

A

TORNADO PROJECT SUMMARY SHEET

F=1

ONT

1. DATE AND TIME MON MARCH 30, 1981 1300 EST

2. LOCATION OR PATH (attach map) VENTY BOTHWELL 0698102

damage area = 0.05 km²

3. PATH LENGTH NOT KNOWN <1mi; 1-4mi; 5-10mi; 11-50mi; LENGTH IF >50m 2.8 km

4. PATH WIDTH 18 m 5. TORNADO PART OF SQUALL LINE? YES; NO; UNKNOWN:

6. ANY UNUSUAL COLORATION? YES; NO; UNKNOWN

7. ANY UNUSUAL SOUND? YES; NO; UNKNOWN

8. IF ANSWER TO 6 OR 7 YES, ELABORATE; "A ROAR"

9. LIST ANY ASSOCIATED PHENOMENA (Such as hail, vivid lightning heavy rain, no rain, etc.) SMALL HAIL REPORTED IN BOTHWELL BUT NOT ALONG THE TORNADO TRACK

10. TOTAL DAMAGE ESTIMATE \$ M 11. TOTAL DEATHS NONE

12. TOTAL INJURED NONE 13. TOTAL HOMELESS NONE

14. LIST ALL REFERENCES THE CHATHAM DAILY NEWS, MARCH 31, 1981
TORNADO SURVEY, APRIL 7, 1981, M.J. NEWARK
WINDSOR STAR, APRIL 1, 1981.

15. SUMMARIZE REMARKS PERTAINING TO (a) FUNNEL; (b) INTERESTING OR CAPRICIOUS EVENTS.

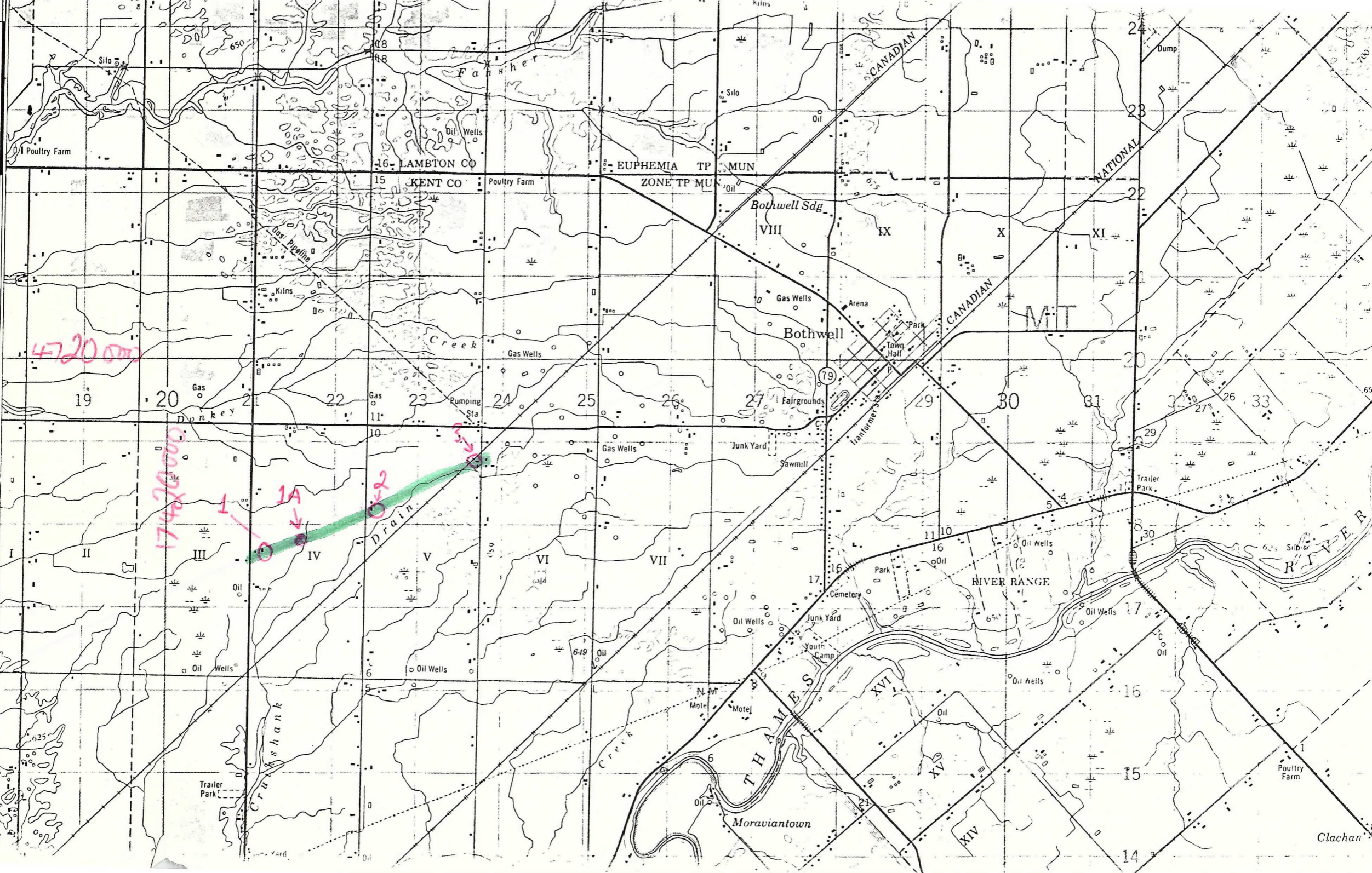
(a) Several eyewitness in Bothwell reported a funnel shaped cloud in the sky.

