DATE

SUBJECT





COLORFAST



0031 0 +3D 5EP87



3631 0 +3D SEF8T



0031 0 +30 SEP87



0031 0 +30 SEP97



0051 0 +30 SEP87



3631 0 +40 SEF87



0031 0 +4D SEP87



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0031 0 +40 SEP87



0031 0 +4D 5EF87



0031 0 +3D 3EF87



0071 0 +30 SEP87



3631 0 +3D SEP87

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ACTION REQUEST / FICHE DE SERVICE

To — À	File No. — Dossier N°
Mike Newark CCAI/I	
	Date 87.09.23

From — De
Al Wallace
WAEML

☐ Please call Prière d'appeler	Tel. No. — N° de tél. 468-7900	Ext. — Poste

☐ Returned your call Vous a rappelé	☐ Will call again Vous rappellera	☐ Wants to see you Désire vous voir

Date	Time — Heure	Message received by Message reçu par

☐ Action Donner suite	☐ Approval Approbation	☐ Note & return Noter et retourner
☐ Comments Commentaires	☐ Draft reply Projet de réponse	☐ Note & forward Noter et faire suivre
☐ As requested Comme demandé	☐ Signature	☐ Note & file Noter et classer

GC 12E

7540-21-868-3907

Government of Canada / Gouvernement du Canada

ACTION REQUEST / FICHE DE SERVICE

To — À: Mike

File No. — Dossier N°:

Date: Sept 17

From — De: Al Wallace

Please call / Prière d'appeler	Tel. No. — N° de tél.	Ext. — Poste
☐	403 468-7908	

☐ Returned your call / Vous a rappelé
☐ Will call again / Vous rappellera
☐ Wants to see you / Désire vous voir

Date	Time — Heure	Message received by / Message reçu par
Sept 17	10:10	Les

☐ Action / Donner suite
☐ Approval / Approbation
☐ Note & return / Noter et retourner
☐ Comments / Commentaires
☐ Draft reply / Projet de réponse
☐ Note & forward / Noter et faire suivre
☐ As requested / Comme demandé
☐ Signature
☐ Note & file / Noter et classer

Al wishes to discuss some aspects of tornado tracks.

15 00

F4 C.W.S.

Athabasca

Whitecourt

Nw.

Millet

(403) Edmonton Sun.

468-0281

Rob den Hartigh.

Alberta Transportation

(403) 427-8510

WEATHER SERVICES DIRECTORATE
CIRCULATION LIST NUMBER 3

I.D. Rutherford
S. Falla
~~S. McNair~~ ~~R. Lefébvre~~
G. Payment
~~D. Fraser~~
~~I. Fung-Fook~~
~~B. Smith~~
~~B. Wyer~~

Retention: 2 forward

Date: Lettre - Lettre	N° du dossier - File No.	N° de chemise - Docket No
87/09/16	8020-1	00020696

MURRAY DORIN
M.P.
EDMONTON WEST
ROOM 579, CONFEDERATION
OTTAWA, ONT.
K1A 0A6
Signataire - Sender

Environnement Canada
Library, Downsview
JUL 21 1994
Environnement Canada
Bibliothèque (Downsview)

OCT - 5 1987

Copie(s) additionnelle(s) à:
Additional copy(ies) to:

M.GRENIER
H.MARTEL

WAED - for the preparation of a response, please.
AWDG - for information.
Mat L

Cette lettre a été acheminée pour action à:
This letter has been sent for action to:

AES

SUITE À DONNER / ACTION

Rédiger réponse pour la signature du:
Prepare reply for signature of: [X]

Réponse co-ordonnée demandée
Responsable du texte définitif: [ ]

Coordinated reply required
Responsibility for final reply: [ ]

87 X 06

Nom
Name ▶ MARC GRENIER

Nom
Name ▶

(1) ~~AWDG~~ for info DMF
(2) AWDG files
8-10-87

Pour information / exécution
For information / necessary action [ ]

Répondre directement
Reply directly [ ]

Autre
Other [ ]

COMMENTAIRES / COMMENTS:

2 ● copies of BLACK FRIDAY being sent to WAED
1 copy to AWDG
1 retained in ADMA's office in Hull.

attached revised AES

DATE D'ÉCHÉANCE: DUE DATE:	*Si cette date n'est pas respectée une réponse provisoire doit être rédigée pour la signature du Chef de cabinet, expliquant les raisons pour le délai.*	*If this date cannot be met an interim reply is required for the Executive Assistant's signature, outlining the reason for the delay.*
87/10/19		

Les Terrasses de la Chaudière
25e étage / 25th floor
Hull, Québec K1A 0H3
(997-2820)

87/10/05

Point de contact à l'unité de la correspondance:
Contact Person in Correspondence Unit:

Nom - Name

R. TUNIS (953-3606)

Sous-ministre
Environnement Canada

Deputy Minister
Environment Canada

CONTRÔLE POUR CORRESPONDANCE
CORRESPONDENCE CONTROL

01-1024 (09-85)

vertical file -- tornado file

Government of Canada / Gouvernement du Canada

MEMORANDUM **NOTE DE SERVICE**

TO / À: Francois Quesnel
Chef
Division de la correspondance

FROM / DE: Marc Grenier
Adjoint exécutif au ministre

SECURITY - CLASSIFICATION - DE SÉCURITÉ
OUR FILE / NOTRE RÉFÉRENCE
YOUR FILE / VOTRE RÉFÉRENCE
DATE: le 30 septembre 1987

SUBJECT / OBJET: Correspondance de Murray Dorin, député

Veuillez vous assurer qu'une réponse soit préparée pour ma signature à la correspondance citée en rubrique.

Marc

Marc Grenier

c.c. Yvon Bernier, SAE

HOUSE OF COMMONS
CHAMBRE DES COMMUNES

MURRAY DORIN, M.P.
EDMONTON WEST

150 CONFEDERATION BLDG
HOUSE OF COMMONS
OTTAWA ONTARIO
K1A 0A6
(613) 996-4758

16118 STONY PLAIN ROAD
EDMONTON, ALBERTA
T5P 4A2
(403) 484-5599

Ottawa, Ontario
September 16, 1987

020693

Mr. Marc Grenier
Assistant to the Hon. T. McMillan, PC, MP
28th Floor
Terrasses de la Chaudière
Hull, Quebec

8020-1

OCT - 8 19

Dear Mr. Grenier:

I have recently received copies of the publication Black Friday which outlines in picture form the horrors of the Edmonton tornado.

Please find several copies of the publication enclosed. I would ask that you circulate some of them to the representatives of your Department who are proceeding with the study of the tornado.

Thanking you for your kind attention, I am

Murray Dorin, M.P.
Edmonton West

Enclosures

AUG 21 1987

Government of Canada / Gouvernement du Canada

MEMORANDUM **NOTE DE SERVICE**

TO / À: DISTRIBUTION

FROM / DE: WAED

SECURITY - CLASSIFICATION - DE SÉCURITÉ
OUR FILE/NOTRE RÉFÉRENCE: 8960-1 (WAEML)
YOUR FILE/VOTRE RÉFÉRENCE:
DATE: August 14, 1987

SUBJECT / OBJET: Edmonton Tornado

1. I am pleased to provide you with a copy of the preliminary study of the tornado that struck Edmonton on July 31, 1987.

2. This study deals primarily with the physical aspects of the tornado including its damage path. An aerial survey, ground surveys and eyewitness reports were used to compile the study. As more data is received, adjustments and refinements may be made.

3. An overall review of our weather warning system will be undertaken over the next few months in cooperation with the City of Edmonton, the province and other emergency planning groups to see if any improvements can be achieved. We would be pleased to send you a copy of this review upon its completion.

B.J. O'Donnell
Regional Director
Western Region
Atmospheric Environment Service
Environment Canada

Attachment

Distribution:

ADMA G.R. Kerr, Dir., CW, C&P, Edmonton
AWDG R.A. Halliday, Dir., IWL, C&P, Regina
APDG S. Kun, RD, Parks, Calgary
ACDG D. Harper, RD, Parks, Winnipeg
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Western Region Technical Notes

TRACK OF THE EDMONTON TORNADO

FRIDAY, JULY 31, 1987

PRELIMINARY REPORT

by

Al Wallace

Summer Severe Weather Supervisor
Alberta Weather Centre
August 11, 1987

Environment Canada / Environnement Canada
Atmospheric Environment Service / Service de l'environnement atmosphérique

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TRACK OF THE EDMONTON TORNADO: JULY 31, 1987

PRELIMINARY REPORT

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A noter: Le Centre météorologique de l'Alberta, voulant transmettre le plus tôt possible les informations relatives à la tornade du 31 juillet 1987, se voit dans l'impossibilité de fournir une traduction française de ce rapport dans l'immédiat. La copie française sera disponible incessamment.

1. Introduction

On July 31, 1987 a devastating tornado struck the City of Edmonton and surrounding communities. Heaviest damage occurred in the eastern sections of the city, with the Evergreen Trailer Park, eastern industrial area and the residential areas of Millwoods and Clareview suffering the most severe destruction. The tornado caused 27 deaths, hundreds of injuries and property damage over $250 million.

This report has been prepared using information gathered in the week following the tornado. The findings should be viewed as preliminary and are subject to adjustments and refinements as more information becomes available.

This preliminary report describes the weather conditions that generated the storm, describes the physical dimensions of the tornado, and outlines the watches and warnings issued by Environment Canada.

The City of Edmonton, Environment Canada, and other agencies concerned with public safety will be coordinating a more in-depth review of all matters related to the July 31, tornado.

2. Alberta Tornado Climatology

During the period between 1960 and 1982 there was an annual average of 8.3 tornado sightings in Alberta. In the years 1983 through 1986, the number of sightings of tornadoes in Alberta were 17, 12, 15 and 21 respectively. The increase in the numbers of tornado sightings in recent years is believed to stem from a greater awareness of the public and the enhanced reporting network brought about by the recruitment of volunteer weather watchers. In the period 1889 - 1986 there have been seven other documented cases of tornadoes in Edmonton City but these touchdowns were brief and intermittent. (Hage, 1982).

Alberta's tornadoes are of varying intensities. Tornadoes are classified using the Fujita Tornado Intensity Scale (Table 1). Recent major tornadoes to strike Alberta were: Athabasca, June 29, 1984; Lloydminster, July 8, 1983; and, Rocky Mountain House, June 30, 1982.

3. Meteorological Conditions

The last 10 days of July had been hot with temperatures at or near record values. Humidities had been increasing with dewpoints, a measure of humidity, reaching near 20 degrees (10 degrees above normal). Thunderstorms had been frequent during this period, and had necessitated the issuance of a number of severe weather watches and warnings. Damaging winds, large hail, heavy downpours and record lightning activity were associated with the thunderstorms. On Thursday July 30, 2 lines of severe thunderstorms had crossed the Edmonton region accompanied by damaging winds.

Friday July 31 dawned sunny, and although surface temperatures and humidities were lower than the previous days the airmass continued to have the potential for strong thunderstorms. The circulation maintained a southerly flow of warm, moist air. As the day progressed, surface temperatures and dewpoints rose. Thunderstorms began developing in the late morning along the Rocky Mountain Foothills and by early afternoon were moving northward across central Alberta. A cold front was sweeping eastward across Alberta providing an additional lift mechanism for the formation of severe thunderstorms. A line of thunderstorms southwest of Edmonton intensified rapidly and moved toward the city at about 70 kmh. A new thunderstorm cell developed explosively ahead of the line, in the Leduc area, and moved northward. This would prove to be the storm that produced the tornado. The line overtook the cell and together they moved northward through eastern Edmonton. In addition to the tornado, hail as large as softballs, strong winds and rain amounts of 40 - 50 millimetres were reported in the city. Approximately 2 hours after the first thunderstorms a second line moved through the city, again producing heavy rain, hail and damaging winds (greater than 110 kmh).

4. Weather Forecasts and Warnings

The public forecast issued at 5:00 A.M. for the Edmonton region predicted an 80% probability of thunderstorms noting that they would be heavy at times. At 11:00 A.M. the public forecast stated the thunderstorms would produce hail, damaging winds and heavy downpours.

Central and southern Alberta had been identified as the area having the highest potential for severe thunderstorms. A Severe Weather Watch was issued for Calgary and Red Deer regions when thunderstorms began developing along the Foothills. At 1:40 P.M., as the line moved away from the Foothills and headed toward Edmonton, another Watch was issued for the Edmonton Region. Continued intensification of the storm cells lead to a Severe Weather Warning being issued at 2:45 P.M. for the City of Edmonton and the counties to the south and west. A special alert tone was sounded at 2:52 P.M. on Weatheradio Canada operated by Environment Canada at which time the Warning was broadcast.

The first report of a tornado was received at 2:59 P.M. At 3:04 P.M., the Weatheradio alert tone was again sounded and the Tornado Warning was broadcast. A Tornado Warning was issued to the wire services at 3:07 P.M. for the City of Edmonton and the counties of Strathcona and Leduc. At 3:30 P.M., the Tornado Warning was updated and extended to counties to the east and north of Edmonton. At 4:55 P.M., the Tornado Warning was again updated as the second line of severe thunderstorms approached the city. By 7:00 P.M., the risk of severe thunderstorms for the Edmonton area was over and the Tornado Warning, Severe Weather Watch and Severe Weather Warning were ended.

5. The Tornado

The information on the physical aspects of the tornado is based on a synthesis of eyewitness reports, ground surveys and an aerial survey by Brian Smith of the University of Chicago. Adjustments may be made to the conclusions regarding timing and damage path as more information is received.

A tornado was sighted near Leduc at 2:55 P.M. by a member of the public when a funnel cloud was seen to touch down and then retract. According to eyewitness accounts, the tornado reformed southeast of Beaumont at 3:01 P.M. The tornado then followed a generally northward track moving to the east of Beaumont, across the eastern fringes of Millwoods, northward to the Sherwood Park Industrial Estates, then to the North Saskatchewan River Valley. It followed the river northward, exiting the valley where it curves eastwards. The tornado crossed the northeastern fringes of Clareview. As it crossed 153rd Avenue it moved northeast to the Evergreen Trailer Park, then continued northeastward for about 5 km before dissipating.

The tornado was on the ground for over an hour, from its touchdown at 3:01 P.M., to its dissipation northeast of the Trailer Park just after 4:05 P.M. (Table 2). Based on the damage surveys, there was only one tornadic event with a path length of approximately 40 km and an average speed of near 35 kmh. The damage path varied in width from less than 100 metres (m) to over 1000 m. In the most severely damaged areas, the width of the severe destruction varied from 200 m (Evergreen Trailer Park) to about 700 m (industrial sections).

Surveys of the damage led to this tornado being tentatively classified as a strong F3 on the Fujita Tornado Intensity Scale (Table 1). Along the path of the tornado (Map 1) varying scales of damage were visible, ranging from F0 to occasionally approaching F4. Occurrences of missile damage were evident in many areas.

Beaumont Area - Ellerslie Road: 1455 - 1515 hours (hrs) MDT (Map 2)

Little damage was visible at the funnel's first contact with the ground. After the tornado set down again, about 3 km southeast of Beaumont, only minor damage was visible. As it moved northward and strengthened F1-F2 damage was apparent 2 km south-southeast of Beaumont although the path width was narrow (less than 100 m). About 1.5 km southeast of Beaumont damage was more severe (F2-F3) with the destruction of several farm buildings. The tornado appeared to weaken as it continued northeastward then gain strength as it hit the Hilltop Dairy Farm (about 2.5 km northeast of Beaumont) at about F2-F3. Extensive roof damage to 3 new homes east of 34 St. 1.3 km south of Ellerslie Rd indicates F2 strength. As the tornado crossed Ellerslie Rd it appeared to maintain F2 strength.

Millwoods: 1515 - 1525 hrs MDT. (Map 3)

As the tornado moved into southeast Millwoods, its damage path was 750 - 1000 m wide with the most significant damage about 500 m wide. As the tornado moved north, transmission towers were toppled and tree damage was evident (F2). The damage path crossed west of 34 St. at 19 Ave. Homes along the east side of 35 St. between 20 and 22 Ave. were damaged consistent with an F2 tornado. The main damage track then veered east of 34 St. to the north of 23 Ave and continued northward. The tornado appeared to weaken to F1 as it passed northeastern Millwoods.

Industrial Area: 1525 - 1540 hrs MDT. (North of Whitemud Freeway to the River Valley, between 34 St. and 17 St. - Map 4)

After the tornado crossed the Whitemud Freeway, it gained strength to the F3 level approaching the F4 level. Damage was extensive and devastating within an area 600 - 700 m wide, from west of the CNR tracks to about 24 St. Moderate damage extended to about 1000 m wide. Within the more severely damaged zone of 600 - 700 m, buildings were totally destroyed, cars and trucks were picked-up and moved considerable distances or suffered

severe damage, steel girders were twisted, and train cars were derailed. As the tornado moved across the CNR tracks east of the Imperial Oil Refinery it weakened to F2 and was likely F1 or less as it moved into the river valley near the Strathcona Science Park.

Clareview: 1540 - 1555 hrs MDT. (Map 5)

The tornado then paralleled the river valley at F0-F1 strength causing moderate tree damage. The tornado followed the river valley east of Clareview. Roof damage was evident east of 24 St. between 120 Ave. and 137 Ave., tree damage and some structural damage was evident in Hermitage Park and a drive-in theatre was destroyed near 24 St/137 Ave. (F1-F2). The greatest devastation occurred along 19 St. between 145 and 147 Ave. where 3 houses (2 - storey) were completely demolished and many others had considerable damage. At this point the tornado was F3 approaching F4. Just to the east of the destroyed houses, 4 large steel hydro towers were twisted and knocked down. To the west (21 St.) F1 roof damage was evident. The general damage width was again up to 1 km wide, while severe damage was limited to about 300 m. The tornado moved northeast from Clareview around 19 St/153 Ave. and weakened rapidly. Only minor tree damaged (F0) was apparent.

Evergreen Trailer Park: 1555 - 1605 hrs MDT. (Maps 6 and 7)

About 500 m southwest of the Evergreen Trailer Park the tornado once more strengthened (F2-F3) as it struck 3 farms destroying a mobile home and causing extensive severe damage to buildings, vehicles and trees. The tornado then devastated the trailer park destroying 133 mobile homes and considerably damaging another 39. Frequent missile damage was observed. The path of total destruction was about 200 m wide during this F3 stage. The tornado left the eastern end of the trailer park about 300 m north of the 1 St/167 Ave. intersection. As it continued northeastward, rapid weakening occurred (F0-F1) and the tornado finally dissipated about 5 km northeast of the trailer park.

