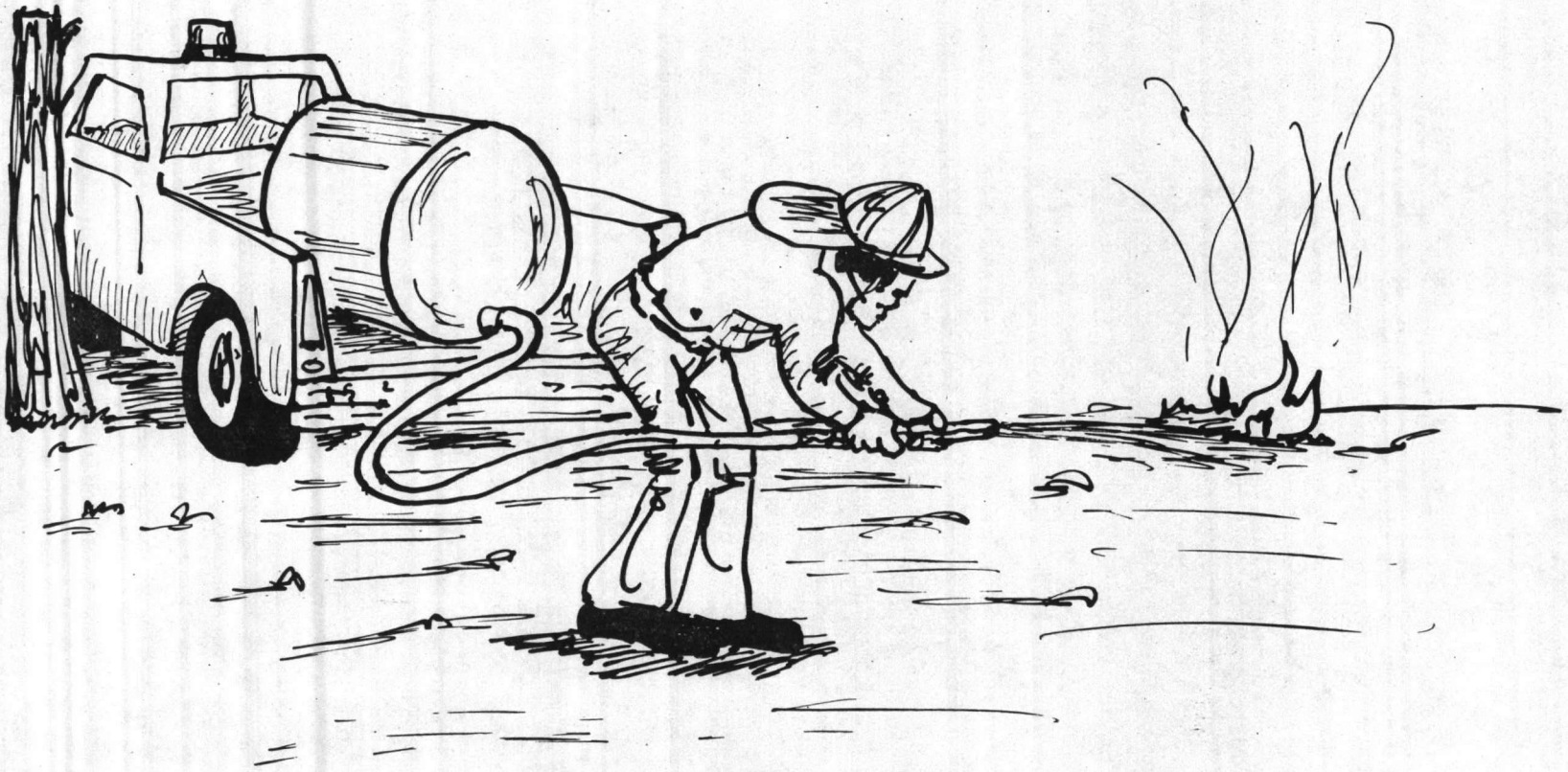


YOU ARE AWAY FROM THE BURNED AREA WHERE TERRAIN AND / OR COVER
MAKES THE TRAVEL DIFFICULT AND SLOW


YOU ARE IN COUNTRY
THAT YOU HAVE NOT
SEEN IN THE
DAYLIGHT!!!
"WATCH OUT '!!!
08 07

FIRE SITUATIONS THAT
SHOUT, "WATCHOUT" !!