(b) Barns and farm outbuildings unroofed. Farm equipment overturned. Trees uprooted or broken off. A disturbed track visible through corn stubble.

Florence 2 km

40
23
22
21
20
19
18
17
16
15
35

24
23
22
21
20
19
18
17
16
15
14



4720 000

17420 000

Drain

I

II

III

IV

V

VI

VII

1A

2

3

Moraviantown

THAMES

RIVER RANGE

RIVER

LAMBTON CO

EUPHEMIA TP

KENT CO

ZONE TP MU

Bothwell Sdg

VIII

IX

X

XI

Bothwell

19

30

MIT

Trailer Park

Trailer Park

Poultry Farm

Clachan

0698102 1 9810407 M J N N 9810330 1300075 38A174211604717680 300247 101 2750

0698102 2 42C 18 5C 0 0 Y005

1 0698102 3 PHEN 34

0698102 4 INFO 36

0698102 5 INFO (CONT'D).

5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80

0698102 2 LEER 19 AXDA 20 AXER 21 AVDA 22 AVER 23 SADA 24 SAER 25 DEAD 26 HURT 27 PRDA 29 Y005

2 0698102 3 PHEN 34

0698102 4 INFO 36

0698102 5 INFO (CONT'D).

1 LOCATION VENTY BOTHWELL, ONT
REFERENCES

2 LOCATION
REFERENCES

CHATHAM DAILY NEWS, MARCH 31, 1981
TORNADO SURVEY, APR 7, 1981 M. J. N. Newark

WORKSHEET

IDTO 0698102