6. Other Severe Weather Phenomena

Very large hail, up to softball size, was reported in south Edmonton and the eastern sections of Edmonton south of the River. Torrential rains accompanied the storm complex across all parts of the City and produced local flooding. Strong and gusty winds together with downbursts from the thunderstorm also caused some damage near to, but not within, the tornado path.

A second line of thunderstorms moved across the city in the early evening. This was accompanied by strong wind gusts (110 kmh reported) and hail.

7. Summary

Tornadoes occur every year in Alberta. The tornado that devastated portions of eastern Edmonton on July 31, 1987 was however a rare event.

Surveys of the damage led to this tornado being tentatively classified as a strong F3 on the Fujita Tornado Intensity Scale. Along the path of the tornado varying scales of damage were visible, ranging from F0 to occasionally as high as F4.

The damage path extended from southeast of Beaumont to northeastern Edmonton over a length of nearly 40 kms. Damage over half of the path indicates a tornado of intensity F2 or stronger. The width of severe destruction varied from 200 m to as much as 700 m.

Continued investigations of this tornado and comparisons with other tornadic events in Canadian history, will further define the magnitude of this event.

8. Reference

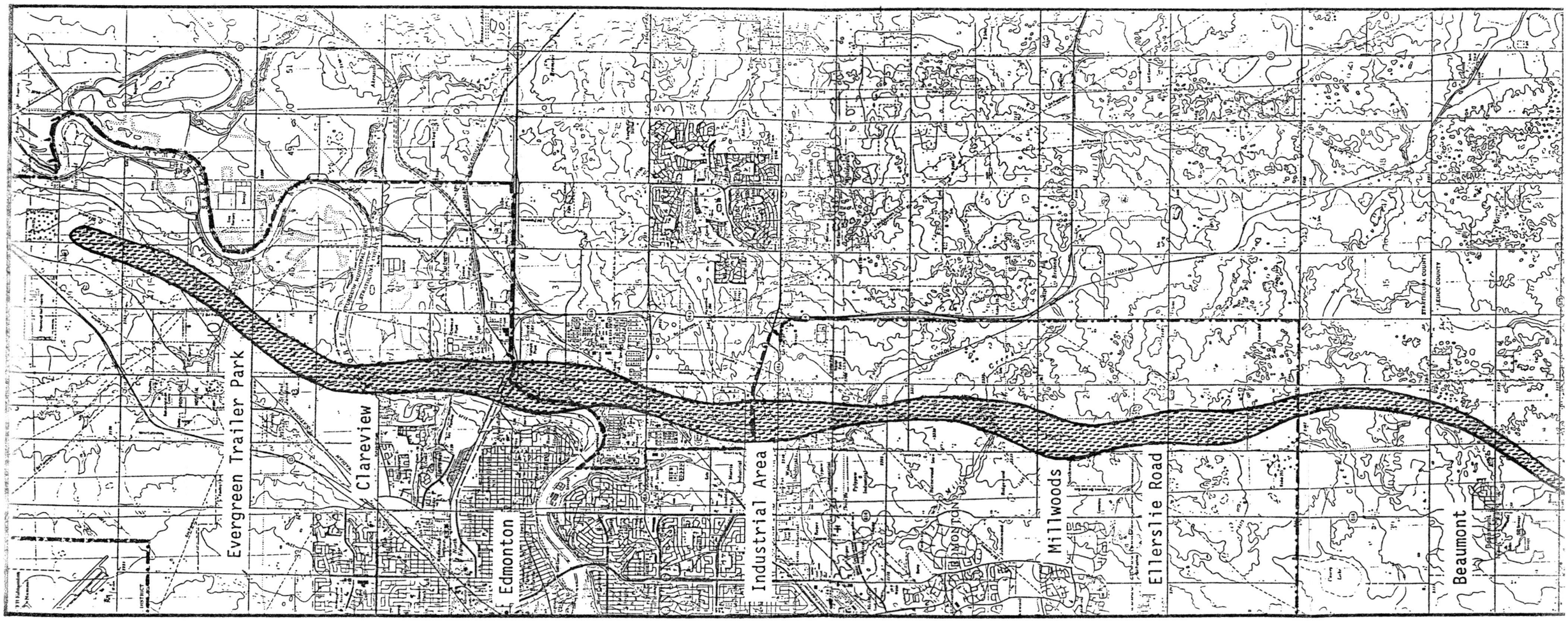
1. Hage, K.D., 1982, Preliminary List of Tornadoes in Alberta 1960 - 1982, Unpublished manuscript.

Table 1. The Fujita Tornado Intensity Scale.

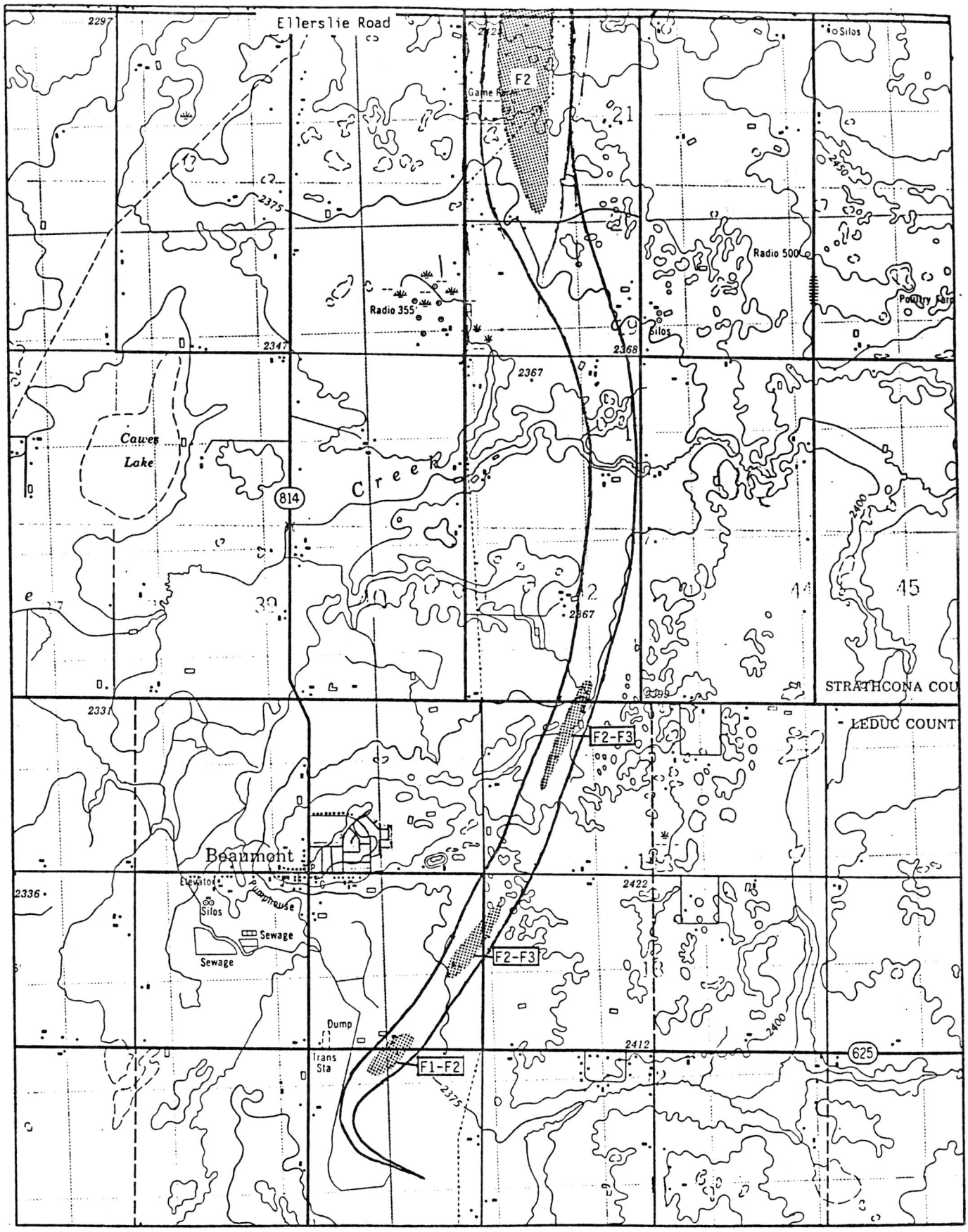
	Surface Wind Speed (km/h)	Expected Damage
F0	64 - 116	Light
F1	117 - 180	Moderate
F2	181 - 252	Considerable
F3	253 - 330	Severe
F4	331 - 417	Devastating
F5	418 - 509	Incredible

Table 2. Tornado Chronology. Based on eyewitness accounts. Times are best estimates available.

Time (hrs/MDT)	Location
1455	First known touchdown in the vicinity of Leduc.
1501	Beginning of the 40 km track, 3-4 km southeast of Beaumont.
1507	1-2 km northeast of Beaumont.
1515	Crossed Ellerslie Road between 34 St. and 17 St.
1520	Moved through southeastern Millwoods.
1530	Northeast of Millwoods.
1535	Moving through Sherwood Park Industrial area.
1540	Moving into the River Valley near the Strathcona Science Park.
1550	Moving through eastern Clareview.
1553	Farms just southwest of Trailer Park hit.
1555	Moving into Evergreen Trailer Park.
1605	Dissipates 5 km northeast of Trailer Park.



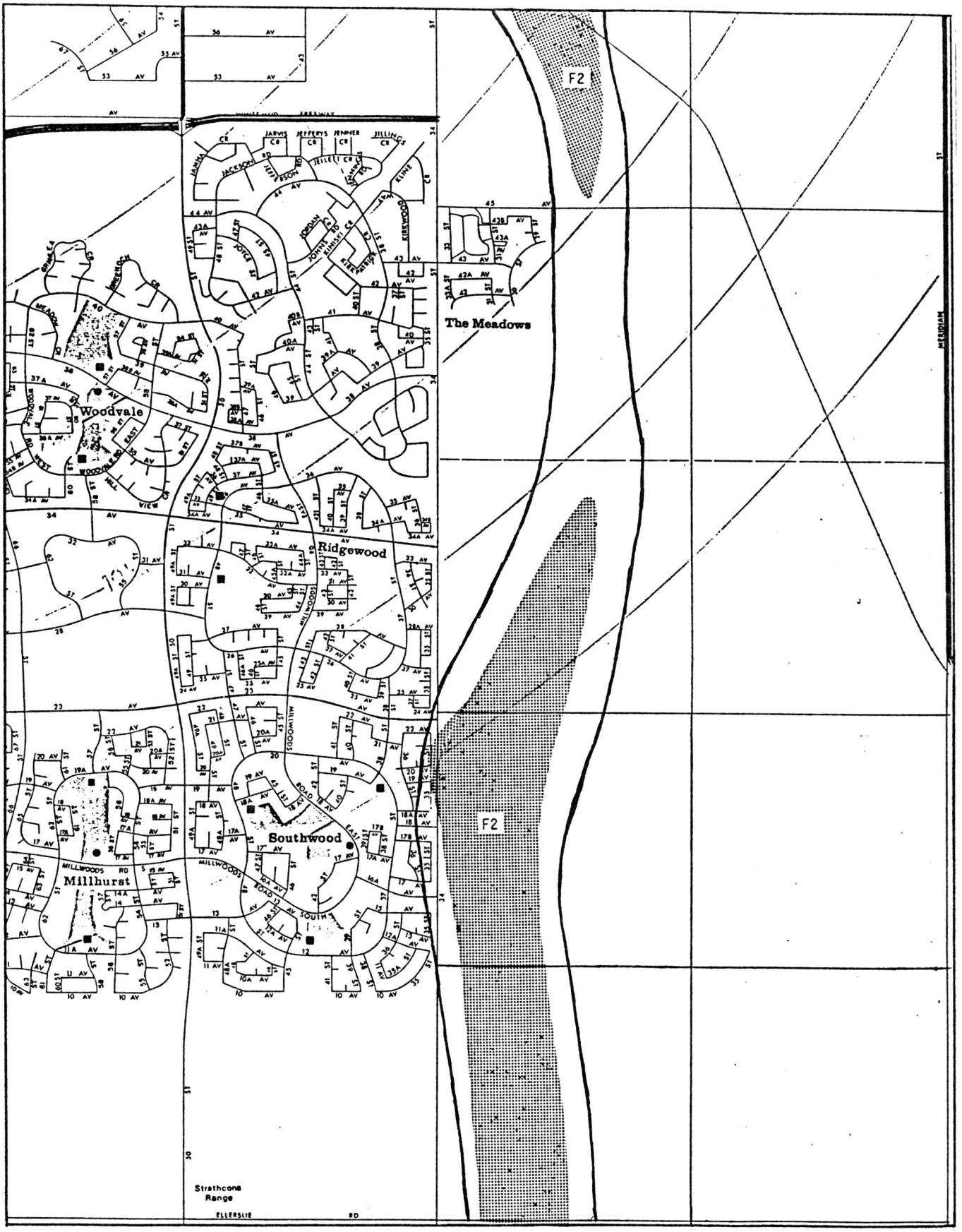
Map 1. Tornado Damage Path, Edmonton Tornado July 31, 1987.
Based on aerial and ground surveys.



Map 2. Beaumont Area - Ellerslie Road.
Tornado Damage Path, July 31 1987.
Based on aerial and ground surveys.

Considerable or greater Damage

General Damage F0 - F1

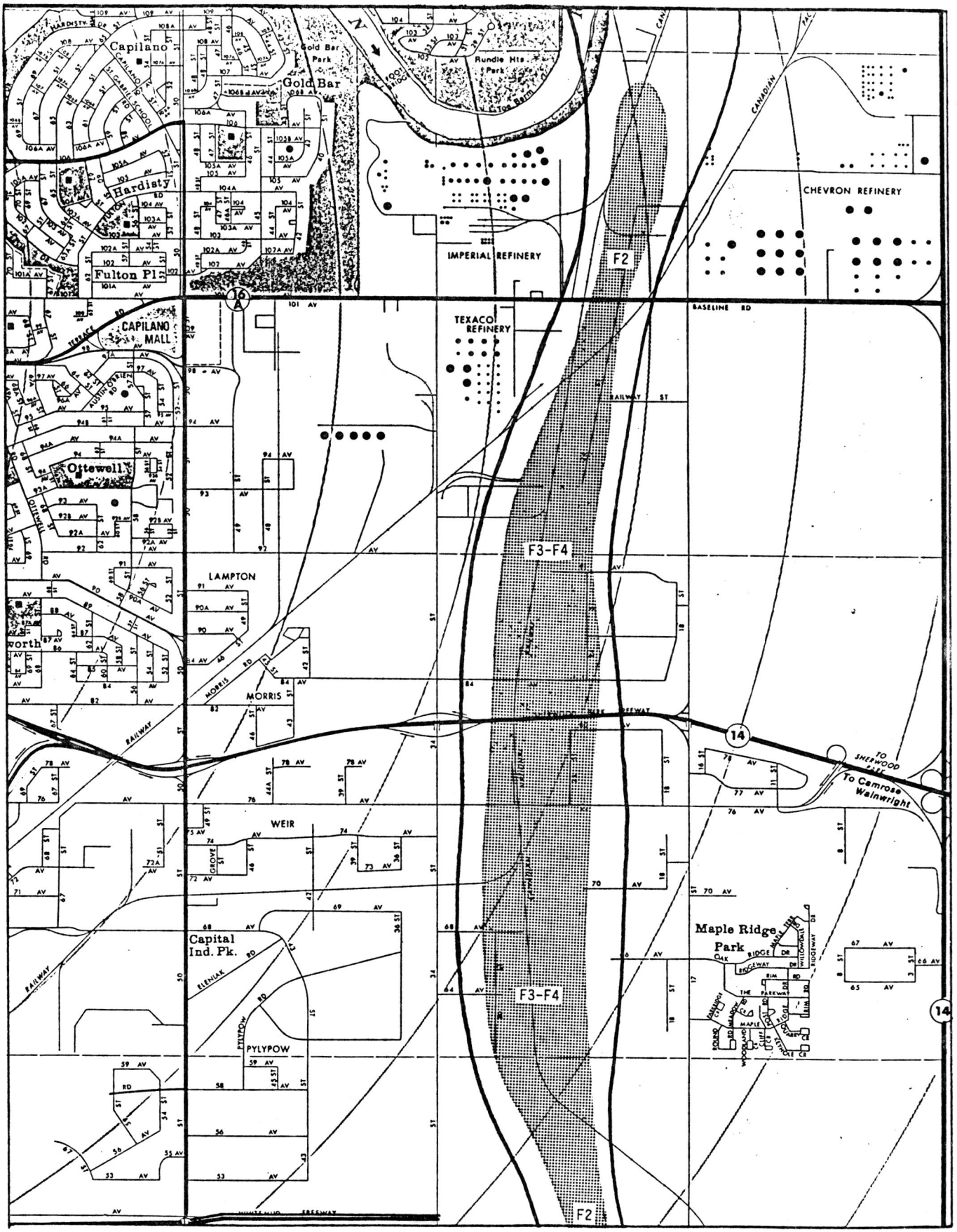


Map 3. Millwoods.
Tornado Damage Path, July 31 1987.
Based on aerial and ground surveys.