YOU ARE IN AN AREA WHERE
YOU ARE UNFAMILIAR WITH
LOCAL FACTORS WHICH INFLUENCE
FIRE BEHAVIOR

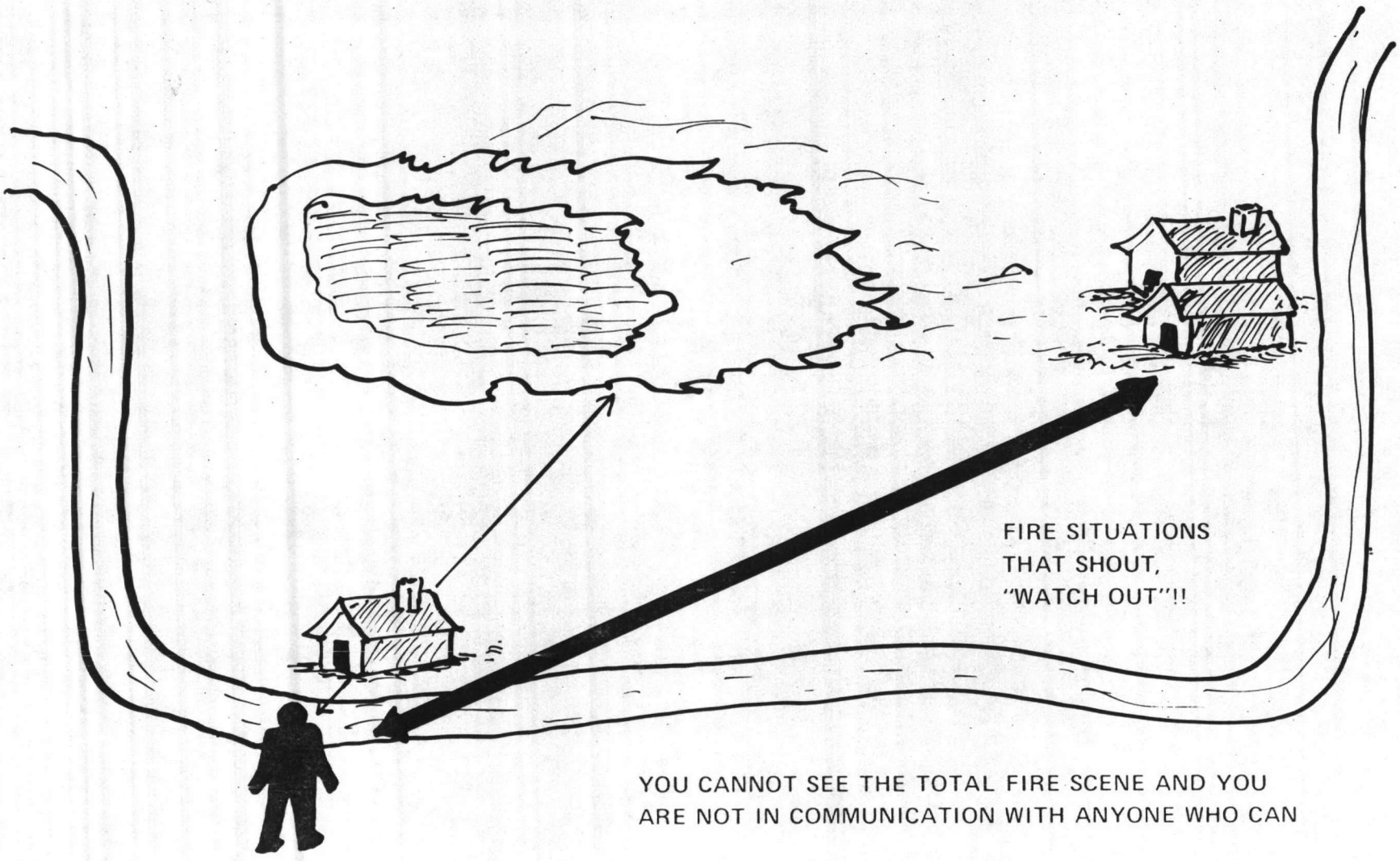


FIRE SITUATIONS THAT SHOUT, "WATCH OUT"!!!