① ORIGIN x 17421160
 y 4717680

30 C
 ⑤ Standard Error S_x

② LIFT-OFF x_1 17423700
 y_1 4718760

30 C
 ⑥ Standard Error S_y

③ $(x_1 - x) = 2540$

④ $(y - y_1) = 1080$

⑦ DAMAGE LENGTH

$$L = [(x_1 - x)^2 + (y - y_1)^2]^{1/2}$$

③+④ $\rightarrow r, \theta = 2760$

⑧ $\alpha = \tan^{-1} \frac{|y - y_1|}{|x - x_1|}$

$x \leftrightarrow y = 23^\circ$

⑨ Standard Error $S_L = (S_x^2 + S_y^2)^{1/2}$

⑤+⑥ $\rightarrow r, \theta = 42.m C$

⑩ $\beta = \frac{\tan^{-1} S_L}{L}$

⑦+⑨ $\rightarrow r, \theta$
 $x \leftrightarrow y = 0.9^\circ$

NE quad $\phi = 90 - \alpha$

SE quad $\phi = 90 + \alpha$





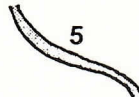
NW quad $\phi = 270 + \alpha$

SW quad $\phi = 270 - \alpha$

⑪ $\phi = 247^\circ$

TORNADO SURVEY FORM

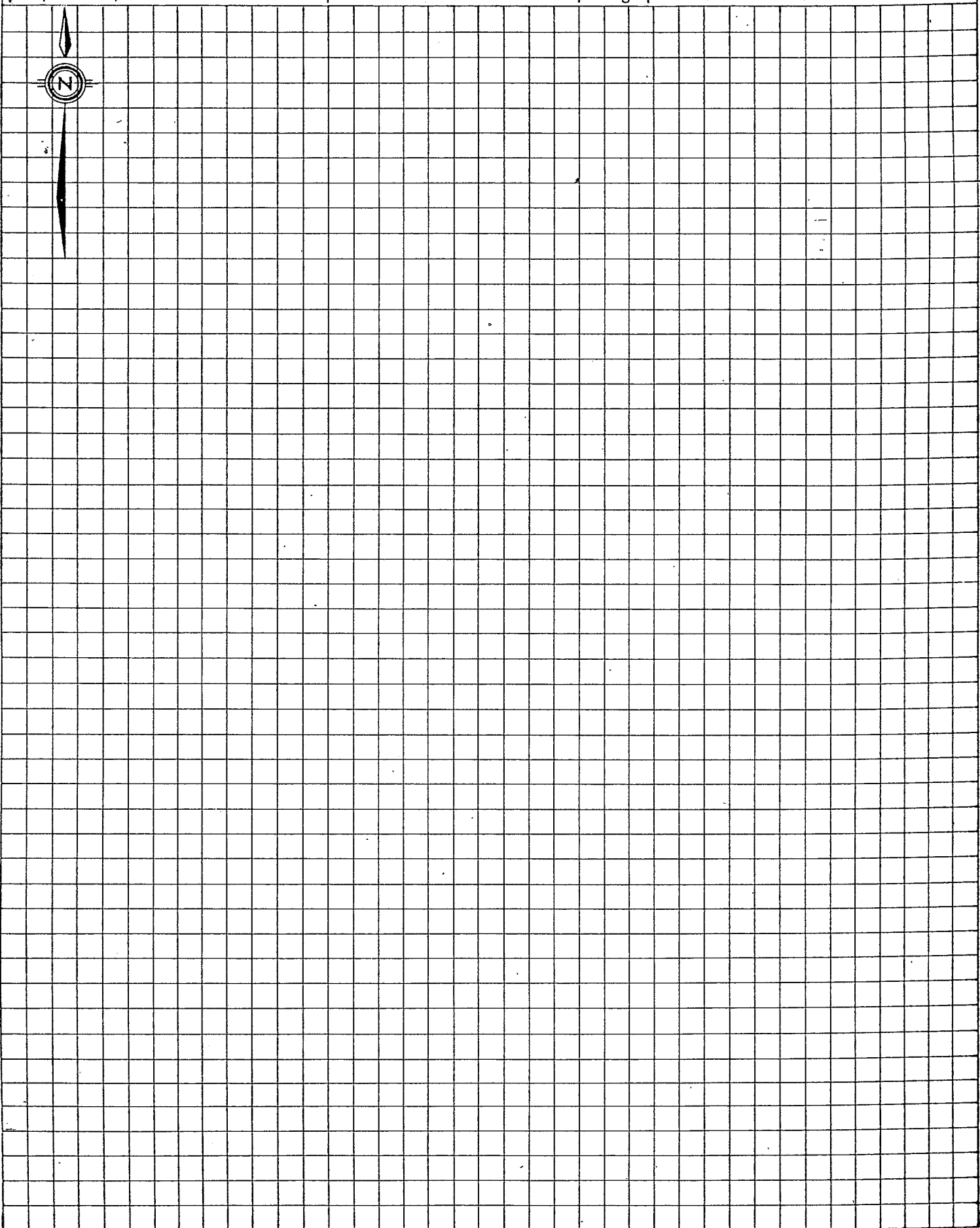
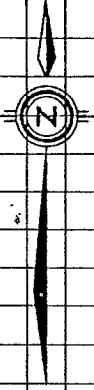
NAME OF INVESTIGATOR M. J. NEWARK		DATE OF INVESTIGATION APR 7, 1981	LOCATION NUMBER (1)
PERSONAL SURVEY <input type="checkbox"/>	TELEPHONE INTERVIEW <input checked="" type="checkbox"/>	UTM ZONE 17	EASTING 421160
		NORTHING 4717680	