Considerable or greater Damage

General Damage F0 - F1

0 1/2 1
Kms

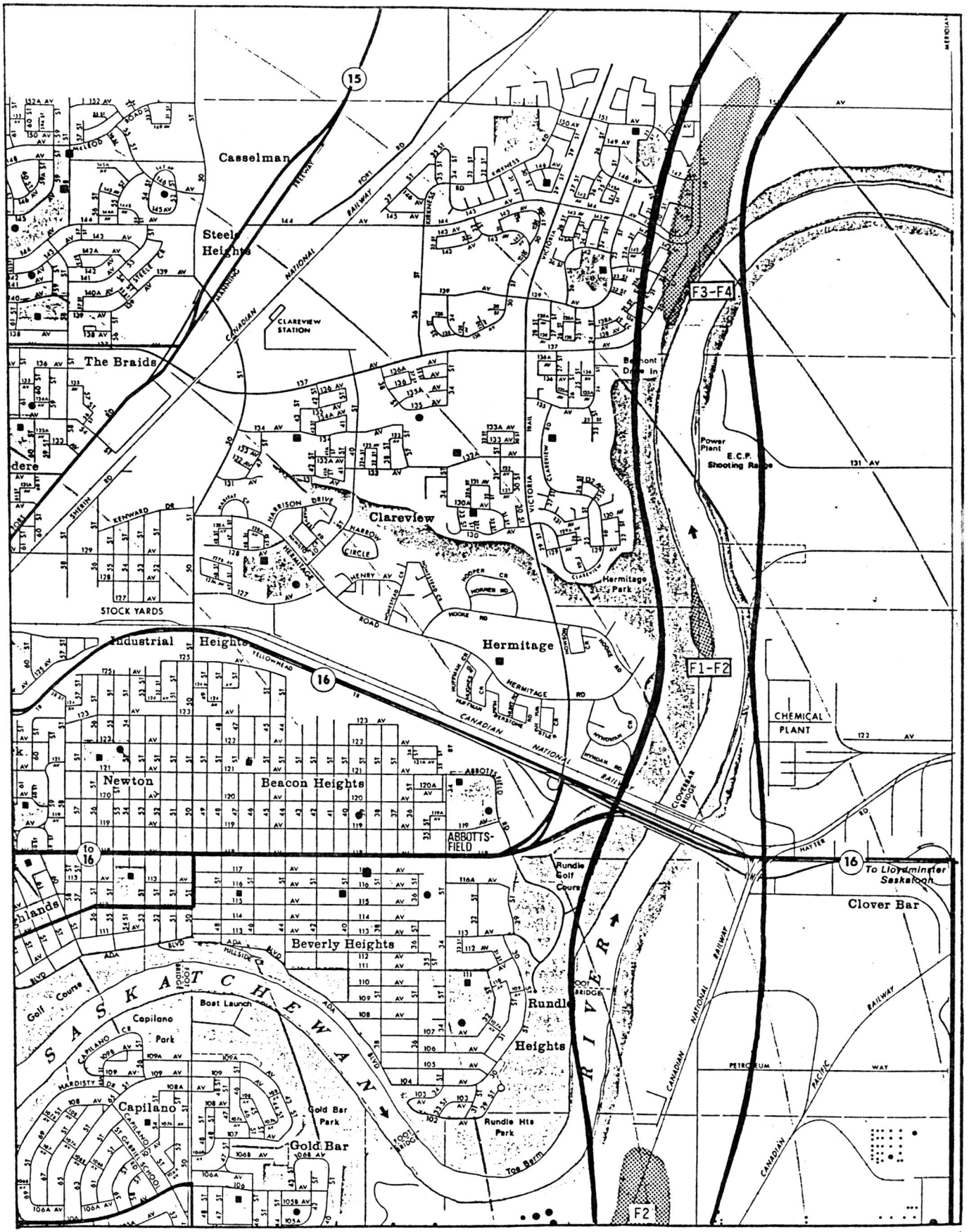


Map 4. Industrial Area.
Tornado Damage Path, July 31 1987.
Based on aerial and ground surveys.

0 1/2 1
Kims

Considerable or greater Damage

General Damage F0 - F1

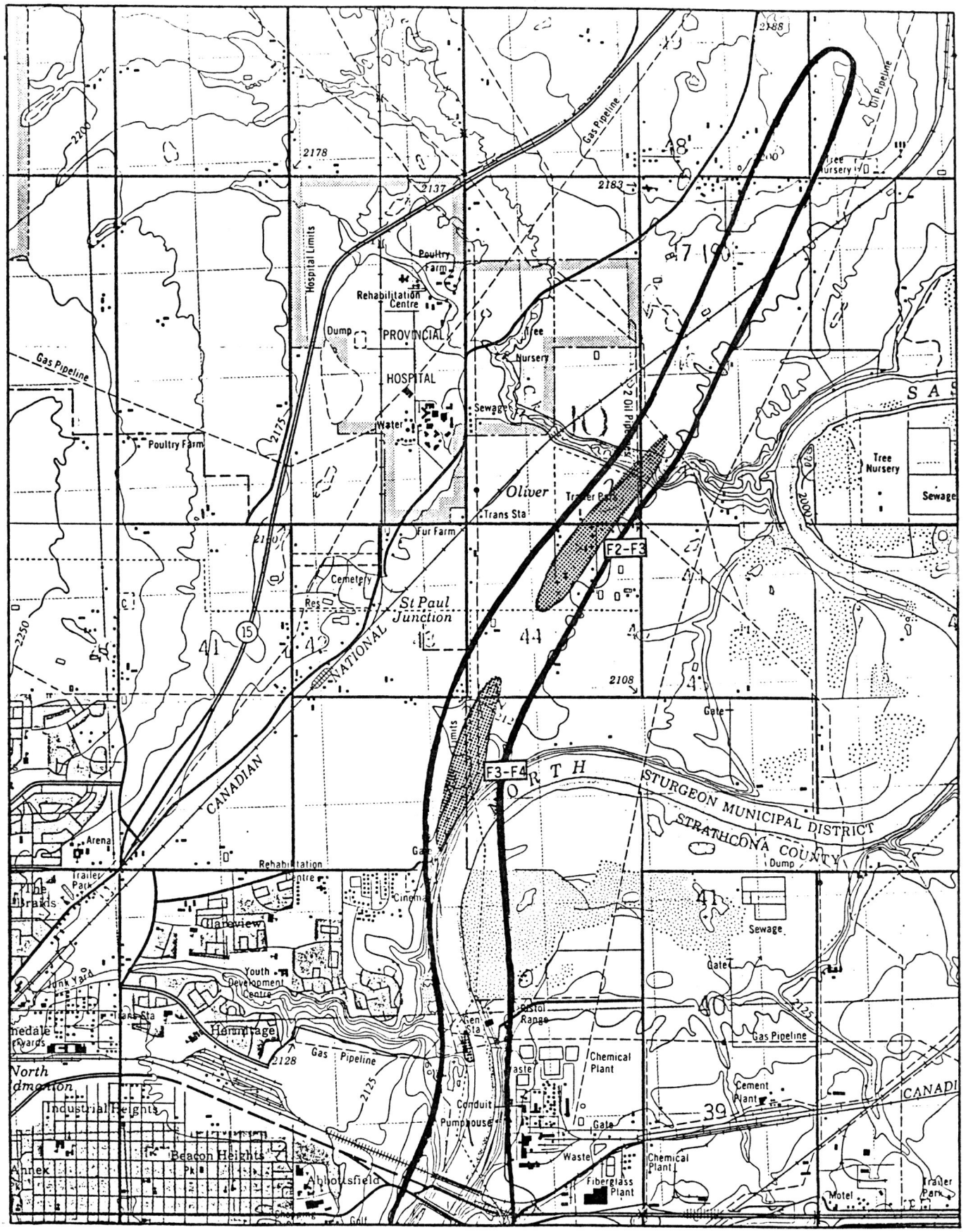


Map 5. Clareview.
Tornado Damage Path, July 31 1987.
Based on aerial and ground surveys.

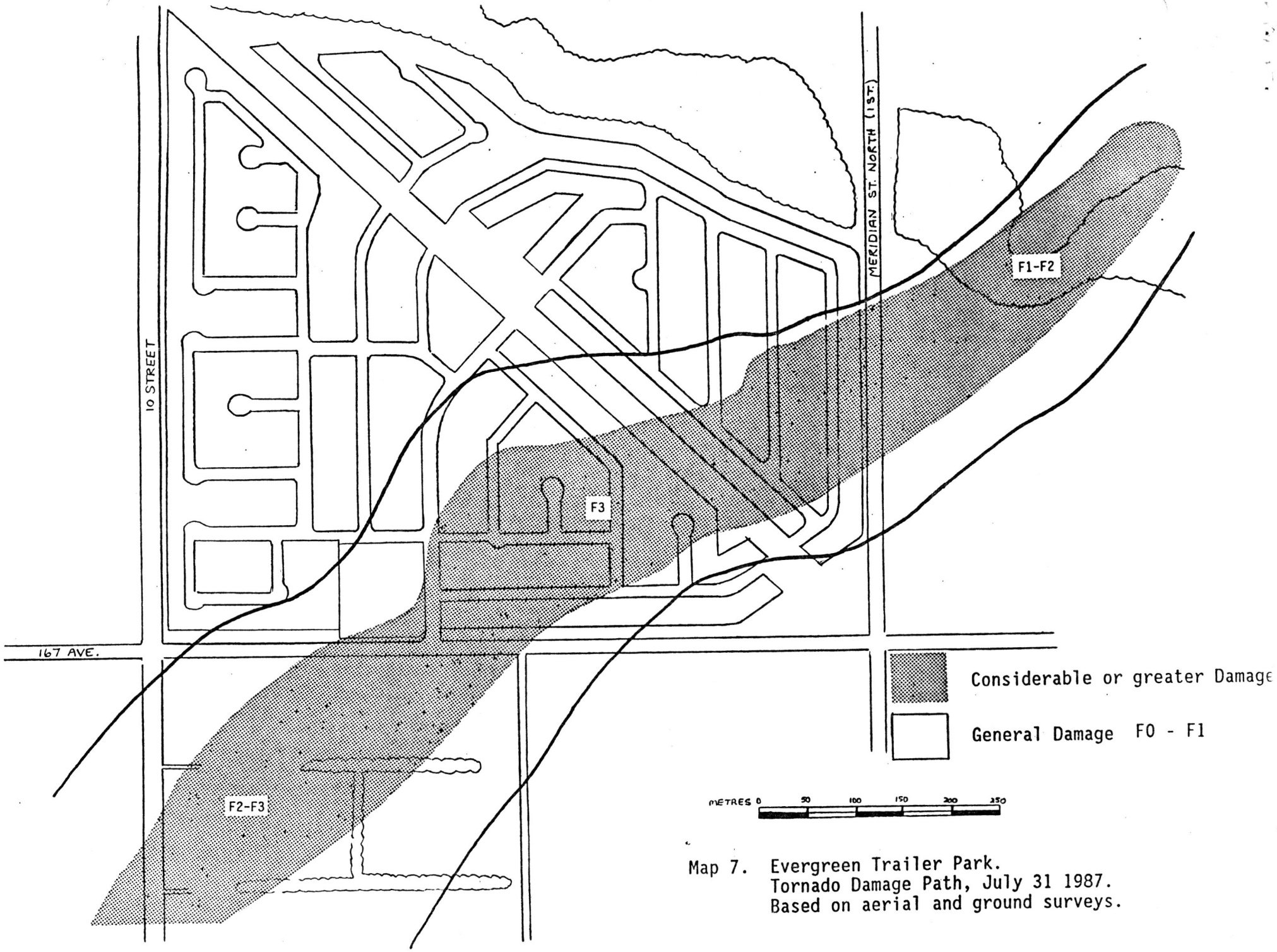
0 1/2 1
Kims

Considerable or greater Damage

General Damage F0 - F1



Map 6. Clareview/Evergreen Trailer Park.
Tornado Damage Path, July 31 1987.
Based on aerial and ground surveys.



Map 7. Evergreen Trailer Park.
Tornado Damage Path, July 31 1987.
Based on aerial and ground surveys.

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Minister Environment Canada | Ministre Environnement Canada

Release

This information was released to the wire services on the date indicated. Despite the delay, some releases and speeches are mailed to out-of-town media because the content is not time-dependent or because it will be useful for background files.

FOR IMMEDIATE RELEASE PR-HQ-087-63

MINISTER RELEASES PRELIMINARY REPORT ON EDMONTON TORNADO

OTTAWA -- 14 August, 1987 -- Federal Environment Minister Tom McMillan today announced the release of an Atmospheric Environment Service Interim Report on the July 31 Edmonton tornado. It describes weather conditions generated during the storm, outlines its physical dimensions and lists the warnings issued by Environment Canada.

The City of Edmonton, the Province of Alberta, media representatives, Emergency Preparedness Canada and other interested groups will join the department in completing a comprehensive report to be made public as soon as possible. The technical, communications and public awareness aspects of the warning and response system will be included.

- 30 -

Further information:

Terry Collins
Office of the Minister
Environment Canada
(819) 997-1441

Brian O'Donnell
Environment Canada
(403) 420-3143

Canada

TRACK OF THE EDMONTON TORNADO
FRIDAY, JULY 31, 1987
SUMMARY OF PRELIMINARY REPORT

During the afternoon of Friday, July 31, 1987, eastern Edmonton and adjoining communities were struck by a devastating tornado. It caused 27 deaths, hundreds of injuries and over $250 million in property damage.

The first report of a tornado was received from the public at 2:59 p.m. MDT. The initial touch-down was brief with minimal damage. About 3:01 p.m. the tornado again contacted the ground and damage surveys indicate it was a continuous event until its dissipation over one hour later.

From its second touch-down southeast of Beaumont at 3:01 p.m. to its dissipation northeast of the Evergreen Trailer Park at 4:05 p.m., the tornado travelled a distance of about 40 km at an average speed of 35 km/h. The damage path varied in width from about 100 m to near 1000 m. The tornado was at its most destructive in the eastern industrial area of Clareview, and the Evergreen Trailer Park. The devastating damage in these districts resulted in the tornado being classified as a strong F3, at times reaching F4 intensity* on the Fujita Tornado Intensity Scale. As well, considerable damage was evident east of Beaumont and in the Millwoods residential area.

Environment Canada had in effect both a Severe Weather Watch (issued 1:40 p.m. MDT) and a Severe Weather Warning (issued 2:45 p.m. MDT) for the City of Edmonton and surrounding counties. After receiving the first report of a tornado at 2:59 p.m., the Alberta Weather Centre reacted immediately, issuing a Tornado Warning on Weatheradio Canada. The Tornado Warning was transmitted to the media via wire services starting at 3:07 p.m., providing potential advance warning of 18 minutes to individuals in the industrial area and 48 minutes at the Evergreen Trailer Park. These lead times for tornado warnings are considered internationally as state-of-the-art. The Tornado Warning was maintained until 7:00 p.m. when the threat of tornadoes ended.

Alberta has an average of eight tornado sightings per year. Recent large tornadoes were: Athabasca, June 29 1984; Lloydminster, July 8, 1983; and Rocky Mountain House, June 30, 1982.

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* A review of the damage by the University of Chicago classified the tornado F4. Equivalent wind speeds F3: 253 - 330 km/h and F4: 331 - 417 km/h.

TRACK OF THE EDMONTON TORNADO: JULY 31, 1987

PRELIMINARY REPORT

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1. Introduction

On July 31, 1987 a devastating tornado struck the City of Edmonton and surrounding communities. Heaviest damage occurred in the eastern sections of the city, with the Evergreen Trailer Park, eastern industrial area and the residential areas of Millwoods and Clareview suffering the most severe destruction. The tornado caused 27 deaths, hundreds of injuries and property damage over $250 million.

This report has been prepared using information gathered in the week following the tornado. The findings should be viewed as preliminary and are subject to adjustments and refinements as more information becomes available.

This preliminary report describes the weather conditions that generated the storm, describes the physical dimensions of the tornado, and outlines the watches and warnings issued by Environment Canada.

The City of Edmonton, Environment Canada, and other agencies concerned with public safety will be co-ordinating a more in-depth review of all matters related to the July 31 tornado.

3. Meteorological Conditions

The last 10 days of July had been hot with temperatures at or near record values. Humidities had been increasing with dewpoints, a measure of humidity, reaching near 20 degrees (10 degrees above normal). Thunderstorms had been frequent during this period, and had necessitated the issuance of a number of severe weather watches and warnings. Damaging winds, large hail, heavy downpours and record lightning activity were associated with the thunderstorms. On Thursday July 30, two lines of severe thunderstorms had crossed the Edmonton region accompanied by damaging winds.

Friday, July 31 dawned sunny, and although surface temperatures and humidities were lower than the previous days, the airmass continued to have the potential for strong thunderstorms. The circulation maintained a southerly flow of warm, moist air. As the day progressed, surface temperatures and dewpoints rose. Thunderstorms began developing in the late morning along the Rocky Mountain Foothills and by early afternoon were moving northward across central Alberta. A cold front was sweeping eastward across Alberta providing an additional lift mechanism for the formation of severe thunderstorms. A line of thunderstorms southwest of Edmonton intensified rapidly and moved toward the city at about 70 km/h. A new thunderstorm cell developed explosively ahead of the line, in the Leduc area, and moved northward. This would prove to be the storm that produced the tornado. The line overtook the cell and together they moved northward through eastern Edmonton. In addition to the tornado, hail as large as softballs, strong winds and rain amounts of 40 - 50 millimetres were reported in the city. Approximately two hours after the first thunderstorms, a second line moved through the city, again producing heavy rain, hail and damaging winds (greater than 110 km/h).

4. Weather Forecasts and Warnings

The public forecast issued at 5:00 A.M. for the Edmonton region predicted an 80% probability of thunderstorms, noting that they would be heavy at times. At 11:00 A.M. the public forecast stated the thunderstorms would produce hail, damaging winds and heavy downpours.

Central and southern Alberta had been identified as the area having the highest potential for severe thunderstorms. A Severe Weather Watch was issued for Calgary and Red Deer regions when thunderstorms began developing along the Foothills. At 1:40 P.M., as the line moved away from the Foothills and headed toward Edmonton, another Watch was issued for the Edmonton Region. Continued intensification of the storm cells led to a Severe Weather Warning being issued at 2:45 P.M. for the City of Edmonton and the counties to the south and west. A special alert tone was sounded at 2:52 P.M. on Weatheradio Canada operated by Environment Canada at which time the Warning was broadcast.

The first report of a tornado was received at 2:59 P.M. At 3:04 P.M., the Weatheradio alert tone was again sounded and the Tornado Warning was broadcast. A Tornado Warning was issued to the wire services at 3:07 P.M. for the City of Edmonton and the counties of Strathcona and Leduc. At 3:30 P.M., the Tornado Warning was updated and extended to counties to the east and north of Edmonton. At 4:55 P.M., the Tornado Warning was again updated as the second line of severe thunderstorms approached the city. By 7:00 P.M., the risk of severe thunderstorms for the Edmonton area was over and the Tornado Warning, Severe Weather Watch and Severe Weather Warning were ended.