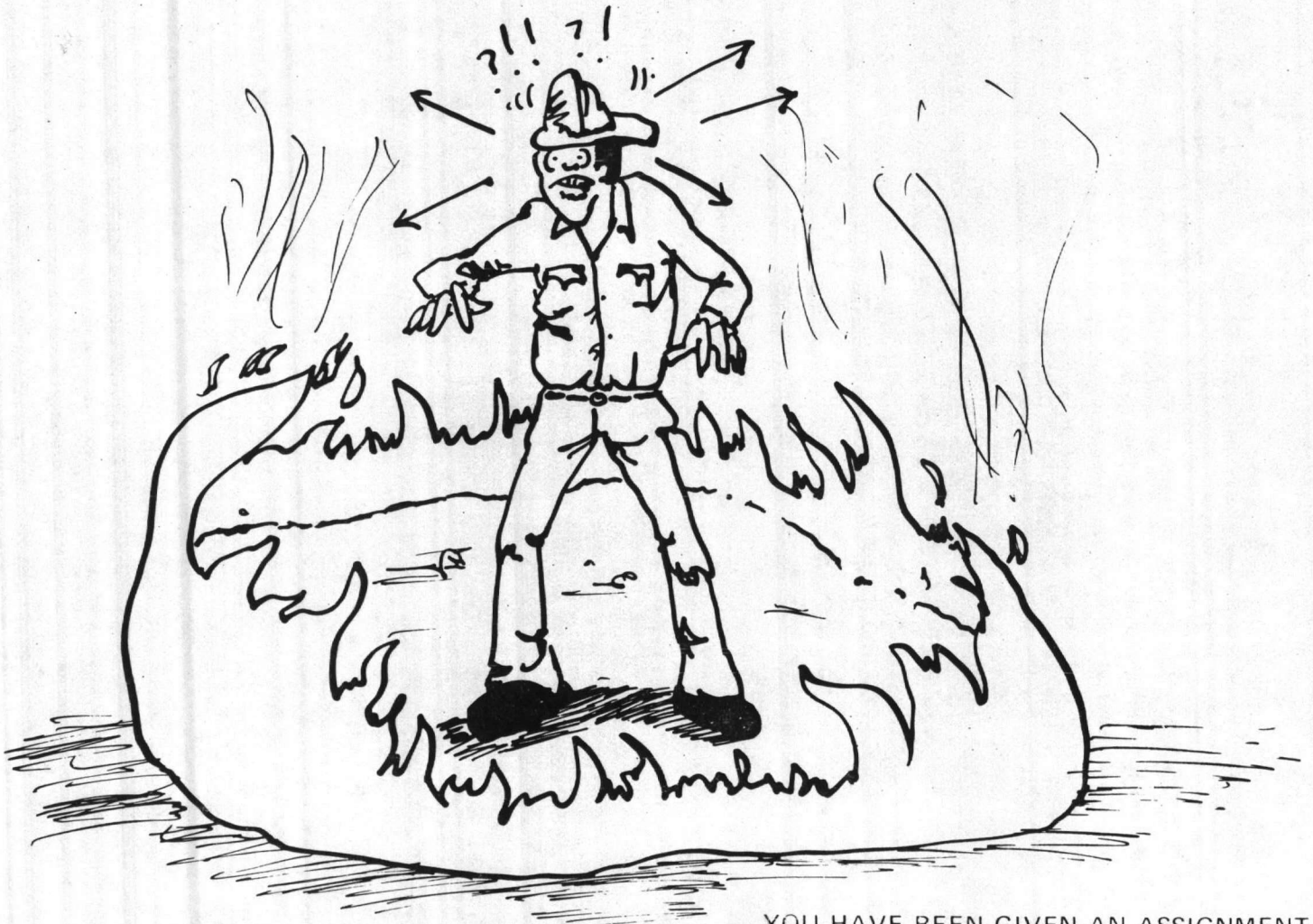
YOU ARE ATTEMPTING A FRONTAL ASSUALT ON A FIRE WITH A TANKER

FIRE SITUATIONS THAT
SHOUT, "WATCHOUT"!!!