1.	NAME(S) OF PERSON(S) INTERVIEWED GEORGE CASE
2.	ADDRESS (NOT RR#) OF THIS LOCATION LOT 8 CONC 4 ZONE TOWNSHIP <small>Lot Con. Twp. Co. or # Street, Town, Prov. or Section, Range, Township, Meridian</small>
3.	PHONE NUMBER OF PERSON INTERVIEWED (519) 692-4551 <small>Area Code Number</small>
4.	(a) TIME AND DATE OF THE EVENT AT THIS LOCATION 1300 EST MON MAR 30, 1981 <small>Standard Time, Time Zone Day Month Year</small>
	(b) HOW WAS THE TIME DETERMINED (STOPPED CLOCK, POWER FAILURE, MEMORY, A TIME-FIXING EVENT ETC.) FROM MEMORY
5.	(a) FUNNEL SEEN Y or N (N circled)
	(b) FUNNEL TYPE (CIRCLE)
	<div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  1 Multiple </div> <div style="text-align: center;">  2 Smoke-like </div> <div style="text-align: center;">  3 Columnar </div> <div style="text-align: center;">  4 Cone </div> <div style="text-align: center;">  5 Rope-like </div> <div style="text-align: center;"> 6 Unknown </div> <div style="text-align: center;"> 7 Other </div> </div>
	(c) IF MULTIPLE, HOW MANY? (d) FROM WHICH DIRECTION?
6.	UNUSUAL NOISE? Y or N (N circled) IF YES, DESCRIBE
7.	UNUSUAL SKY COLOUR? Y or N IF YES, DESCRIBE
8.	(a) HAIL? Y or N (N circled)
	(b) DID HAIL PRECEDE <input type="checkbox"/> AND/OR FOLLOW <input type="checkbox"/> THE TORNADO?
	(c) HAIL SIZE (CIRCLE) <div style="display: flex; justify-content: space-around;"> PEA GRAPE WALNUT GOLF BALL </div> <div style="display: flex; justify-content: space-around;"> TENNIS BALL OTHER UNKNOWN OR DIAMETER (mm) </div>
9.	(a) RAIN, HOW MUCH? YES
	(b) DID THE RAIN FALL BEFORE <input type="checkbox"/> AND/OR AFTER <input type="checkbox"/> THE TORNADO, AT THE TIME OF <input checked="" type="checkbox"/> NONE <input type="checkbox"/>
10.	(a) NUMBER OF HUMAN FATALITIES NONE
	(b) NUMBER OF ANIMAL FATALITIES NONE
	(c) NUMBER OF HUMAN INJURIES NONE
	(d) NUMBER OF ANIMAL INJURIES NONE

11.	<p>DAMAGE UNDERLINE ITEMS AS APPROPRIATE, AND ADD INFORMATION AS APPROPRIATE.</p>				
	<p>F0 (64 - 115 km/h) T.V. antennae bent. A few roof shingles removed from houses and roofing stripped from barns. Patches of siding removed from houses, awnings or canopies damaged. Aluminum garden sheds moved or buckled and garden furniture blown around. Fences blown down. Trees broken or uprooted (intermittently in heavily treed bush lots). <i>MAPLE TREE (NOT IN LEAF) 1.2 M DIAMETER TWISTED OFF ITS STUMP</i></p>				
	<p>F1 (116 - 179 km/h) Large areas of roofing material stripped from homes or industrial buildings. Barn roofs entirely removed and boards or siding removed from barn walls. Some impact damage from flying missiles. Unanchored buildings twisted on their foundations. Steel hydro-electric transmission towers knocked down. Summer cottages moved off their foundation.</p>				
	<p>F2 (180 - 251 km/h) Structural failure of roofs and porches. Barns demolished to the foundation. Empty stave concrete silos blown over or the upper portions of partly filled stave silos demolished. Unanchored 1 - storey houses moved entirely off their foundation. Cottages rolled over or carried short distances. Farm wagons or equipment carried short distances. Areas of total damage in heavily treed bush lots. Considerable impact damage from flying missiles.</p>				
	<p>F3 (252 - 330 km/h) Upper storeys of brick houses destroyed. Extensive structural damage to frame houses. Heavy farm machinery and automobiles moved or upset. Unanchored 2 - storey frame houses moved entirely off their foundation. Tombstones blown over or carried short distances. House trailers entirely demolished. Extensive impact damage from flying missiles.</p>				
	<p>F4 (331 - 416 km/h) Two-storey brick homes almost completely destroyed. Empty poured concrete silos blown down. Automobiles, vans, heavy farm equipment carried long distances through the air. Extensive structural failure of industrial buildings.</p>				
	<p>F5 (417 - 509 km/h) Little remains intact.</p>				
12.	<p>DAMAGE SPECIFICS REQUIRED (SHOW THE UNITS OF MEASUREMENT) IN ORDER TO CALCULATE WIND VELOCITY WHEN STRUCTURES OR OBJECTS HAVE BEEN MOVED, TIPPED OR CARRIED.</p>				
	<p>(a) Name of object or structure</p>				
	<p>(b) Predominant material used in its construction</p>				
	<p>(c) Was it anchored, and how?</p>				
	<p>(d) Estimated weight</p>				
	<p>(e) Dimensions</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Length (L)</td> <td style="width: 50%;">Width (W)</td> </tr> <tr> <td>Height (H)</td> <td>Diameter (D)</td> </tr> </table>	Length (L)	Width (W)	Height (H)	Diameter (D)
Length (L)	Width (W)				
Height (H)	Diameter (D)				
	<p>(f) Angle (θ) between the wind direction and the normal plane.</p>				
	<p>(g) Sketch of the object or structure (show L, W, H, D or other dimensions or quantities).</p>				
13.	<p>(a) ARE PHOTOS AVAILABLE (TAKEN EITHER BY PERSON INTERVIEWED OR ACQUAINTANCES)? Y or N</p>				
	<p>(b) IF YES, GIVE NAMES AND ADDRESSES WHERE THEY ARE AVAILABLE.</p>				