Beaumont Area - Ellerslie Road: 1455 - 1515 hours (hrs) MDT (Map 2)

Little damage was visible at the funnel's first contact with the ground. After the tornado set down again, about 3 km southeast of Beaumont, only minor damage was visible. As it moved northward and strengthened, F1-F2 damage was apparent 2 km south-southeast of Beaumont although the path width was narrow (less than 100 m). About 1.5 km southeast of Beaumont, damage was more severe (F2-F3) with the destruction of several farm buildings. The tornado appeared to weaken as it continued northeastward then gain strength as it hit the Hilltop Dairy Farm (about 2.5 km northeast of Beaumont) at about F2-F3. Extensive roof damage to 3 new homes east of 34 St. 1.3 km south of Ellerslie Road indicates F2 strength. As the tornado crossed Ellerslie Road appeared to maintain F2 strength.

Millwoods: 1515 - 1525 hrs MDT. (Map 3)

As the tornado moved into southeast Millwoods, its damage path was 750 - 1000 m wide with the most significant damage about 500 m wide. As the tornado moved north, transmission towers were toppled and tree damage was evident (F2). The damage path crossed west of 34 St. at 19 Ave. Homes along the east side of 35 St. between 20 and 22 Ave. were damaged, consistent with an F2 tornado. The main damage track then veered east of 34 St. to the north of 23 Ave. and continued northward. The tornado appeared to weaken to F1 as it passed northeastern Millwoods.

Industrial Area: 1525 - 1540 hrs MDT. (North of Whitemud Freeway to the River Valley, between 34 St. and 17 St. - Map 4)

After the tornado crossed the Whitemud Freeway, it gained strength to the F3 level approaching the F4 level. Damage was extensive and devastating within an area 600 - 700 m wide, from west of the CNR tracks to about 24 Street. Moderate damage extended to about 1000 m wide. Within the more severely damaged zone of 600 - 700 m, buildings were totally destroyed, cars and trucks were picked up and moved considerable distances or suffered

6. Other Severe Weather Phenomena

Very large hail, up to softball size, was reported in south Edmonton and the eastern sections of Edmonton south of the River. Torrential rains accompanied the storm complex across all parts of the City and produced local flooding. Strong and gusty winds together with downbursts from the thunderstorm also caused some damage near to, but not within, the tornado path.

A second line of thunderstorms moved across the city in the early evening. This was accompanied by strong wind gusts (110 km/h reported) and hail.

7. Summary

Tornadoes occur every year in Alberta. The tornado that devastated portions of eastern Edmonton on July 31, 1987 was, however, a rare event.

Surveys of the damage led to this tornado being tentatively classified as a strong F3 on the Fujita Tornado Intensity Scale. Along the path of the tornado varying scales of damage were visible, ranging from F0 to occasionally as high as F4.

The damage path extended from southeast of Beaumont to northeastern Edmonton over a length of nearly 40 kms. Damage over half of the path indicates a tornado of intensity F2 or stronger. The width of severe destruction varied from 200 m to as much as 700 m.

Continued investigations of this tornado and comparisons with other tornadic events in Canadian history, will further define the magnitude of this event.

8. Reference

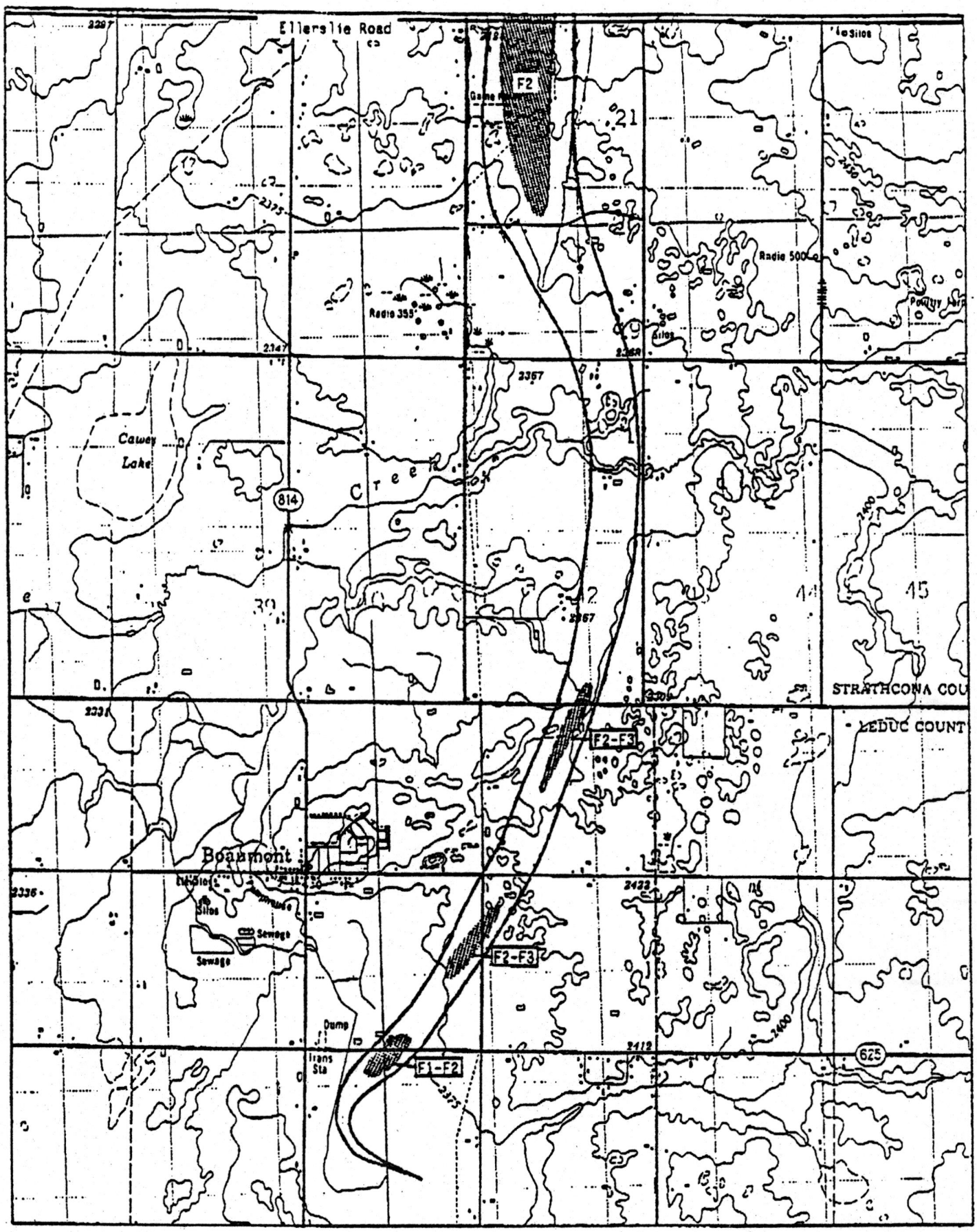
1. Hage, K.D., 1982, Preliminary List of Tornadoes in Alberta 1960 - 1982, Unpublished manuscript.

Table 1. The Fujita Tornado Intensity Scale.

	Surface Wind Speed (km/h)	Expected Damage
F0	64 - 116	Light
F1	117 - 180	Moderate
F2	181 - 252	Considerable
F3	253 - 330	Severe
F4	331 - 417	Devastating
F5	418 - 509	Incredible

Table 2. Tornado Chronology. Based on eyewitness accounts. Times are best estimates available.

Time (hrs/MDT)	Location
1455	First known touchdown in the vicinity of Leduc.
1501	Beginning of the 40 km track, 3-4 km southeast of Beaumont.
1507	1-2 km northeast of Beaumont.
1515	Crossed Ellerslie Road between 34 St. and 17 St.
1520	Moved through southeastern Millwoods.
1530	Northeast of Millwoods.
1535	Moving through Sherwood Park Industrial area.
1540	Moving into the River Valley near the Strathcona Science Park.
1550	Moving through eastern Clareview.
1553	Farms just southwest of Trailer Park hit.
1555	Moving into Evergreen Trailer Park.
1605	Dissipates 5 km northeast of Trailer Park.



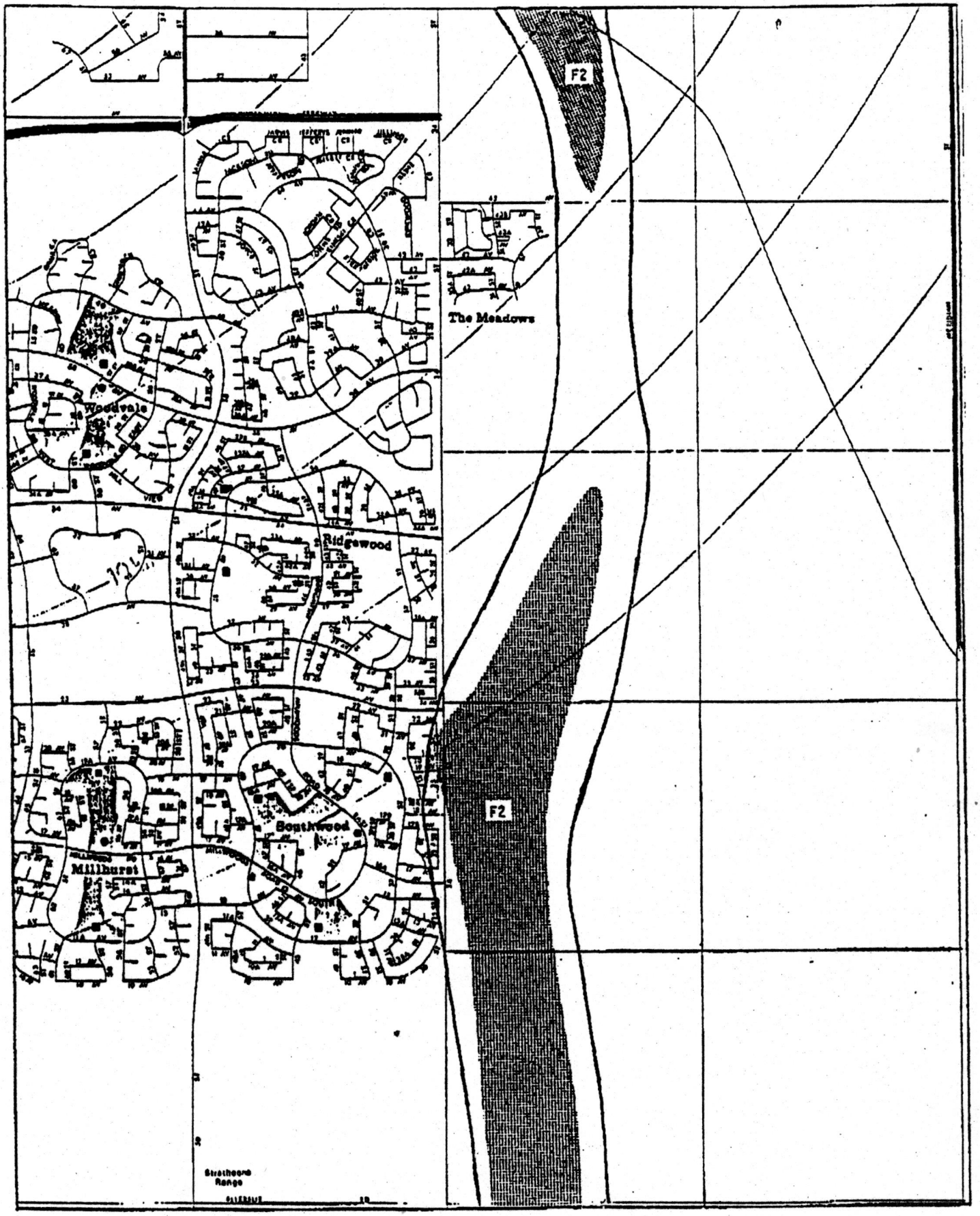
Map 2. Beaumont Area - Ellerslie Road.
Tornado Damage Path, July 31 1987.
Based on aerial and ground surveys.

Considerable or greater Damage

General Damage F0 - F1

Metres 1000 0 1000 2000 3000

8.11.1987 15:42 P. 2
FROM EOE AES COMM EDM

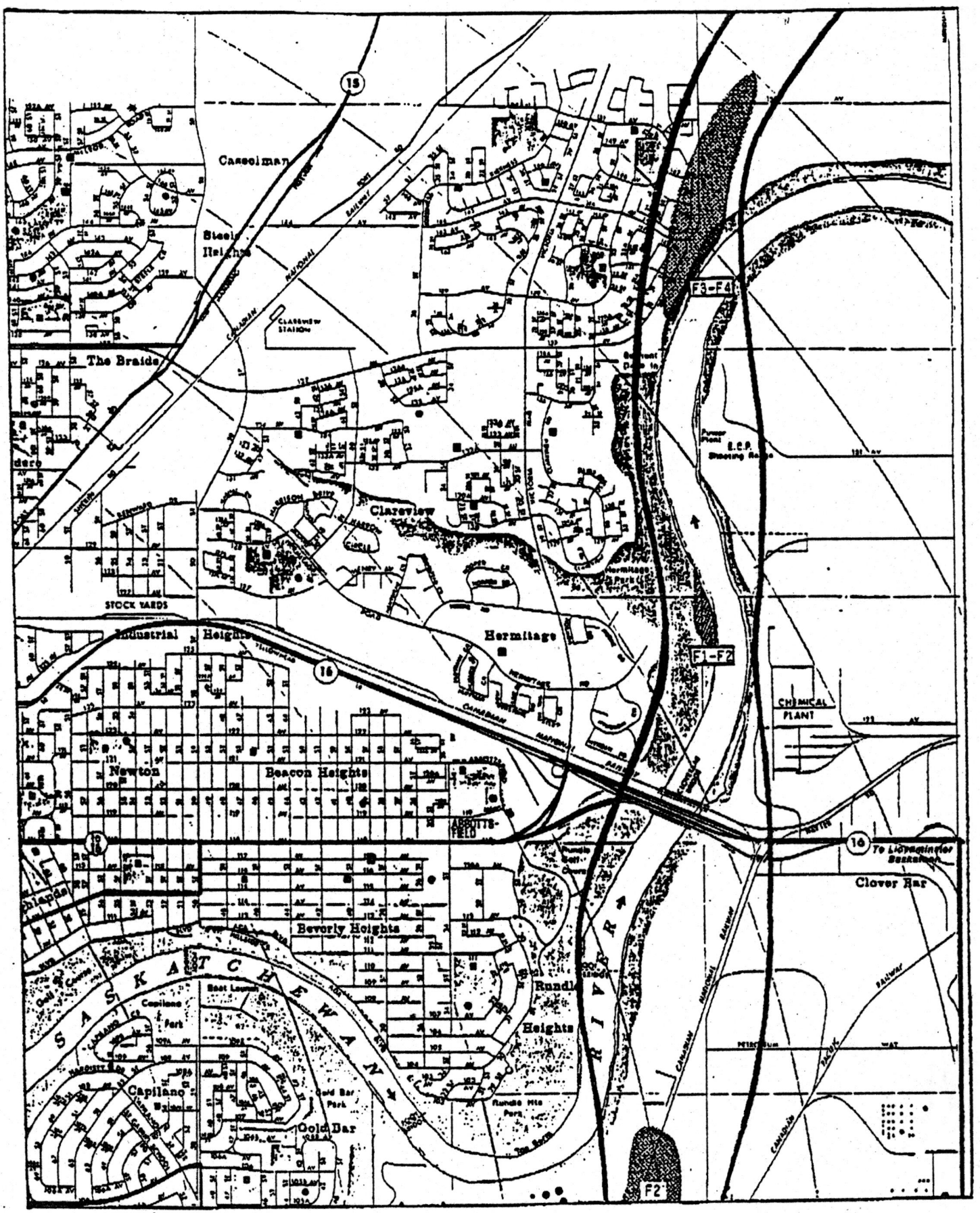


Map 3. Millwoods.
Tornado Damage Path, July 31 1987.
Based on aerial and ground surveys.

Considerable or greater Damage.

General Damage F0 - F1

FROM EOE AES COMM EDM 8.11.1987 15:43 P.3



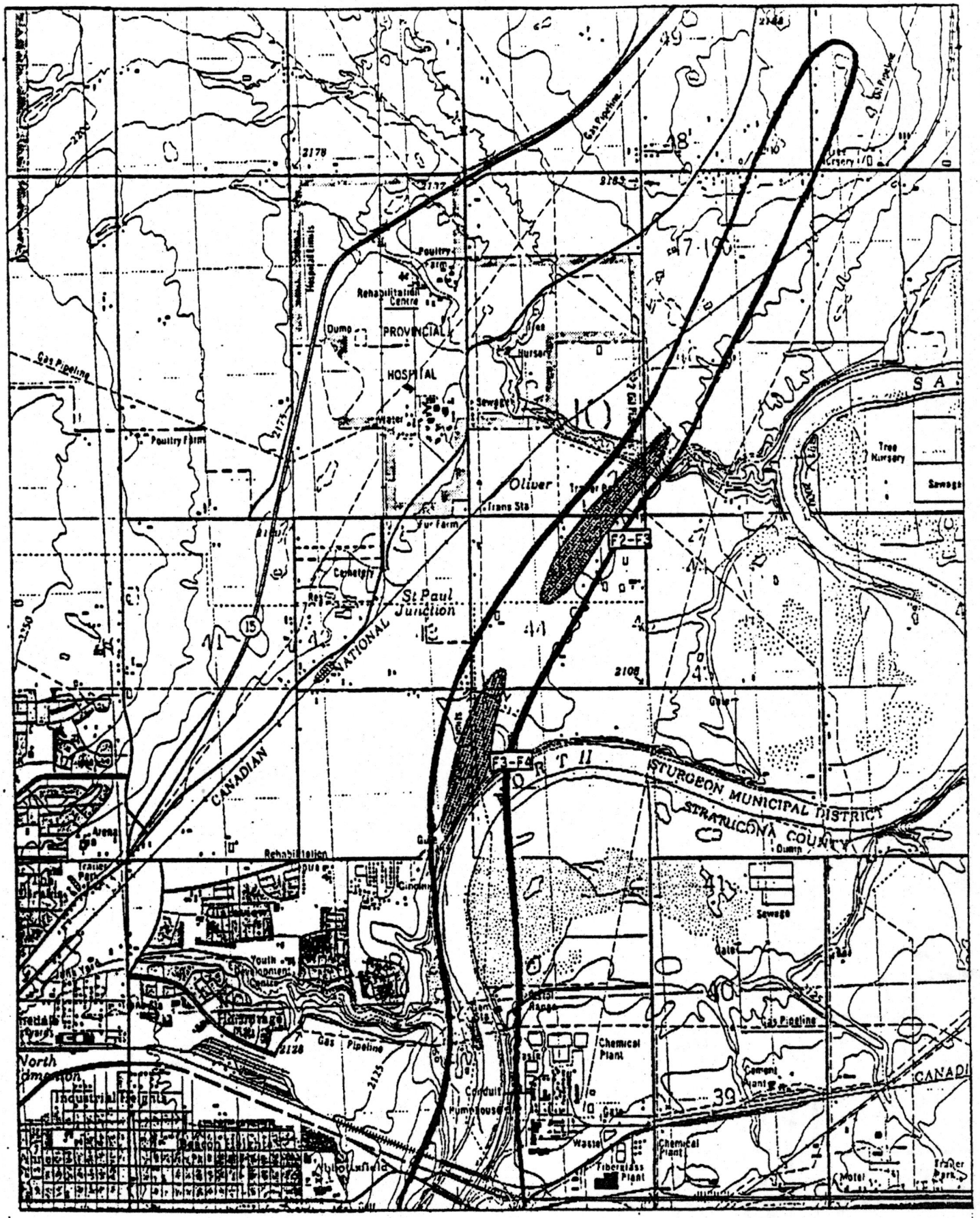
Map 5. Clareview.
Tornado Damage Path, July 31 1987.
Based on aerial and ground surveys.