YOU ARE GETTING FREQUENT SPOT
FIRES OVER YOUR LINE

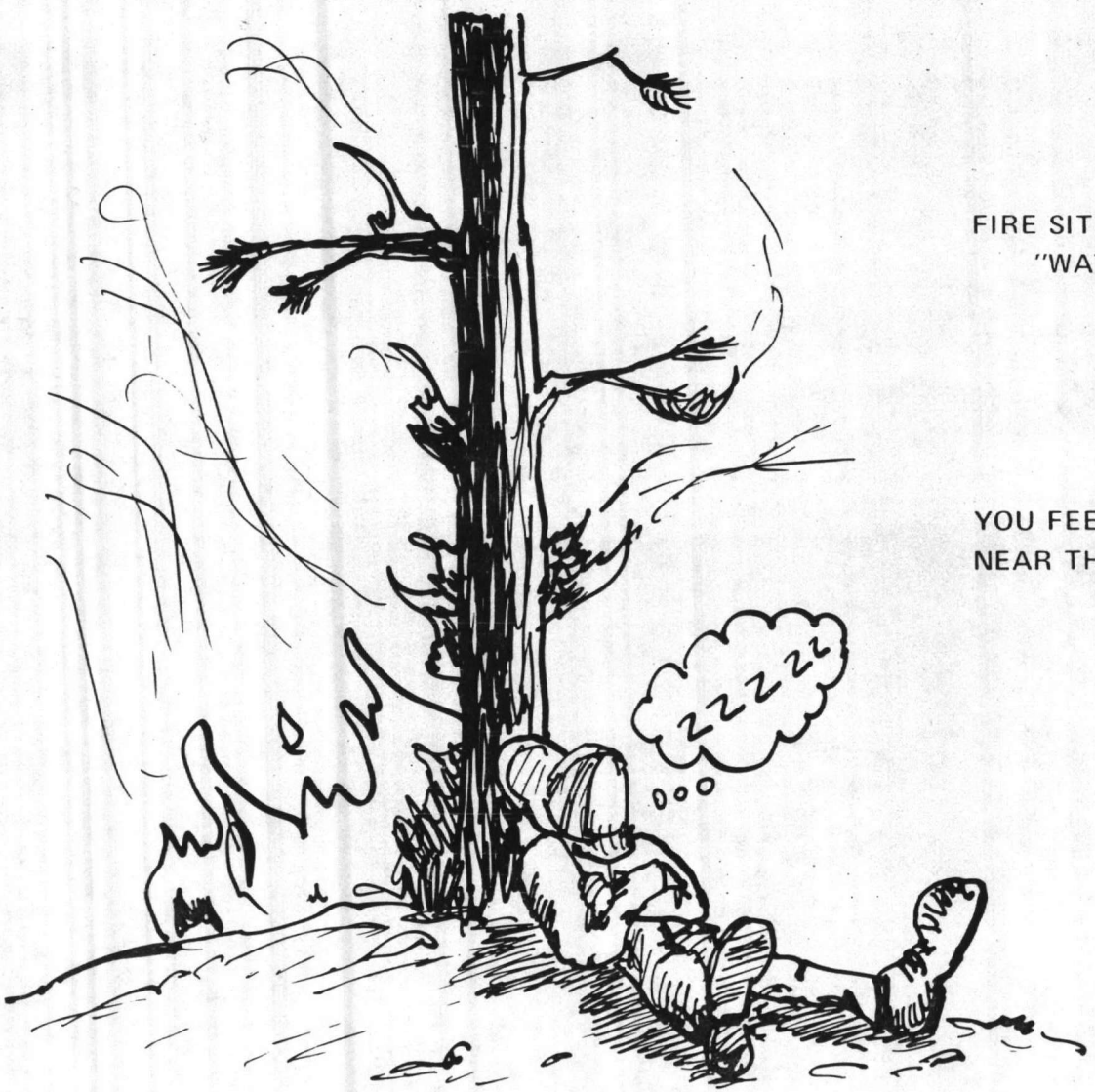


YOU CANNOT SEE THE TOTAL FIRE SCENE AND YOU
ARE NOT IN COMMUNICATION WITH ANYONE WHO CAN



FIRE SITUATIONS THAT SHOUT, "WATCH OUT"!!

YOU HAVE BEEN GIVEN AN ASSIGNMENT
OR INSTRUCTIONS UNCLEAR TO YOU



FIRE SITUATIONS THAT SHOUT,
"WATCH OUT"!!!

YOU FEEL LIKE TAKING A NAP
NEAR THE FIRE LINE!!!!

dated and unusable structures
radius of 15 meters, said Cpl. Nicholas Ruffolo, an instructor in the machine-gun section.

The newest MK-19s "are just getting fielded. We have the only five mod threes at Camp Lejeune," said 1st Lt. Greg Sumner, officer in charge of ITS weapons training.

"They're in the process of phasing it in to the 2nd Marine Division. It should be issued soon," Sumner said.

ssible targets include enemy onnel, fortifications, lightly mored vehicles, trucks and jeeps.

The MK-19 "is belt-fed, air-cooled and blow-back operated," Ruffolo said.

"The gases from the round blow the bolt to the rear and that in turn picks up another round ready to fire," the corporal said.

"It is accurate. It's as accurate as the .50-caliber machine gun. When

more effective round, the lieutenant said.

It is served by a three-man crew. They are the team leader, gunner and ammunition bearer.

The MK-19 weighs 75.6 pounds and is 43.5 inches long. It is usually transported while mounted on a jeep and can be fired from that position or from a tripod.

The new versions will be assigned along with .50-caliber machine guns

Lejeune under fire ban

By RICHARD F. SMITH
Daily News Staff

Marines at Camp Lejeune remain under Class Four fire restrictions due to dry and windy conditions, according to Sgt. Joseph Steele of the base Joint Public Affairs Office.

A ban on outdoor burning continues to be in effect for all coastal sections of North Carolina.

"The no-burn ban issued by the state Forestry Service is the same as our Class Four," Steele said.

Marine fire restrictions are graded from one to five, with five being the most stringent.

"With Class Four, the fire danger is very high. Pyrotechnics are restricted to the G-10, N-1 and K-2 impact areas," Steele said.

"Smoking is permitted only in locations designated by the training unit commander. Those areas will be fireproofed and supervised by an NCO. Use of generators will also be restricted to those areas," the spokesman said.

Burning of heat tablets for cooking Meals Ready to Eat is also limited to fireproof areas and no fires for warmth are allowed under Class Four.

"Two fire-fighting details are to be kept on standby alert during training," the sergeant said.

A smoke canister used by New River air station Marines during maneuvers in the Holly Shelter Game Management area last week caused a blaze which burned 4,000 acres in Pender County.

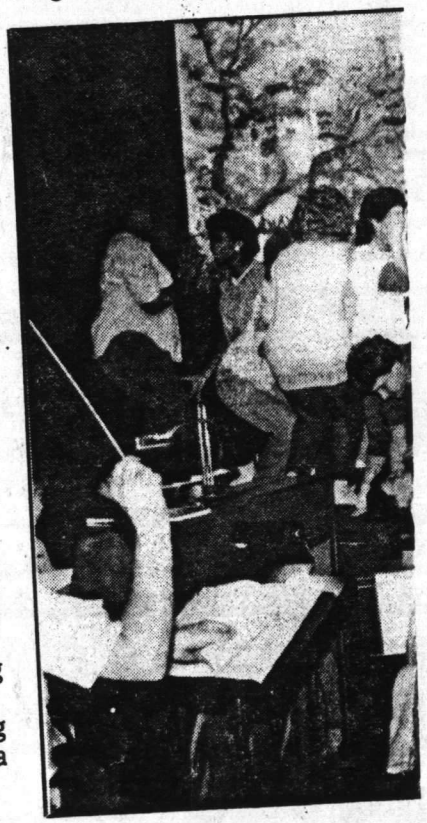
The fire spread to a tract owned by the International Paper Co.