14.

Damage sketch for this location. — Need not be to scale but should indicate numerical dimensions (metric units preferred) and orientation with respect to north. Positions where photographs were taken should be located.



15.

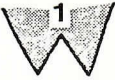



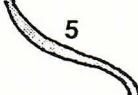
General comments

The roof was torn off the east side of the barn and thrown onto a loader.

A maple tree (12 m diameter) in the bush to the east of the barn was twisted off its stump (at location 1A on the map)

TORNADO SURVEY FORM

NAME OF INVESTIGATOR M. J. NEWARK		DATE OF INVESTIGATION	LOCATION NUMBER (2)
PERSONAL SURVEY <input type="checkbox"/>	TELEPHONE INTERVIEW <input checked="" type="checkbox"/>	UTM ZONE 17	EASTING 422450
		NORTHING 4718170	

1.	NAME(S) OF PERSON(S) INTERVIEWED FRED OLIVER		
2.	ADDRESS (NOT RR#) OF THIS LOCATION SOUTH LOT 9 CONC 5 ZONE TWP <small>Lot Con. Twp. Co. or # Street, Town, Prov. or Section, Range, Township, Meridian</small>		
3.	PHONE NUMBER OF PERSON INTERVIEWED (519) 695-5211 <small>Area Code Number</small>		
4.	(a) TIME AND DATE OF THE EVENT AT THIS LOCATION 1300 EST MON MAR 30, 1981 <small>Standard Time, Time Zone Day Month Year</small>		
	(b) HOW WAS THE TIME DETERMINED (STOPPED CLOCK, POWER FAILURE, MEMORY, A TIME-FIXING EVENT ETC.) HYDRO STOPPED		
5.	(a) FUNNEL SEEN Y or N		
	(b) FUNNEL TYPE (CIRCLE)		
	 1 Multiple	 2 Smoke-like	 3 Columnar
	 4 Cone	 5 Rope-like	6 Unknown
	7 Other		
	(c) IF MULTIPLE, HOW MANY?	(d) FROM WHICH DIRECTION?	
6.	UNUSUAL NOISE? Y or N IF YES, DESCRIBE		
7.	UNUSUAL SKY COLOUR? Y or N IF YES, DESCRIBE		
8.	(a) HAIL? Y or N	(b) DID HAIL PRECEDE <input type="checkbox"/> AND/OR FOLLOW <input type="checkbox"/> THE TORNADO?	
	(c) HAIL SIZE (CIRCLE)		
	PEA	GRAPE	WALNUT
	TENNIS BALL	OTHER	GOLF BALL
	OR DIAMETER (mm)		
9.	(a) RAIN, HOW MUCH? A LITTLE	(b) DID THE RAIN FALL BEFORE <input checked="" type="checkbox"/> AND/OR AFTER <input type="checkbox"/> THE TORNADO, AT THE TIME OF <input type="checkbox"/> NONE <input type="checkbox"/>	
10.	(a) NUMBER OF HUMAN FATALITIES	(b) NUMBER OF ANIMAL FATALITIES	
	(c) NUMBER OF HUMAN INJURIES	(d) NUMBER OF ANIMAL INJURIES	

11.

DAMAGE UNDERLINE ITEMS AS APPROPRIATE, AND ADD INFORMATION AS APPROPRIATE.