Considerable or greater Damage

General Damage F0 - F1

0 1/2 Kms

FROM EOE RES COMM EDM 8.11.1987 15:45 P. 5

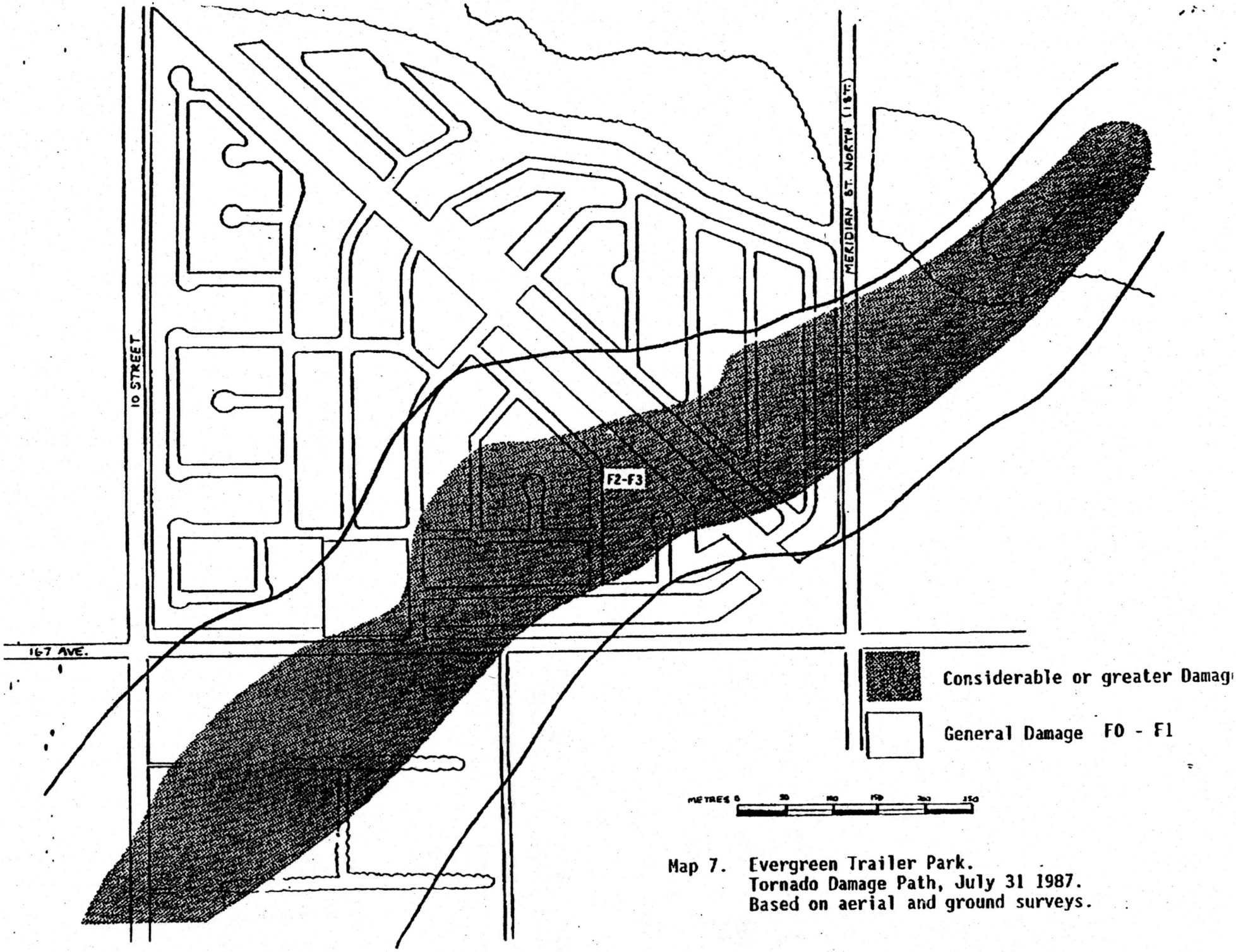


Map 6. Clareview/Evergreen Trailer Park. Tornado Damage Path, July 31 1987. Based on aerial and ground surveys.

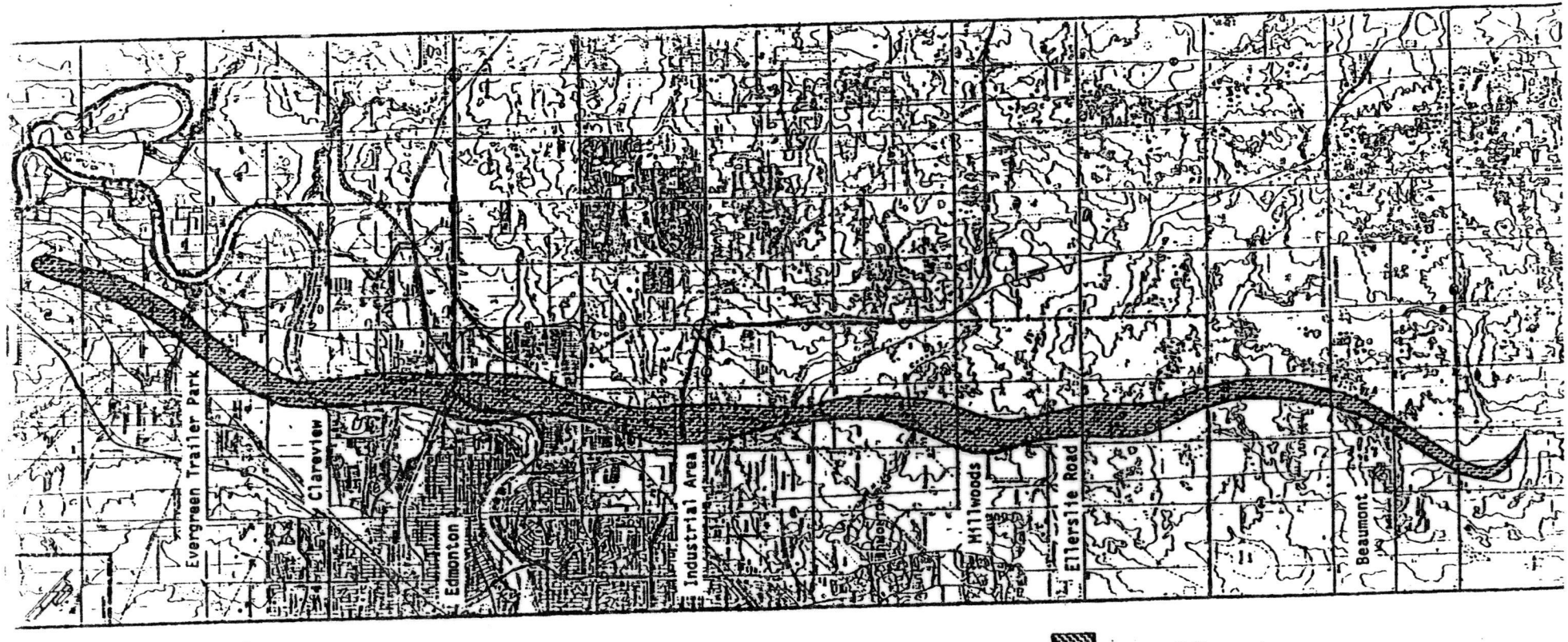
Considerable or greater Damage

General Damage F0 - F1

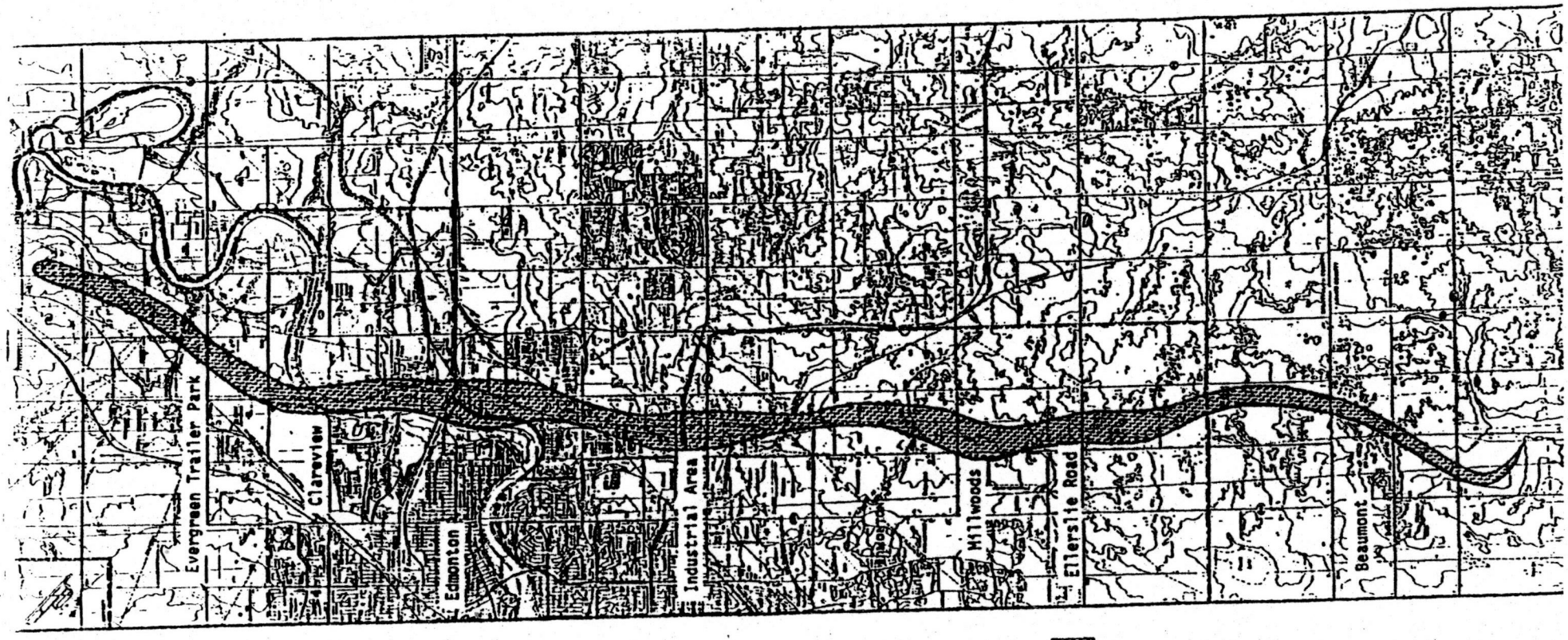
Metres 1000 0 1000 2000 3000



Map 7. Evergreen Trailer Park.
Tornado Damage Path, July 31 1987.
Based on aerial and ground surveys.



Map 1. Tornado Damage Path, Edmonton Tornado July 31, 1987.
Based on aerial and ground surveys.



Map 1. Tornado Damage Path, Edmonton Tornado July 31, 1987.
Based on aerial and ground surveys.

THE EDMONTON TORNADO

Gérard Croteau

On Friday July 31, 1987, in the afternoon, a violent thunderstorm accompanied by tornadoes hit the Edmonton area, causing heavy damages and the loss of life. A little later, torrential rain fell over northern Alberta. After a brief review of the events, the performance and usefulness of a few of the CMC products in these circumstances will be examined.

On the morning of July 31 (1200Z), a 500 mb vorticity center was located over the Washington State's west coast (Figure 1). A trough extended from the British Columbia coast to another center over Alaska. Temperatures of -22°C to -24°C along the trough as compared to -11°C at Edmonton, revealed a strong gradient in that region. The southwest flow was slightly diffluent over Alberta and Saskatchewan.

For several days, a warm and moist air mass covered these two provinces causing frequent, sometimes violent thunderstorms. Surface temperatures were in the 11°C to 17°C range with 10°C to 15°C dew points. The presence of a vorticity center aloft was reflected on the surface by two lows, connected by a cold front and located near Jasper and over northwestern Montana, respectively (Figure 2). Note the absence of American data due to difficulties in communications. Because of a very slack isobaric gradient, the depression near Jasper was not caught by the objective analysis. Nevertheless, it did show the corresponding 850 mb disturbance (Figure 3).

LA TORNADE D'EDMONTON

Gérard Croteau

Vendredi, le 31 juillet 1987, un orage violent s'est abattu sur Edmonton, dans l'après midi, générant des tornades qui ont causé de lourds dégâts et des pertes de vie. Un peu plus tard, des pluies diluviennes ont touché le nord de l'Alberta. Après une brève revue des événements, nous examinerons la performance et l'utilité de quelques produits du CMC en ces circonstances.

Le matin du 31 juillet (1200Z), un centre de tourbillon à 500 mb se trouvait sur la côte ouest de l'état de Washington (Figure 1). Un creux s'étirait le long de la côte de la Colombie britannique jusqu'à un autre centre sur l'Alaska. Des températures de -22°C à -24°C le long du creux, comparées à -11°C à Edmonton, révélaient un fort gradient dans cette région. La circulation du sud-ouest était légèrement diffluente au-dessus de l'Alberta et de la Saskatchewan.

Une masse d'air chaud et humide recouvrait ces deux provinces depuis déjà plusieurs jours, ayant causé de fréquents orages, parfois violents. Les températures de surface étaient comprises entre 11°C et 17°C avec des points de rosée allant de 10°C à 15°C. Le centre de tourbillon en altitude se reflétait en surface par deux faibles dépressions, reliées par un front froid, et situées respectivement près de Jasper et sur le nord-ouest du Montana (Figure 2). Notons au passage l'absence de données américaines, par suite de difficultés de communications. Le gradient isobarique étant très lâche, l'analyse objective n'a pas perçu la dépression près de Jasper. Elle en a néanmoins identifié la réflexion à 850 mb (Figure 3).

The vorticity center moved to over southern British Columbia during the day, thus bringing positive vorticity advection over southwestern Alberta (Figure 4). The Montana low moved northward while deepening to 1002 mb (Figures 5 and 6). Between noon and 3 p.m. local (from 1800Z to 2100Z), the Edmonton surface pressure dropped 5.5 mb (Annex A). The other depression moved eastward while dragging the cold front (Figure 7). Ahead of the cold front, the increasing southeast flow associated with diurnal heating raised the temperatures to 29°C and dew points up to 19°C in certain areas.

Le centre de tourbillon s'est déplacé sur le sud de la Colombie britannique pendant la journée, créant ainsi de l'advection positive de tourbillon sur le sud-ouest de l'Alberta (Figure 4). La dépression du Montana s'est déplacée vers le nord en se creusant à 1002 mb (Figures 5 et 6). Entre midi et 15 heures locales (de 1800Z à 2100Z), la pression à Edmonton a chuté de 5.5 mb (Annexe A). L'autre dépression se dirigeait vers l'est, entraînant le front froid avec elle (Figure 7). En avant du front, la circulation croissante du sud-est s'alliait au réchauffement diurne pour élever les températures jusqu'à 29°C et les points de rosée jusqu'à 19°C par endroits.

The cold front, already accompanied by violent convection, reached Edmonton near 3 p.m. local time (2100Z). At that time, the tornado touched ground, reaching F4 on the Fujita scale, and causing heavy damages and 27 deaths. The storm lasted about one hour. The northward moving low caused the front to slow down or even retrogress westward. New thunderstorms, accompanied by strong winds and heavy precipitation, were triggered. These phenomenons were to continue during the night in the north of the province.

Le front froid, déjà accompagné de convection violente, a atteint Edmonton vers 15 heures locales (2100Z). C'est alors que la tornade a touché le sol, atteignant F4 sur l'échelle de Fujita, causant de lourds dégâts et 27 pertes de vie. Le tout a duré près d'une heure. À cause de la dépression venant du sud, le front a ensuite ralenti et même régressé vers l'ouest. De nouveaux orages se déclarèrent, accompagnés de vents forts et de précipitations abondantes. Ces phénomènes allaient ensuite se poursuivre pendant la nuit dans le nord de la province.

The Canadian models forecasted the low originally near Jasper approximately 300 km too far north for Friday evening July 31 (Figures 8 and 9). Note that the surface prognoses show no motion for the day. The models did not catch the rapid deepening and the pressures were not low enough. On the other hand, the Finite Element (RFE) model overdeepened the low over South Dakota. The thickness forecasts were adequate with a strong baroclinic zone over Alberta. Strong precipitation was forecasted by the two models for Friday evening, centered over northeastern British Columbia and over southwestern Saskatchewan for the RFE. Small quantities were expected for Edmonton where 44 mm fell on Friday.

Les modèles canadiens ont prévu la dépression initialement près de Jasper environ 300 km trop au nord pour le vendredi soir 31 juillet (Figures 8 et 9). Notons que les pronostics de surface n'indiquent aucun mouvement pour la journée. Le creusement rapide a aussi échappé aux modèles qui ont sous-estimé la dépression. Le modèle aux éléments finis (EFR), par contre, a trop creusé la dépression sur le Dakota du sud. Les prévisions d'épaisseurs étaient adéquates avec une forte zone barocline sur l'Alberta. Les deux modèles ont prévu de fortes précipitations pour le vendredi soir, mais centrées sur le nord-est de la Colombie britannique et, pour le EFR, sur le sud-ouest de la Saskatchewan. De faibles quantités étaient prévues pour Edmonton qui a reçu 44 mm le vendredi.