New River spokesman Staff Sgt. Robert Jackson said high winds that scattered sparks from the canister were primarily responsible for the blaze.

BALL SHIT

Bill Williams, unit forester with International Paper, could not be reached for comment this morning on whether his company will bill the Marine Corps for damages caused by the fire.

Use of such canisters would be restricted at Lejeune to the three impact areas under Class Four restrictions, Steele said.



The cast of the White Oak High of the musical "Bye, Bye, Bi preparation for performances Saturday. To begin at 8 each n be held in a gymnasium that h

Onslow jury to decide arn

By CLIFF HILL
Daily News Staff

The Onslow County Superior Court jury hearing the armed robbery trial of a former Marine is expected to begin deliberating today.

Timothy Leon Hamm, 19 — administratively discharged from the Marine Corps Feb. 13 with a less-than-honorable discharge — is on trial for the Dec. 10 armed robbery of Whizz Mart on North Marine Boulevard.

The state rested its case Wednesday afternoon after testimony by the store's clerk, a bartender, three senior Marine staff non-commissioned officers, several police

person who entered the store about 7:25 p.m., looked around and left only to return a short time later. Mrs. Barnes said that she was mopping the floor at the rear of the store when he returned and that when she asked if she could help him, he told her, "Give me all your money." She told the court she saw a knife in his left hand when he repeated the order.

Mrs. Barnes said the knife had a 3- to 4-inch blade and he held it about waist high with the cutting edge down.

She told the court he followed her to the enclosed area where the cash register was and as she went inside, he went around the enclosure. She said when she opened the cash register, he leaned over, looked inside and

Mrs. Barne
burgundy swe
down each
bell-bottom bl
She told th
before, when
or six month
name and ph
She said sh
because it wa
the phone nun
Mrs. Barn
occassion, H
and she noti
During trial
shirt and swe

Sgt. Cliff
testified Ha

11 June 85

RECOMMENDATION FOR PERFORMANCE AWARD
MCBCL 12451/1 (REV. 4-83)

TO: Assistant Chief of Staff, Facilities (Approving Official) DATE: 10 June 1985

VIA: Administrator, Incentive Awards Program (Ref: BO 12451.1—)

In accordance with the reference, consideration for the award herein described is recommended for the employee(s) named below.

RECOMMENDED BY	POSITION (Title, Location) AND NAME OF ACTIVITY
Julian I. Wooten	Director, Natural Resources and Environmental Affairs Division, Marine Corps Base, Camp Lejeune

EMPLOYEE (Name: Last, First, M.I.) PAYROLL NO.	POSITION (Title and Location)	GRADE	ANNUAL BASE PAY
DENNIS, Robert C.	Forestry Technician, NREAD	GS-6	$17,110
BECKER, Daniel T.	" " "	GS-5	15,350
HUFF, Sanford	Equipment Operator, Base Maintenance	WG-10	$ 22,665
GOODSON, Donald	" " " "	WG-10	$ 22,665

(Attach a list for additional employees)

1. BASIS FOR AWARD RECOMMENDATION

☐ QUALITY INCREASE ☐ SUSTAINED SUPERIOR PERFORMANCE ☒ SPECIAL ACT OR SERVICE

DATE(S) OF ACHIEVEMENT/PERFORMANCE FROM: 25 Apr 85 TO: 26 Apr 85

AMOUNT OF CASH AWARD $ 500 PERFORMANCE RATING: DATE

2. ESTIMATE OF BENEFITS

A. INTANGIBLE BENEFITS: ☐ SAFETY ☐ IMPROVED METHOD ☐ MORALE ☒ OTHER (Specify) Property Protection

VALUE ☐ MODERATE ☒ SUBSTANTIAL ☐ HIGH ☐ EXCEPTIONAL

EXTENT OF APPLICATION ☐ LIMITED ☒ EXTENDED ☐ BROAD ☐ GENERAL

B. TANGIBLE BENEFITS *(In table below compute labor savings at actual cost.)*

ITEM	LABOR			MATERIAL			TOTAL (Labor and materials)
	MAN-HRS. PER	DOLLARS PER	TOTAL	UNITS PER	COST PER UNIT	TOTAL	
FORMER METHOD		$	$		$	$	$
NEW METHOD							
SAVINGS							

3. DESCRIPTION OF ACHIEVEMENT/JUSTIFICATION: (Need not be lengthy but should clearly show the employee's performance substantially exceeded established job requirements. To warrant award consideration there must be clear evidence of superior performance, exceptional achievement or a contribution worthy of recognition.)

1. On the afternoon of 25 April 1985 a wildfire near Cape Carteret on the Croatan National Forest was burning out of control. The U.S. Forest Service requested fire suppression assistance from the U.S. Fish and Wildlife Service; North Carolina Forest Service; N.C. Wildlife Commission; U.S. Forest Service Regional Office; Marine Corps Air Station, Cherry Point, and Marine Corps Base, Camp Lejeune.