- FO (64 - 115 km/h) T.V. antennae bent. A few roof shingles removed from houses and roofing stripped from barns. Patches of siding removed from houses, awnings or canopies damaged. Aluminum garden sheds moved or buckled and garden furniture blown around. Fences blown down. Trees broken or uprooted (intermittently in heavily treed bush lots).
- F1 (116 - 179 km/h) Large areas of roofing material stripped from homes or industrial buildings. Barn roofs entirely removed and boards or siding removed from barn walls. Some impact damage from flying missiles. Unanchored buildings twisted on their foundations. Steel hydro-electric transmission towers knocked down. Summer cottages moved off their foundation. **CORN PICKER AND GRAIN ELEVATOR OVERTURNED**
- F2 (180 - 251 km/h) Structural failure of roofs and porches. Barns demolished to the foundation. Empty stave concrete silos blown over or the upper portions of partly filled stave silos demolished. Unanchored 1 - storey houses moved entirely off their foundation. Cottages rolled over or carried short distances. Farm wagons or equipment carried short distances. Areas of total damage in heavily treed bush lots. Considerable impact damage from flying missiles.
- F3 (252 - 330 km/h) Upper storeys of brick houses destroyed. Extensive structural damage to frame houses. Heavy farm machinery and automobiles moved or upset. Unanchored 2 - storey frame houses moved entirely off their foundation. Tombstones blown over or carried short distances. House trailers entirely demolished. Extensive impact damage from flying missiles.
- F4 (331 - 416 km/h) Two-storey brick homes almost completely destroyed. Empty poured concrete silos blown down. Automobiles, vans, heavy farm equipment carried long distances through the air. Extensive structural failure of industrial buildings.
- F5 (417 - 509 km/h) Little remains intact.

12.

DAMAGE SPECIFICS REQUIRED (SHOW THE UNITS OF MEASUREMENT) IN ORDER TO CALCULATE WIND VELOCITY WHEN STRUCTURES OR OBJECTS HAVE BEEN MOVED, TIPPED OR CARRIED.

- (a) Name of object or structure
- (b) Predominant material used in its construction
- (c) Was it anchored, and how?
- (d) Estimated weight
- (e) Dimensions

Length (L)	Width (W)
Height (H)	Diameter (D)
- (f) Angle (θ) between the wind direction and the normal plane.
- (g) Sketch of the object or structure (show L, W, H, D or other dimensions or quantities).

13.

- (a) ARE PHOTOS AVAILABLE (TAKEN EITHER BY PERSON INTERVIEWED OR ACQUAINTANCES)?
Y or N
- (b) IF YES, GIVE NAMES AND ADDRESSES WHERE THEY ARE AVAILABLE.

14.

Damage sketch for this location. — Need not be to scale but should indicate numerical dimensions (metric units preferred) and orientation with respect to north. Positions where photographs were taken should be located.



No damage to buildings at this location, but a corn picker and a grain elevator (the heavier of two elevators located next to each other) were overturned. They were situated about 75 feet east of the undisturbed barn.

Right after the tornado, when he heard about his neighbour's damage, Mr Oliver checked his property and saw a path about 50 to 60 ft wide through the corn stubble of his field leading towards the Jones farm on the one side, and towards the Case farm on the other. He said that the light-coloured, weathered side of the plants (from ^{remains in the ground} the preceding season) had all been turned over in the swath, and the dark underside, newly exposed, clearly showed.

TORNADO SURVEY FORM

NAME OF INVESTIGATOR M. J. NEWARK		DATE OF INVESTIGATION APR 7, 1981	LOCATION NUMBER (3)
PERSONAL SURVEY <input type="checkbox"/>	TELEPHONE INTERVIEW <input checked="" type="checkbox"/>	UTM ZONE 17	EASTING 423700
		NORTHING 4718760	


1. NAME(S) OF PERSON(S) INTERVIEWED
MRS BEULAH JONES


2. ADDRESS (NOT RR#) OF THIS LOCATION
LOT 10 CONC 5 ZONE TWP
Lot Con. Twp. Co. or # Street, Town, Prov. or Section, Range, Township, Meridian


3. PHONE NUMBER OF PERSON INTERVIEWED
(519) 695-2024
Area Code Number


4. (a) TIME AND DATE OF THE EVENT AT THIS LOCATION
1300 EST MON MAR 30, 1981
Standard Time, Time Zone Day Month Year
- (b) HOW WAS THE TIME DETERMINED (STOPPED CLOCK, POWER FAILURE, MEMORY, A TIME-FIXING EVENT ETC.)
HYDRO WENT OFF WHEN DABRIS HIT LINK