The purpose of the CMC violent summer weather charts is to assist the forecasters in this type of situation. The 250 mb chart shows that the jet stream, located over southeastern British Columbia in the morning, was to go through a translation bringing it just to the south of Edmonton, its axis still pointing north (Figure 10). The chart sent 12 hours in advance was showing 80 knots winds, which were 20 knots stronger than on the preceding chart and confirmed by the following analysis (Figure 11). The temperature chart was showing a gradient ranging in intensity from more than 25°C over northeastern Alberta to near 15°C over the southwest (Figure 12). The dew points were forecasted greater than 10°C. There is room for improvement here since the analysis shows values higher than 15°C. The low level wind chart (Figure 13) suggests a low center near the British Columbia border with a wind shift line extending towards southwestern Saskatchewan. This was a good approximation of the frontal position. On the other hand, the depression was too far to the northwest.

The available convection and violent weather indices were in general agreement. A high instability region over northern Alberta was extending towards a weaker center to the south of Saskatchewan. The Showalter index, with a value of less than 5, and Sweat, with more than 300, were suggesting a high probability of violent weather (Figure 14 and annex B). In agreement with the surface models, these indices were placing too high an emphasis on the possibility of severe thunderstorms in the north of the province. On the other hand, the lifting index shows the maximum probability of severe thunderstorms much closer to Edmonton, with a value of minus 5 a little farther east (Figures 15).

Les cartes de temps violent d'été émises par le CMC ont précisément pour but d'aider les prévisionnistes dans ce genre de situation. La carte de 250 mb montre que le courant-jet, qui se trouvait sur le sud-est de la Colombie britannique le matin, devait subir une translation qui l'amenait juste au sud d'Edmonton, pointant toujours vers le nord (Figure 10). La carte émise 12 heures en avance indiquait des vents de 80 noeuds, qui étaient de 20 noeuds supérieurs à ceux de la carte précédente et fut ensuite confirmée par l'analyse (Figure 11). La carte de températures montrait un gradient allant de plus de 25°C sur le nord-est de l'Alberta à près de 15°C sur le sud-ouest (Figure 12). Les points de rosée étaient prévus supérieurs à 10°C, ce qui laisse à désirer ici car l'analyse porte des valeurs de plus de 15°C. La carte des vents à bas niveaux (Figure 13) suggère un centre dépressionnaire près de la frontière de la Colombie britannique avec une ligne de changement de vent vers le sud-ouest de la Saskatchewan. C'était une bonne approximation de la position du front. La dépression, par contre, était trop loin au nord-ouest.

Tous les indices disponibles de convection et de temps violent concordaient dans l'ensemble. Une région de forte instabilité sur le nord de l'Alberta s'étirait vers un centre plus faible au sud de la Saskatchewan. Les indices Showalter, avec une valeur de moins 5, et Sweat, avec plus de 300, suggéraient une probabilité très élevée de temps violent (Figure 14 et Annexe B). Cohérents avec les modèles de surface, ces indices concentraient trop sur le nord de la province la possibilité d'orages sévères. L'indice de soulèvement, par contre, indique le maximum de probabilité d'orages violents beaucoup plus près d'Edmonton, avec une valeur de moins 5 un peu plus à l'est (Figure 15).

The northward bias of the Showalter and Sweat indices is no doubt related to the fact that the main depression was forecasted too far north. Various factors may explain this bias. The absence of American data for the morning analysis may have had an adverse effect on the models. The presence of the mountains may have had a negative impact on the analysis and the forecast fields, in view of the weak initial intensity of the lows. Also, these may be considered as meso-scale phenomenons, which are difficult to handle with the present models' resolution. Even at 500 mb, it is surprising to find that the temperature after the tornado had not changed since morning. Since violent thunderstorms generally follow a cooling aloft, a finer analysis would have, not doubt, revealed interesting details. Finally, the fact that Edmonton lied outside the threatened zone for two of the indices may be due to a smoothing of their gradients, brought about by resolution limits of the model.

Le biais vers le nord des indices Showalter et Sweat est sans doute lié au fait que la dépression principale était prévue trop au nord. Différents facteurs peuvent expliquer ce biais. L'absence des données américaines pour l'analyse du matin a pu nuire aux modèles. La présence des montagnes peut avoir perturbé les champs d'analyse et de prévision, considérant la faible intensité initiale des dépressions. De plus, on peut considérer celles-ci comme des phénomènes d'échelle moyenne, difficilement accessibles à la résolution des modèles. Même à 500 mb, il est surprenant de constater que la température après la tornade n'avait pas changé depuis le matin. Puisque les orages violents suivent généralement un refroidissement en altitude, une analyse beaucoup plus fine aurait sans doute révélé des détails intéressants. Enfin, le fait qu'Edmonton figure à l'extérieur de la zone de menace pour deux des indices peut provenir d'un lissage de leurs gradients, causé par les limites de résolution du modèle.

The July 31 situation in Alberta illustrates the usefulness and limitations of the CMC guidance. The constant improvements, and possibly the introduction of meso-scale models, should push back these limitations, bearing in mind, however, that they are somewhat inherent to this type of phenomenon.

La situation du 31 juillet en Alberta illustre la pertinence et les limites du soutien fourni par le CMC. Les perfectionnements incessants, et peut-être l'utilisation de modèles à l'échelle moyenne, parviendront à repousser ces limites, sans oublier toutefois qu'elles sont un peu inhérentes à ce genre de phénomène.

NNEXE B

TEMPS CONVECTIF ASSOCIÉ

Stable/Pas d'averses
Légèrement instable/Averses possibles
Instable/Orages probables

Très instable/Orages violents probables
Très instable/Orages violents, tornades probables

TEMPS CONVECTIF ASSOCIÉ

Stable/Pas D'averses
Légèrement instable/Averses possibles
Instable/Orages probables

Très instable/Orages violents possibles

NDICE SWEAT

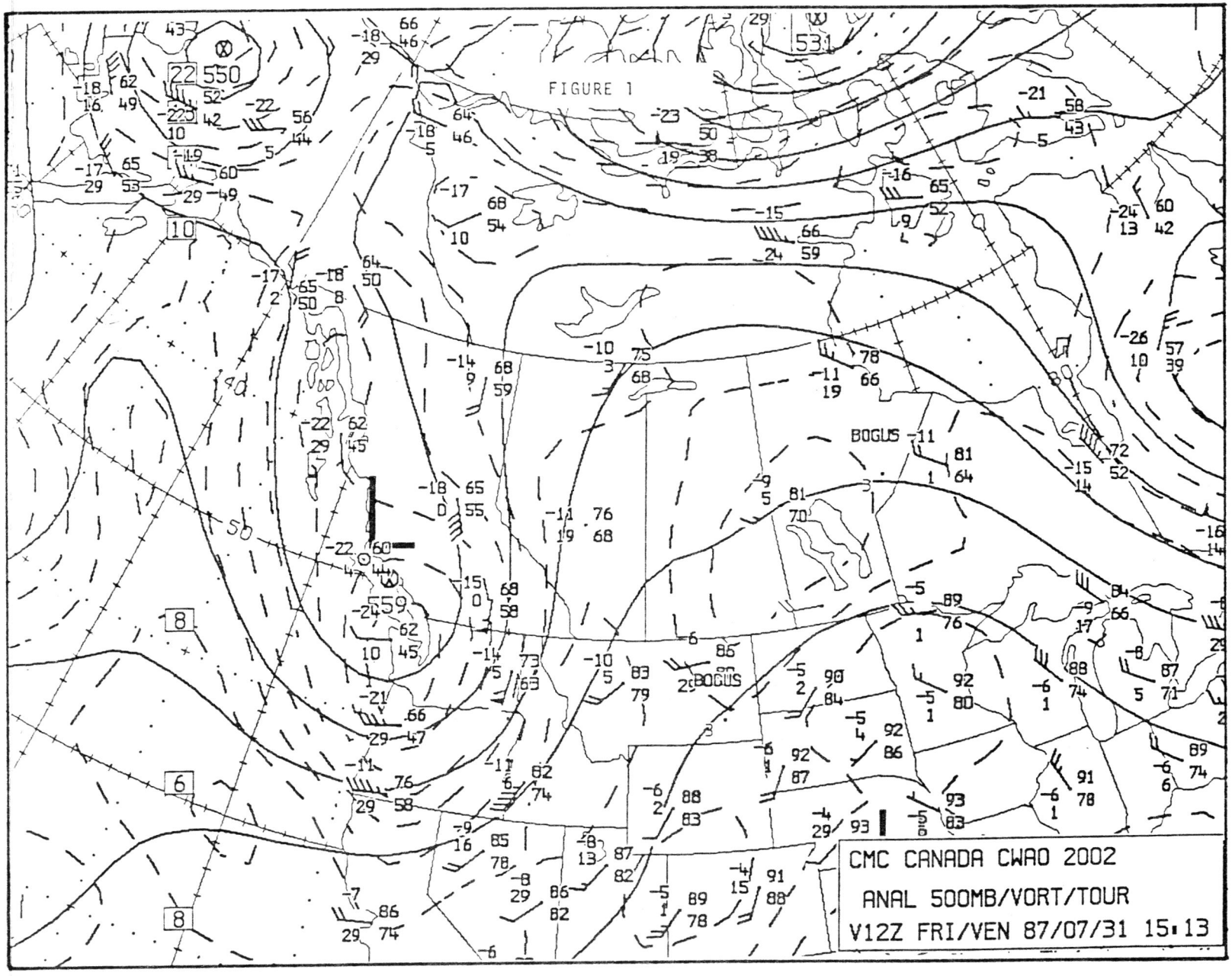
er les orages violents des

Limite inférieure pour l'apparition d'orages violents
Limite inférieure pour l'apparition de tornades

ANNEXE A/

14Z YEG SA 1400 80 SCT 100 SCT 300 —SC
ACC1AC1CI1 4434=.
15Z YEG SA 1500 80 SCT 120 SCT 15+ - 009
8533=
16Z YEG SA 1600 90 SCT 120 SCT 15+ - 008
17Z ...OBSERVATION FOR YEG IS 24 HO HOIURS
18Z YEG SA 1800 28 SCT 90 SCT 300 - -BKN
8014 9456=
19Z YEG SA 1900 M30 BKN 15+ 068/24 4/118.
20Z YEG SA 2000 M23 BKN 15+ 057/24 4/119
0699=
21Z YEG RS 2100 22 SCT E35 OVC 3TRW RW— 0
FRESFR VSBY E QUAD 2 84XX=
22Z YEG SA 2200 7 SCT 18 SCT M35 O OVC
SHWRS HVYR N-E-SE 59XX=
23Z YEG SA 2300 20 SCT E35 BKN 110 12
SHWRS NW-NE-E LTGCG E CC N 81
YEG SP 2355 8 SCT E30 BKN 2550
HVYR SHWRS N QUAD VSBY 4=
WOA SA 0159 AUTO3 MMM 1
0Z YEG SA 0000 8 SCT E30 BKN 250 OVC
SF2CB7CI1 SHWRS HVYR N QUA AD RS
1Z YEG SA 0100 8 SCT 30 SCT M80 8 BKN
SF1CB5ACC2CI2 SHWRS N QUAD 75
2Z YEG SA 0200 20 SCT E90 BKN 250 BKN
4889=
3Z YEG SA 0300 30 SCT 90 SCT E250 BKN
3010 0567=
4Z YEG SA 0400 30 SCT 80 SCT E250 BKN
5867=
5Z YEG SA 0500 40 SCT 250 -SCT 15 5+ 0
6Z YEG SA 0600 40 SCT 250 -SCT 15 5+ 0
7Z YEG SA 0700 50 SCT 15+ 041/12/ /8,/2
8Z YEG SA 0800 50 SCT 15+ 037/11/ /8,/2
9Z YEG SA 0900 M45 BKN 15+ 036/11 1/88/1
10Z YEG SA 1000 M45 BKN 15+ 031/12 2/99/2
11Z YEG RS 1100 25 SCT M45 BKN 15+ +R— 0
12Z YEG SA 1200 25 SCT M50 BKN 15+ +R— 0

FIGURE 1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ANAL 500MB/VORT/TOUR
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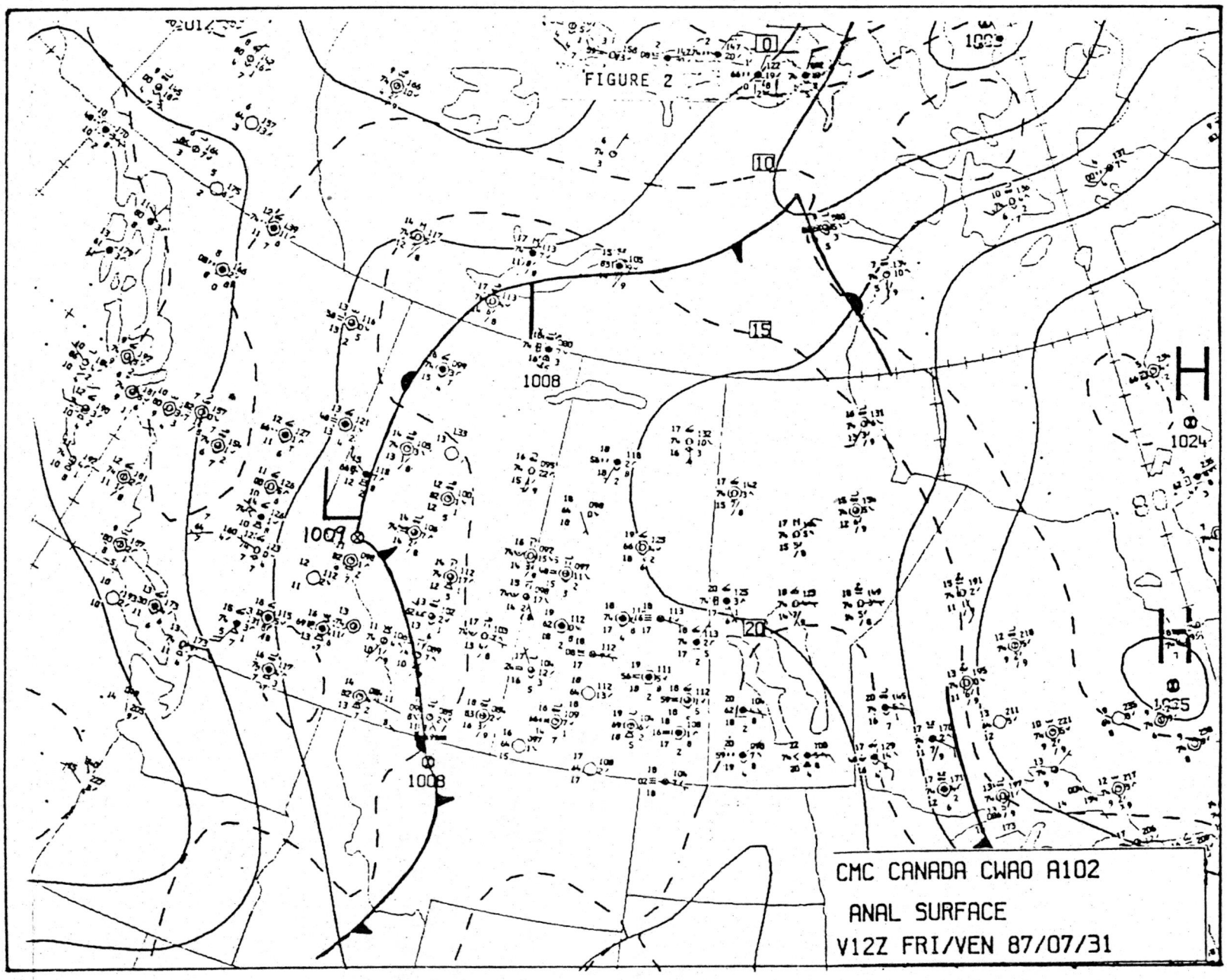
BOGUS
BOGUS

FIGURE 2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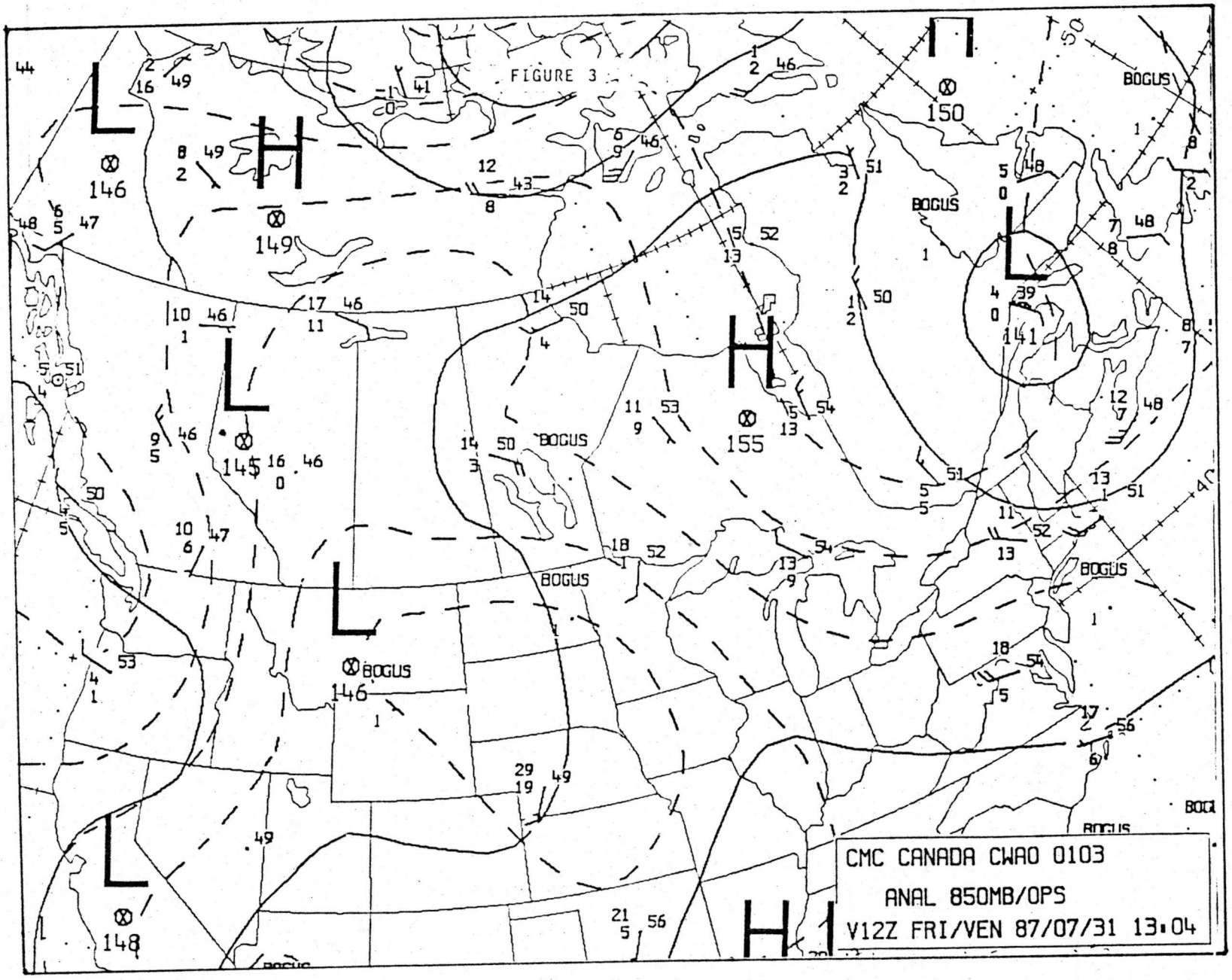
0
10
15
20
1008
1009
1008
1024
1025
CMC CANADA CWAO A102
ANAL SURFACE
V12Z FRI/VEN 87/07/31