2. Camp Lejeune officially received the request for mutual assistance at 1545. Two fire plow suppression units, operators, and groundmen were dispatched to Carteret County. The proposed award recipients worked under severe conditions with the highest level of professionalism and technical expertise late into

(Continue Description on Reverse)

(ITEM NO. 3 CONTINUED)

Thursday night. The Camp Lejeune units, along with one U.S. Forest Service tractor and one N.C. Forest Service tractor, constructed the first successful fire lines to contain the head of the fire.

3. After returning to the Base at 0200 hours on 26 April for a brief four and one-half hour rest, the Camp Lejeune team returned to the Croatan National Forest where they helped contain a major breakout from the original fire. They worked through the second day with crews from other agencies of federal, state and local governments to effectively contain the fire, returning to Camp Lejeune at 2000 hours. The fire had consumed approximately 5,700 acres of timberland and one home. Since much of the burned forestland was adjacent to private lands and housing developments, the losses may have easily been much more dramatic and costly.

4. Although mop-up crews and support groups from various agencies and Camp Lejeune continued to monitor the fire for the next several days, the work performed during the initial attack was an exemplary display of what properly trained and equipped personnel can accomplish, even under the most severe conditions. These employees have brought credit to themselves, Marine Corps Base, Camp Lejeune, and the U. S. Marine Corps. Comments concerning the outstanding performance, professionalism and motivation of the Camp Lejeune team were received from Roger Eubanks, Fire Boss from the U.S. Forest Service, Regional Office in Atlanta; Paul Bullard, District Ranger, Croatan National Forest; Brad Jenkins, Chief Fire Control Officer, Croatan National Forest; and Carl Turner, District Ranger, N. C. Forest Service.

5. It is recommended the Base employees nominated herein be granted special achievement awards based on intangible benefits. Since the estimated damages from the fire are known to have exceeded $100,000 and potential for much higher losses were averted by the cooperative effort between several dedicated individuals as well as the nominees, the exact monetary value is subject to interpretation.

(Use additional sheets as necessary) (CONTINUED)

4. ACTION BY APPROVING OFFICIAL. (Technical review by Civilian Personnel Division required before completing Item 4.)

A performance award in the amount of $ is hereby:

_____ Approved. The recommended award meets current requirements.

_____ Disapproved. The recommended award does not meet current requirements. (State reason(s) for disapproval.)

NAME AND TITLE	SIGNATURE	DATE

6. A cash award of $500.00 for each employee is recommended based on intangible benefits of substantial value with extended application, for the critical role they played while risking their own safety during this fire.

NATURAL RESOURCES AND ENVIRONMENTAL AFFAIRS
Marine Corps Base
Camp Lejeune, North Carolina 28542

4-11-85
Date

From: Director
To: Peter Black
Subj:

Let's hold this letter until end of fire season.

Julian

R
U
F
F

Base ltrhead

5200
NREAD

From: Commanding General, Marine Corps Base, Camp Lejeune, North Carolina
To: Mr. Ralph Collum, District Forester, North Carolina Forest Service, District Office, New Bern, North Carolina

Subj: LETTER OF APPRECIATION

1. I would like to take this opportunity to thank you for the rapid response and excellent support given by the Onslow County units of the North Carolina Forest Service in assisting Camp Lejeune personnel on 2 April 1985 in controling the forest fire aboard Camp Lejeune.

2. Due to the combination of extreme fire weather, the size of the fire (380 acres) and the fact that two of the government tractors were stuck on the left flank of the fire, the cooperation of the North Carolina Forest Service was essential. With the help of the State tractors, fire lines were established and secured on the right flank of the fire. These lines protected the Combat Town training area and the Marines and equipment which were bivouaced in the area.

3. The outstanding performance and professionalism demonstrated by the North Carolina Forest Service personnel is a tribute to themselves and the NCFS.

3. Please extend my sincere thanks to Mr. Donald Edwards, Mr. Mike Jarvis, Mr. Billy Cox, Mr. Glenn Baker and Mr. Terry Hancock for a job well done.

UNITED STATES MARINE CORPS
Natural Resources and Environmental Affairs Division
Marine Corps Base
Camp Lejeune, North Carolina 28542