5. (a) FUNNEL SEEN
Y or (N) **(BUT SEVERAL PEOPLE IN BOTHWELL SAW FUNNEL IN THE SKY, MRS JONES COULDN'T REMEMBER THEIR NAMES)**
- (b) FUNNEL TYPE (CIRCLE)


1
Multiple


2
Smoke-like


3
Columnar


4
Cone


5
Rope-like

6
Unknown

7
Other

- (c) IF MULTIPLE, HOW MANY? _____
- (d) FROM WHICH DIRECTION? _____

6. UNUSUAL NOISE? **(Y) or N** IF YES, DESCRIBE **GARNET JONES SEATED AT MEAL, JUMPED UP WHEN HE HEARD A ROARING NOISE**

7. UNUSUAL SKY COLOUR? **Y or N** IF YES, DESCRIBE _____

8. (a) HAIL? **Y or (N)**
- (b) DID HAIL PRECEDE AND/OR FOLLOW THE TORNADO?
- (c) HAIL SIZE (CIRCLE)

PEA
GRAPE
WALNUT
GOLF BALL

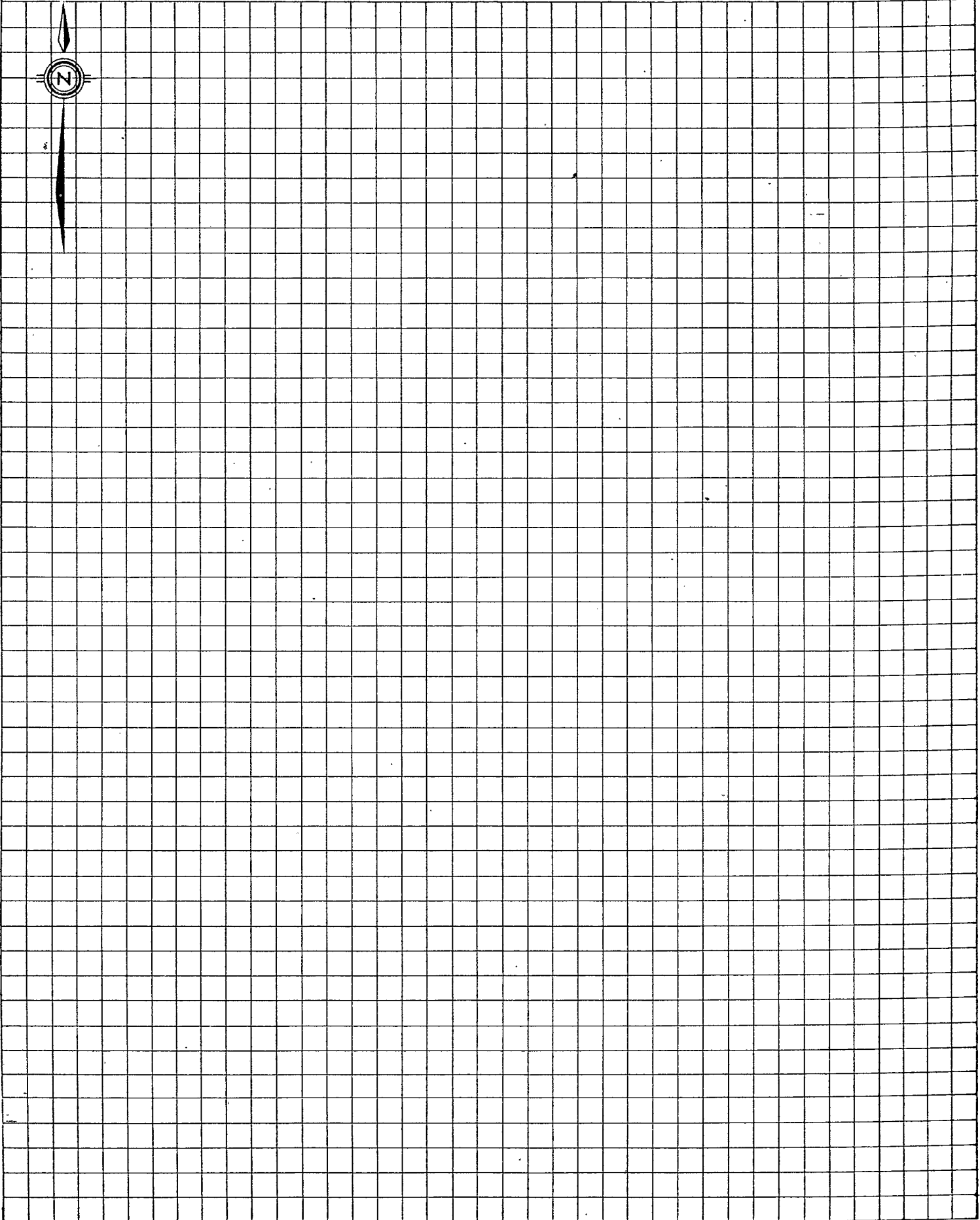
TENNIS BALL
OTHER
UNKNOWN
OR DIAMETER (mm)