FIGURE 3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146
149
150
141
155
145
148

FIGURE 4

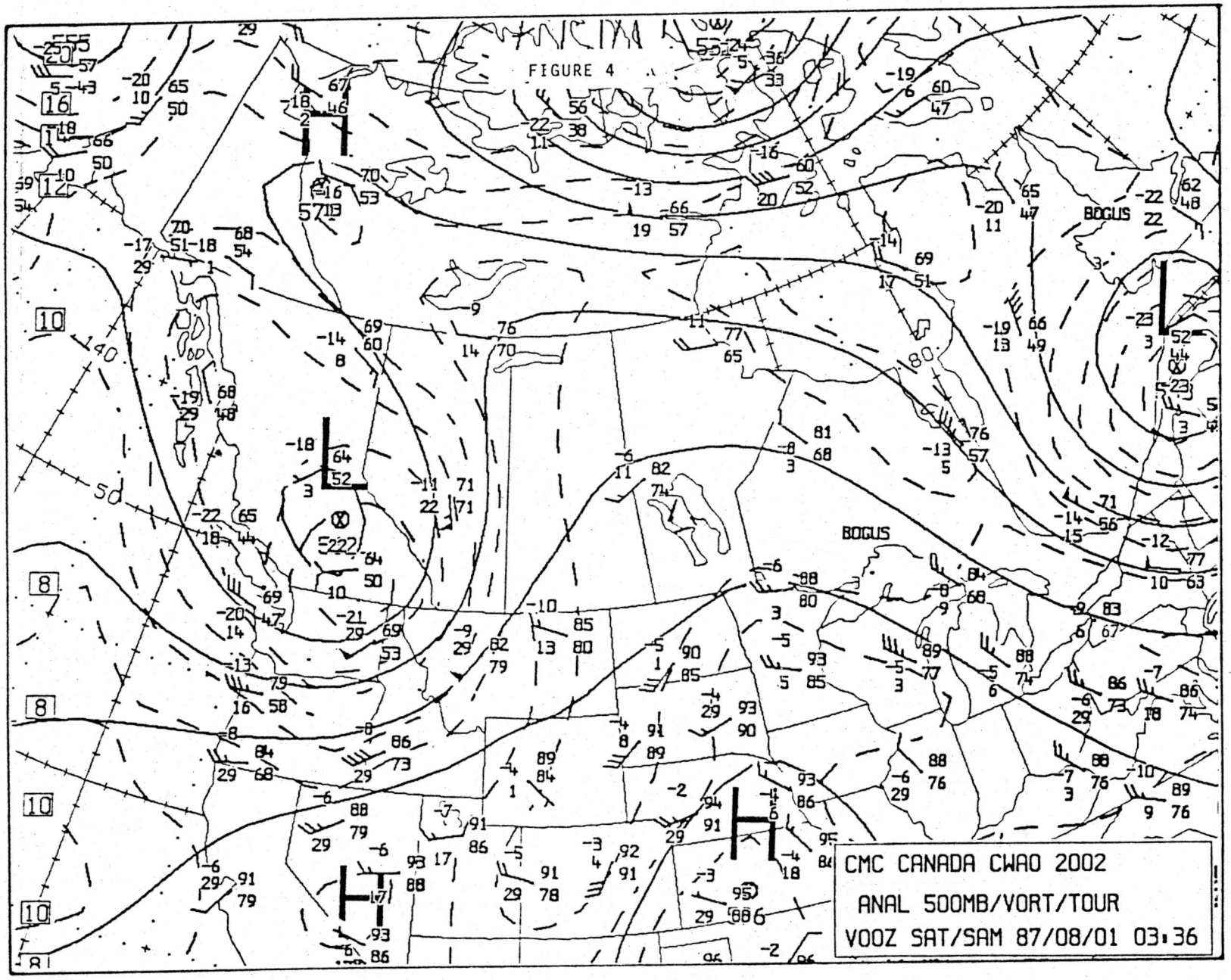
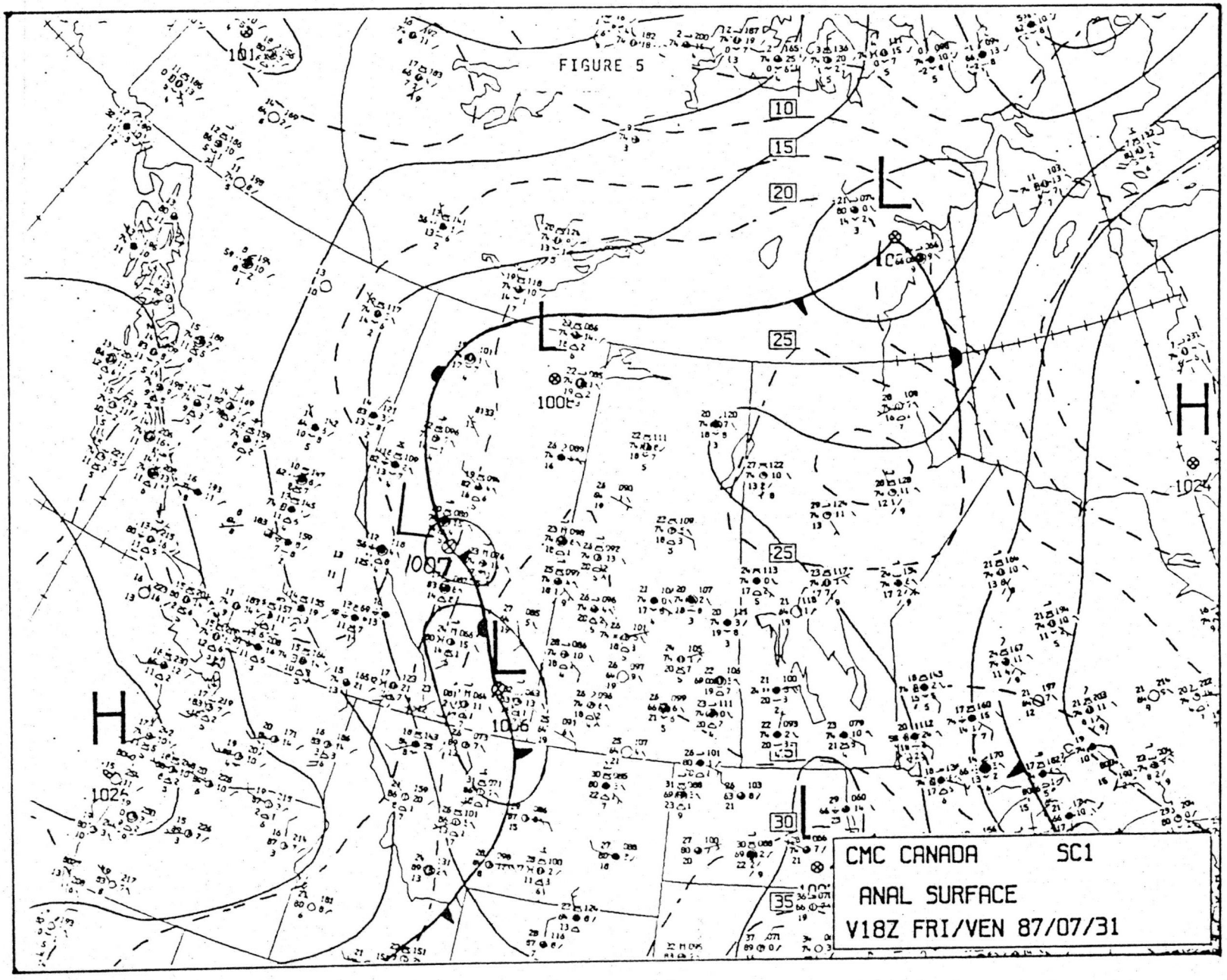
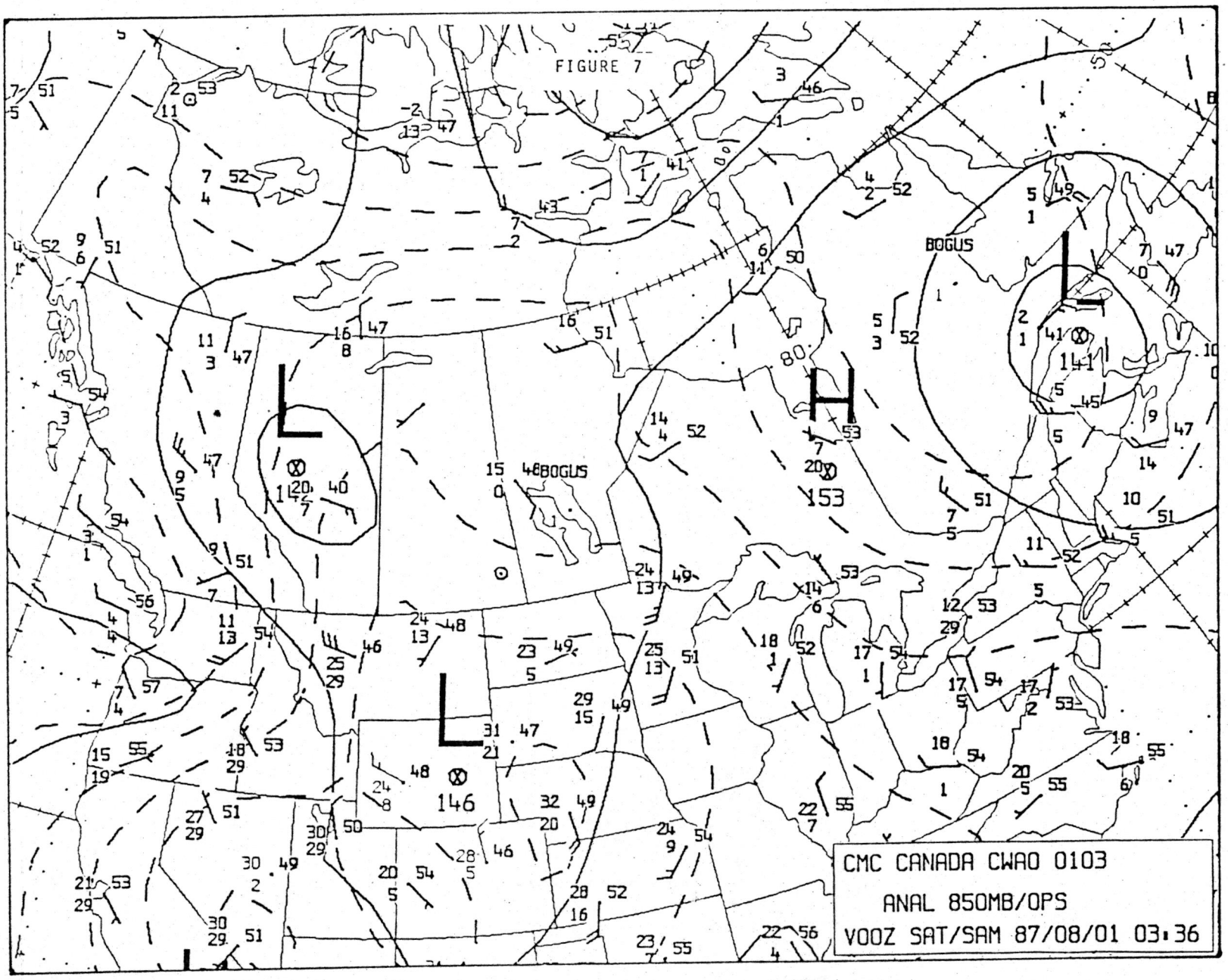


FIGURE 4
BOGUS
BOGUS
CMC CANADA CWAO 2002
ANAL 500MB/VORT/TOUR
VOOZ SAT/SAM 87/08/01 03:36

FIGURE 5

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BOGUS
BOGUS
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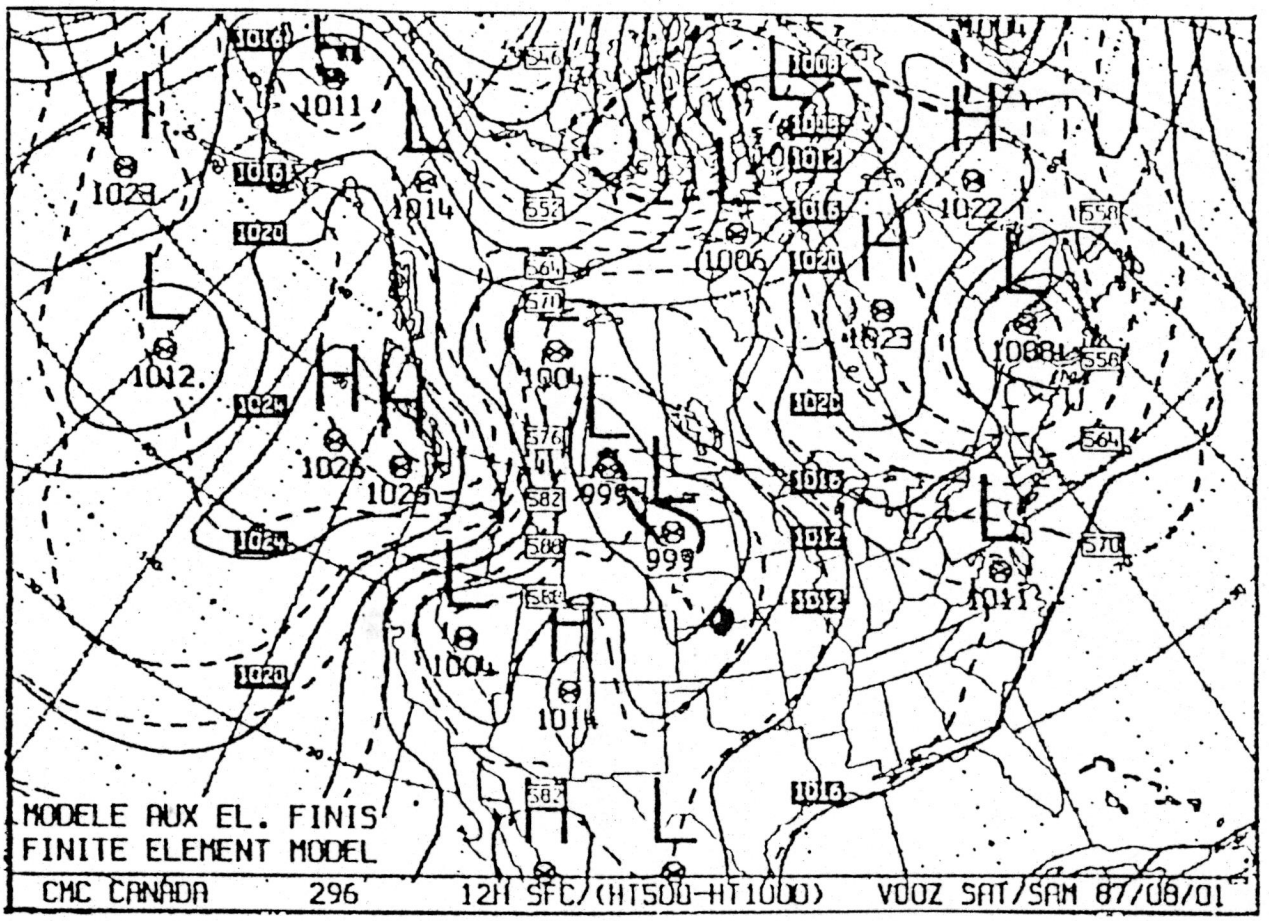
ANAL 850MB/OPS
VOOZ SAT/SAM 87/08/01 03:36