IN REPLY REFER TO:
5200
NREAD
5 Apr 1985

MEMO FOR THE RECORD

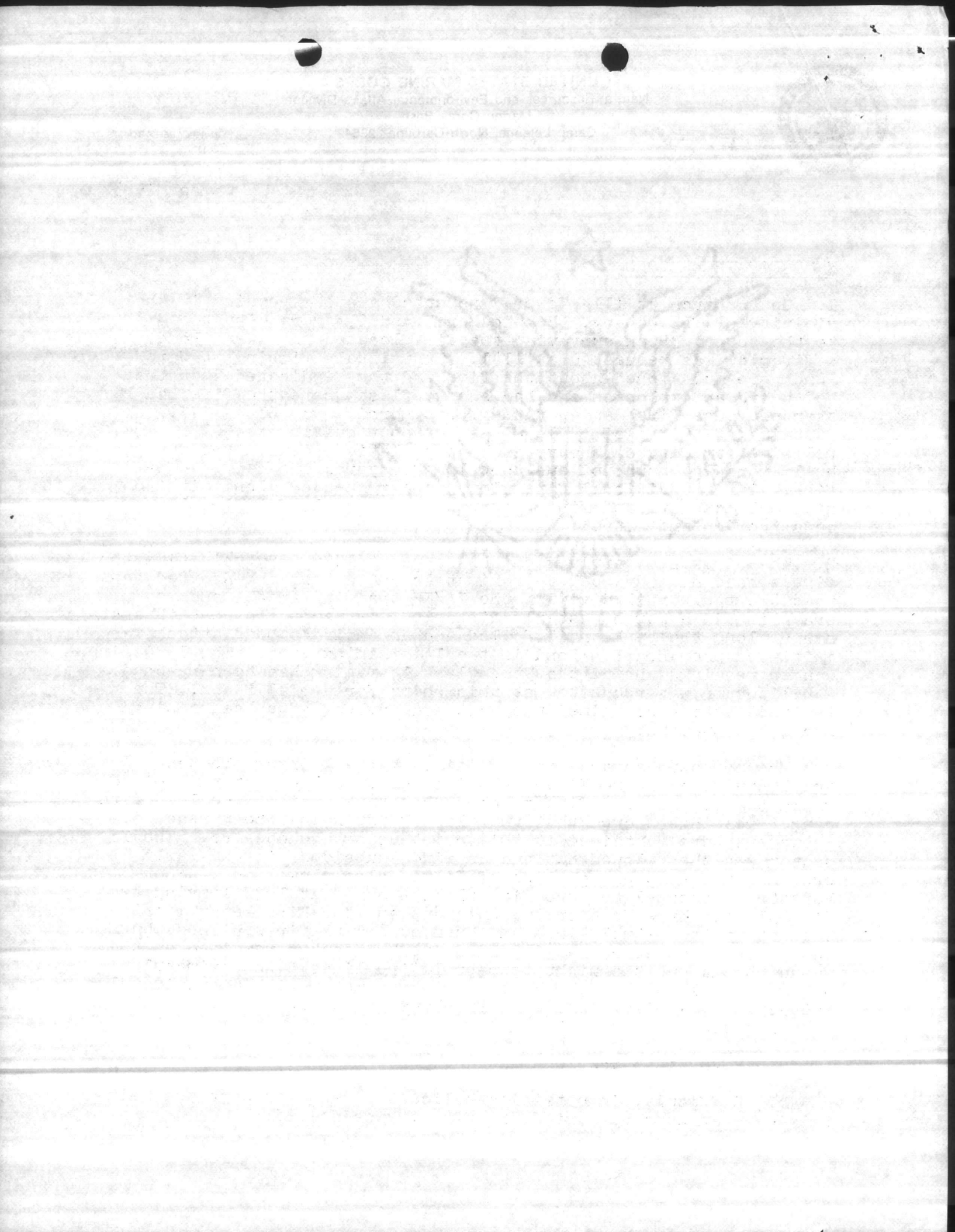
1. On 28 March at 1114 Tower 3 reported a smoke reading in the vicinity of TLZ Canary. Boondocker 7 and 9-8 were dispatched to the scene. Upon surveying the fire located near Ward Pond, a fireplow was requested at 1141. Individuals fishing at Ward Pond were questioned about the fire and they indicated that they had heard an explosion and had seen a flash where the fire had started. The fire danger rating that morning was Class III. Sustained SW winds of 14-18 miles per hour gusting to 30MPH, low relative humidity and heavy fuel accumulations caused the fire to build rapidly, burn hot and spot 100-200 yards ahead of the main fire. Three additional fire plows were requested along with additional forestry and Fire Department personnel, for fire line construction and patrol.

2. The first plow arrived on the scene at 1230. By this time the fire's head had advanced approximately 500 meters and spotted across the tank trail dividing the IA/IE training areas, and was traveling in a north easterly direction. Attempts to contain spotovers along the tank trail failed and an indirect head attack was initiated near Hog Pen Pond in the IA training area. The 1300 fire danger readings showed that the Class IV rating had been reached. A helicopter was requested at this point for aerial recon. The indirect attack contained the eastward advance after containing several spotovers.

3. The northern advance was contained by backfiring the tank trail dividing HB and IA and plowing two fire lines at the point where the second head fire reached that tank trail. The 1700 fire danger readings showed that the Class V rating had been reached. Spotovers were contained at this point using boondockers. The IE sector was then plowed out and as winds subsided, in the early evening, the southern portion of IA was also plowed out. Four Forestry personnel and two fire plows secured at 1930 leaving two fire plows, three Forestry technicians and two Fire Department boondockers to patrol lines and burn out flank fires. These burnout fires were secured at 0030 and one boondocker remained on the scene throughout the night to patrol fire lines. Approximately 655 acres fell within the containment perimeter with approximately 200 acres remaining unburned. Problems encountered during the fire included:

a. High winds and long distance spotting.

b. Difficulty in obtaining helicopter recon support and maintaining that support during the time it was needed.



c. Winch problems on two tractors.