9. (a) RAIN, HOW MUCH? _____
- (b) DID THE RAIN FALL BEFORE AND/OR AFTER THE TORNADO, AT THE TIME OF NONE

10. (a) NUMBER OF HUMAN FATALITIES
NONE
- (b) NUMBER OF ANIMAL FATALITIES
NONE
- (c) NUMBER OF HUMAN INJURIES
NONE
- (d) NUMBER OF ANIMAL INJURIES
NONE

11.	<p>DAMAGE UNDERLINE ITEMS AS APPROPRIATE, AND ADD INFORMATION AS APPROPRIATE.</p>				
	<p>F0 (64 - 115 km/h) T.V. antennae bent. A few roof shingles removed from houses and roofing stripped from barns. Patches of siding removed from houses, awnings or canopies damaged. Aluminum garden sheds moved or buckled and garden furniture blown around. Fences blown down. Trees broken or uprooted (intermittently in heavily treed bush lots).</p>				
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	<p>F2 (180 - 251 km/h) Structural failure of roofs and porches. Barns demolished to the foundation. Empty stave concrete silos blown over or the upper portions of partly filled stave silos demolished. Unanchored 1 - storey houses moved entirely off their foundation. Cottages rolled over or carried short distances. Farm wagons or equipment carried short distances. Areas of total damage in heavily treed bush lots. Considerable impact damage from flying missiles.</p>				
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	<p>F5 (417 - 509 km/h) Little remains intact.</p>				
12.	<p>DAMAGE SPECIFICS REQUIRED (SHOW THE UNITS OF MEASUREMENT) IN ORDER TO CALCULATE WIND VELOCITY WHEN STRUCTURES OR OBJECTS HAVE BEEN MOVED, TIPPED OR CARRIED.</p>				
	<p>(a) Name of object or structure</p>				
	<p>(b) Predominant material used in its construction</p>				
	<p>(c) Was it anchored, and how?</p>				
	<p>(d) Estimated weight</p>				
	<p>(e) Dimensions</p> <table border="0"> <tr> <td style="padding-left: 40px;">Length (L)</td> <td style="padding-left: 100px;">Width (W)</td> </tr> <tr> <td style="padding-left: 40px;">Height (H)</td> <td style="padding-left: 100px;">Diameter (D)</td> </tr> </table>	Length (L)	Width (W)	Height (H)	Diameter (D)
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	<p>(f) Angle (\emptyset) between the wind direction and the normal plane.</p>				
	<p>(g) Sketch of the object or structure (show L, W, H, D or other dimensions or quantities).</p>				
13.	<p>(a) ARE PHOTOS AVAILABLE (TAKEN EITHER BY PERSON INTERVIEWED OR ACQUAINTANCES)? Y or N</p>				
	<p>(b) IF YES, GIVE NAMES AND ADDRESSES WHERE THEY ARE AVAILABLE.</p>				

14. Damage sketch for this location. — Need not be to scale but should indicate numerical dimensions (metric units preferred) and orientation with respect to north. Positions where photographs were taken should be located.



Mr and Mrs Jones were in the house when the storm struck and didn't see it. However, Mr Jones was alarmed by the roar (note that well used rail line runs through their property and they are accustomed to the sound of trains). The storm was over in moments. Roofs were torn from outbuildings and their barn was twisted on its foundation. Mrs Jones said that the roof from their corn crib was carried eastwards, while 65 year old evergreen pines were uprooted towards the north, and the roof from a shed was also carried towards the north.

Although this sheeting was carried eastwards across the road into neighbour's laneway, there was no damage to the neighbour's property.

Mrs Jones said that minor roof damage occurred to a building on the road between the 3rd + 4th conc. She had also heard that two people in Bottwell had seen an unusual funnel shaped cloud in the sky.