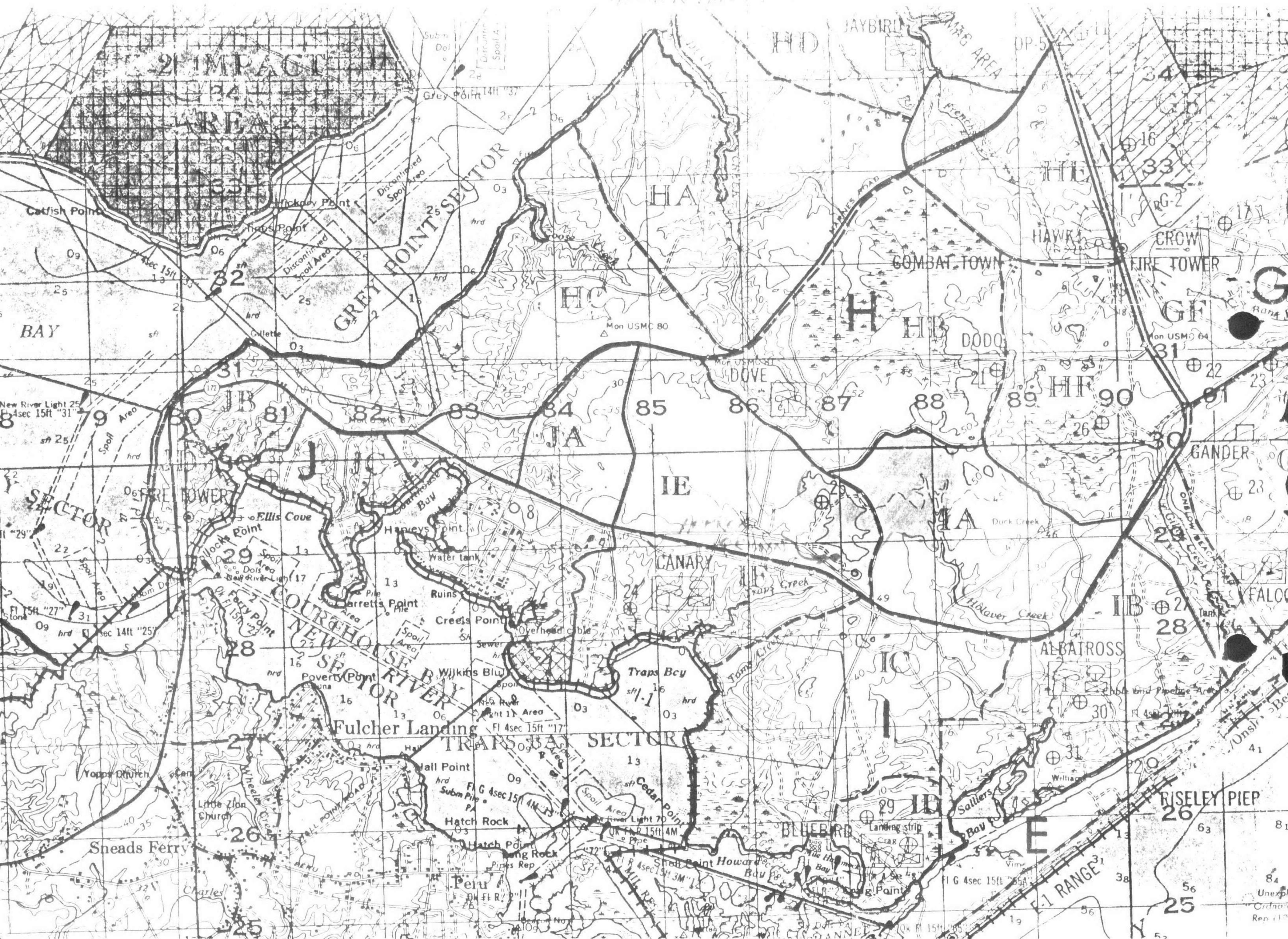
d. The fourth plow dispatched was not low ground pressure and had a straight blade mounted, making off-road use difficult.

e. Food was not made available for crews working until 0030.

J. R. GIBBS

P. E. BLACK, Base Forester

J. I. WOOTEN, Director 4-5-85


IMPACT AREA
GREY POINT SECTOR
Catfish Point
Hickory Point
Traps Point
Grey Point
Discontinued Spoil Area
BAY
Gillette
JAYBIRD
HD
HA
HC
HE
H
HB
HF
GF
COMBAT TOWN
HAWK
CROW
FIRE TOWER
DODO
DOVE
Mon USMC 80
HAYNES ROAD
JB
JA
JC
J
IE
IA
IF
IB
IC
ID
I
E
CANARY
GANDER
ALBATROSS
BLUEBIRD
Duck Creek
Traps Creek
Holover Creek
FIRE TOWER
Ellis Cove
Harveys Point
Water tank
Garretts Point
Ruins
Creeks Point
Overhead cable
Wilkins Bluff
Poverty Point
COURTHOUSE BAY
NEW RIVER SECTOR
Ferry Point
Traps Bay
Fulcher Landing
TRAPS BAY SECTOR
Hall Point
Hatch Rock
Hatch Point
Long Rock
Cedar Point
Shell Point
Howard Bay
Landing strip
Salliers Bay
Yopps Church
Little Zion Church
Sneads Ferry
Peru
RISELEY PIER
F-1 RANGE