FIGURE 8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FINITE ELEMENT MODEL
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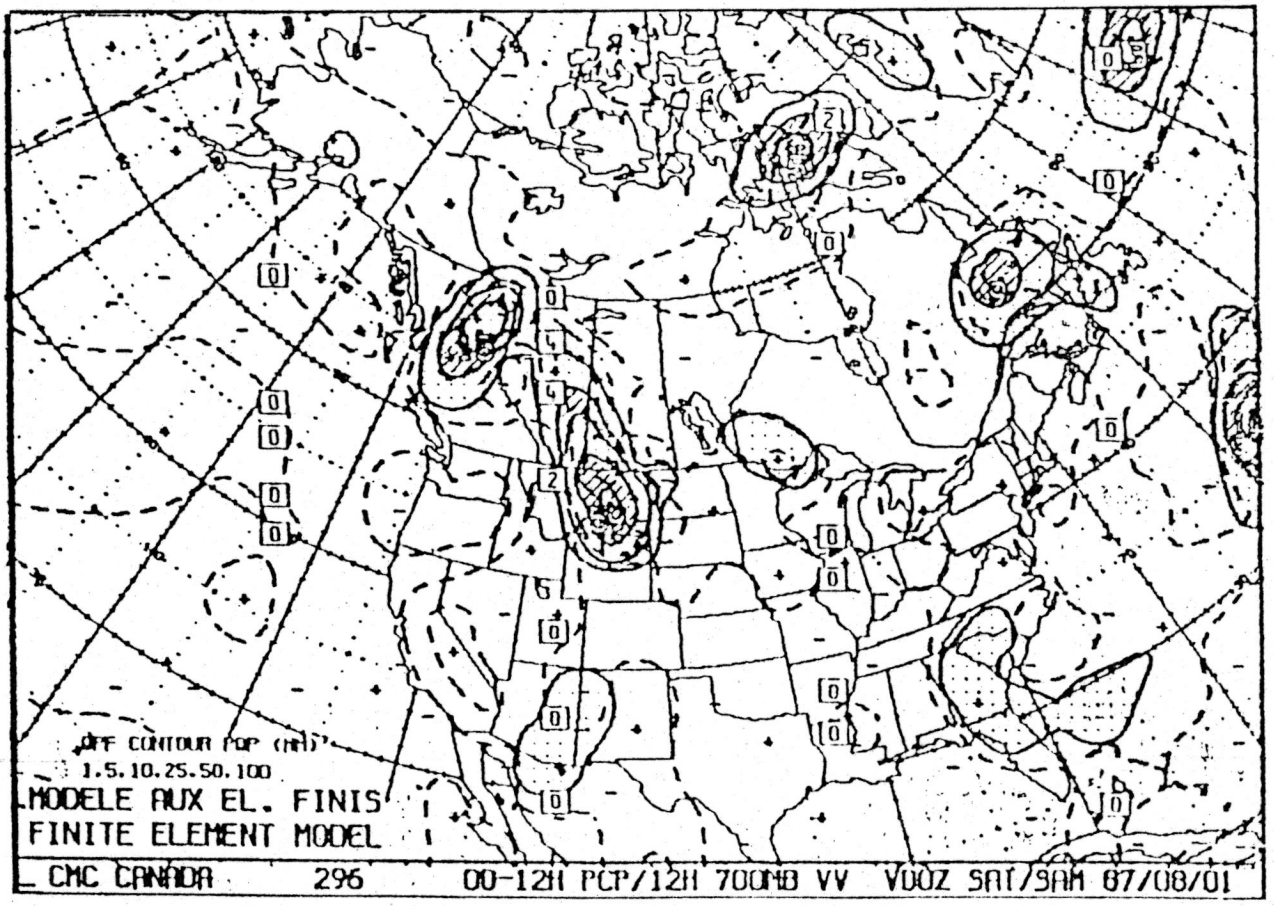

OFF CONTOUR PCP (MM)
1.5.10.25.50.100
MODELE AUX EL. FINIS
FINITE ELEMENT MODEL
CMC CANADA 296 00-12H PCP/12H 700MB VV V00Z SAT/SAM 87/08/01

FIGURE 9

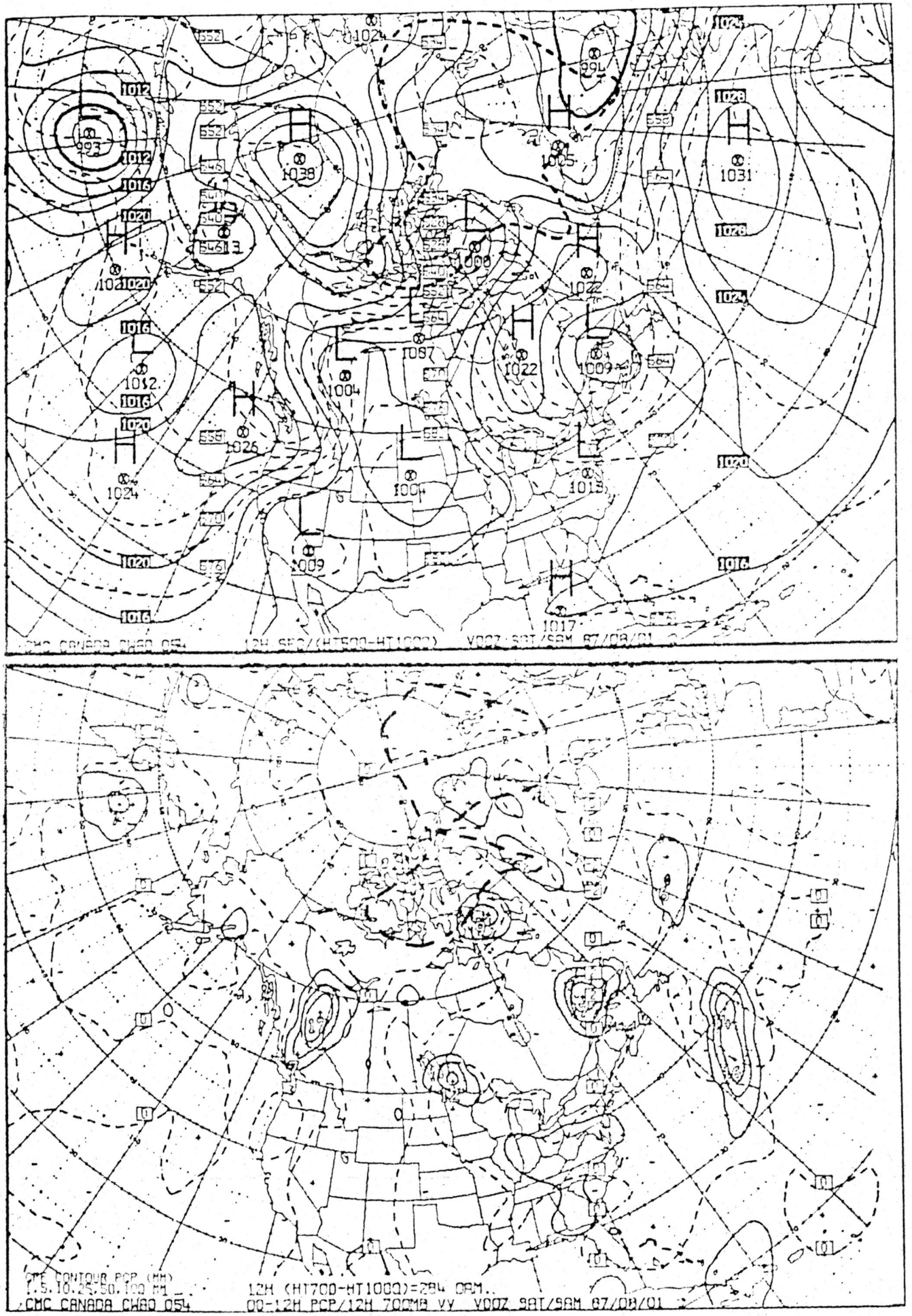

1024
1012
1016
1020
1028
1031
1038
1022
1009
1004
1013
1017
1026
1012
1024
1020
1016
1028
1024
1020
1016
CMC CANADA CWAO 054
12H SFC/(HT500-HT1000)
CMC CONTOUR PCP (MM)
1.5.10.25.50.100 MM
12H (HT700-HT1000)=284 DAM
00-12H PCP/12H 700MB VV
CMC CANADA CWAO 054

FIGURE 10

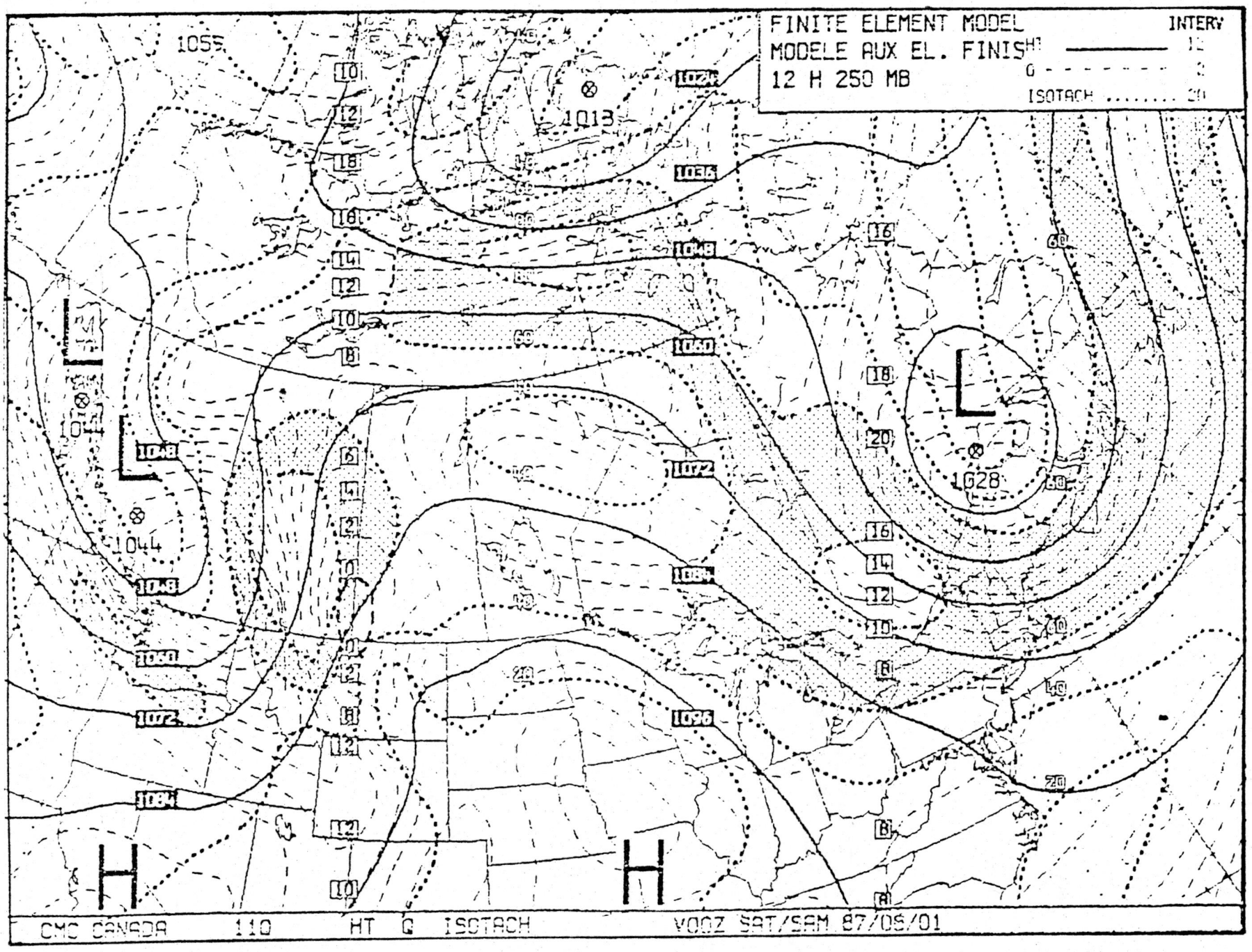

FINITE ELEMENT MODEL
MODELE AUX EL. FINIS
12 H 250 MB
ISOTACH
1055
1013
1028
1044
CMC CANADA 110 HT G ISOTACH V002 SAT/SAM 87/08/01

FIGURE 11

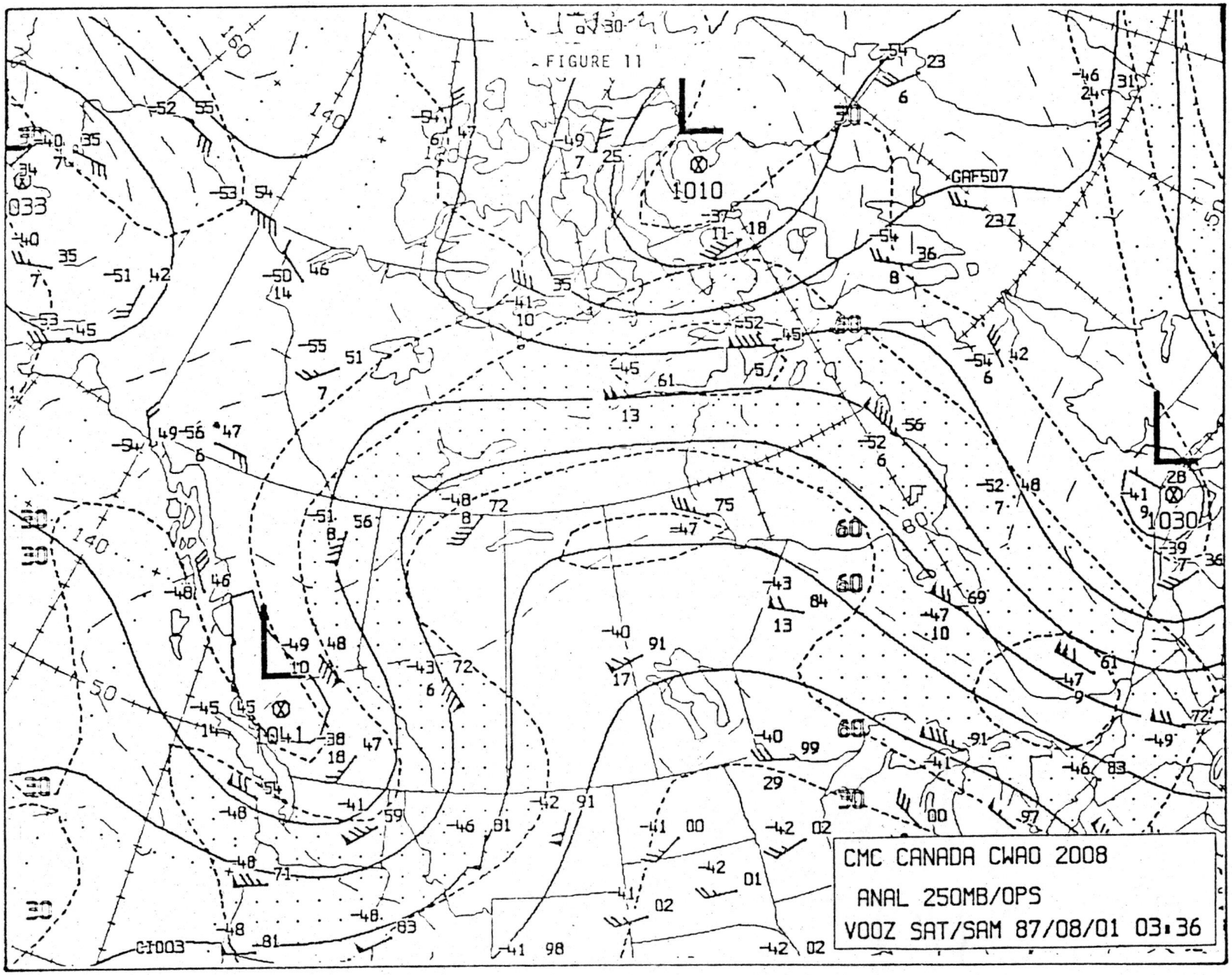


FIGURE 11
1010
1030
GAF507
CMC CANADA CWAO 2008
ANAL 250MB/OPS
VOOZ SAT/SAM 87/08/01 03:36

FIGURE 13

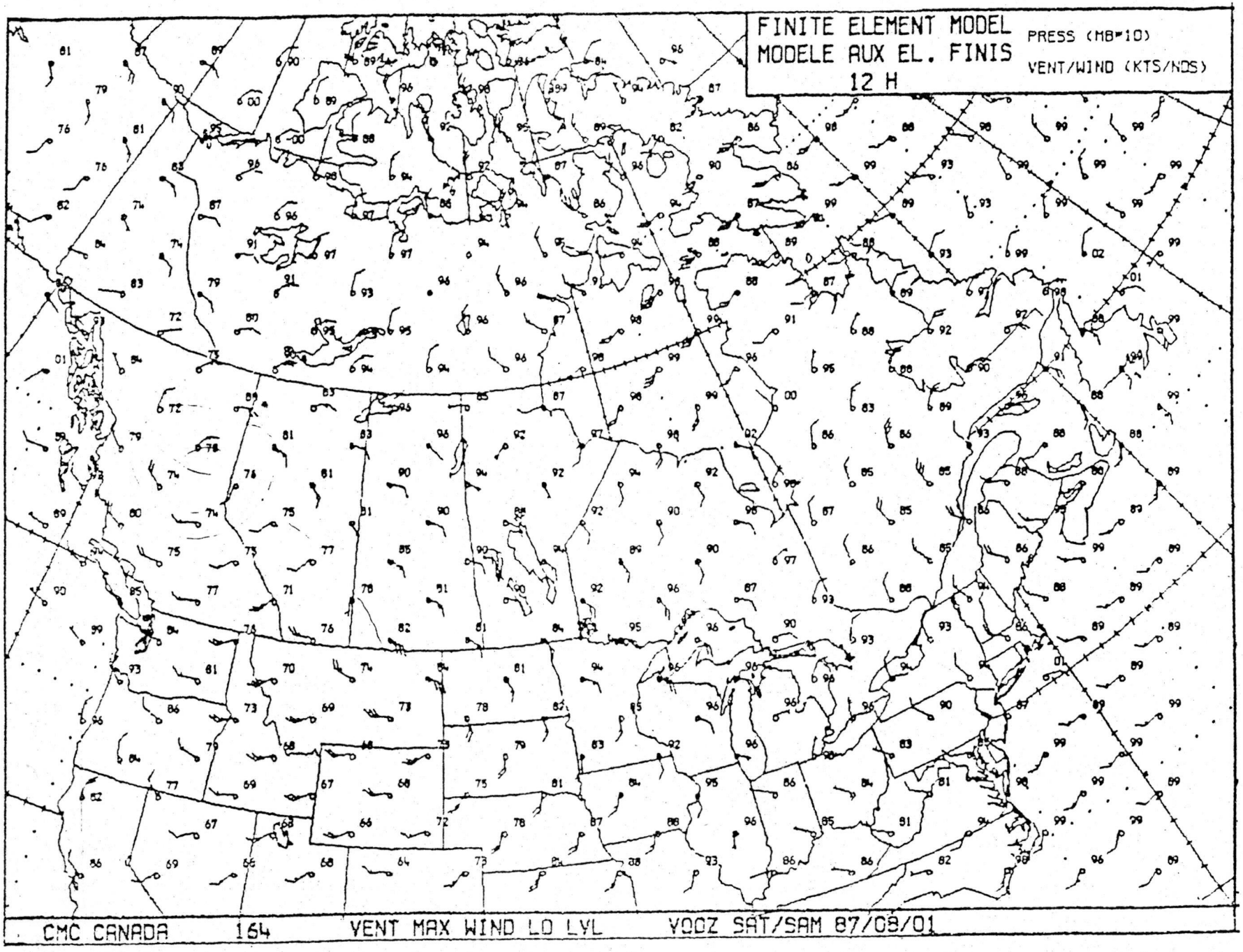

FINITE ELEMENT MODEL
MODELE AUX EL. FINIS
12 H
PRESS (MB-10)
VENT/WIND (KTS/NDS)
CMC CANADA 164 VENT MAX WIND LO LVL YOOZ SAT/SAM 87/08/01

FIGURE 14

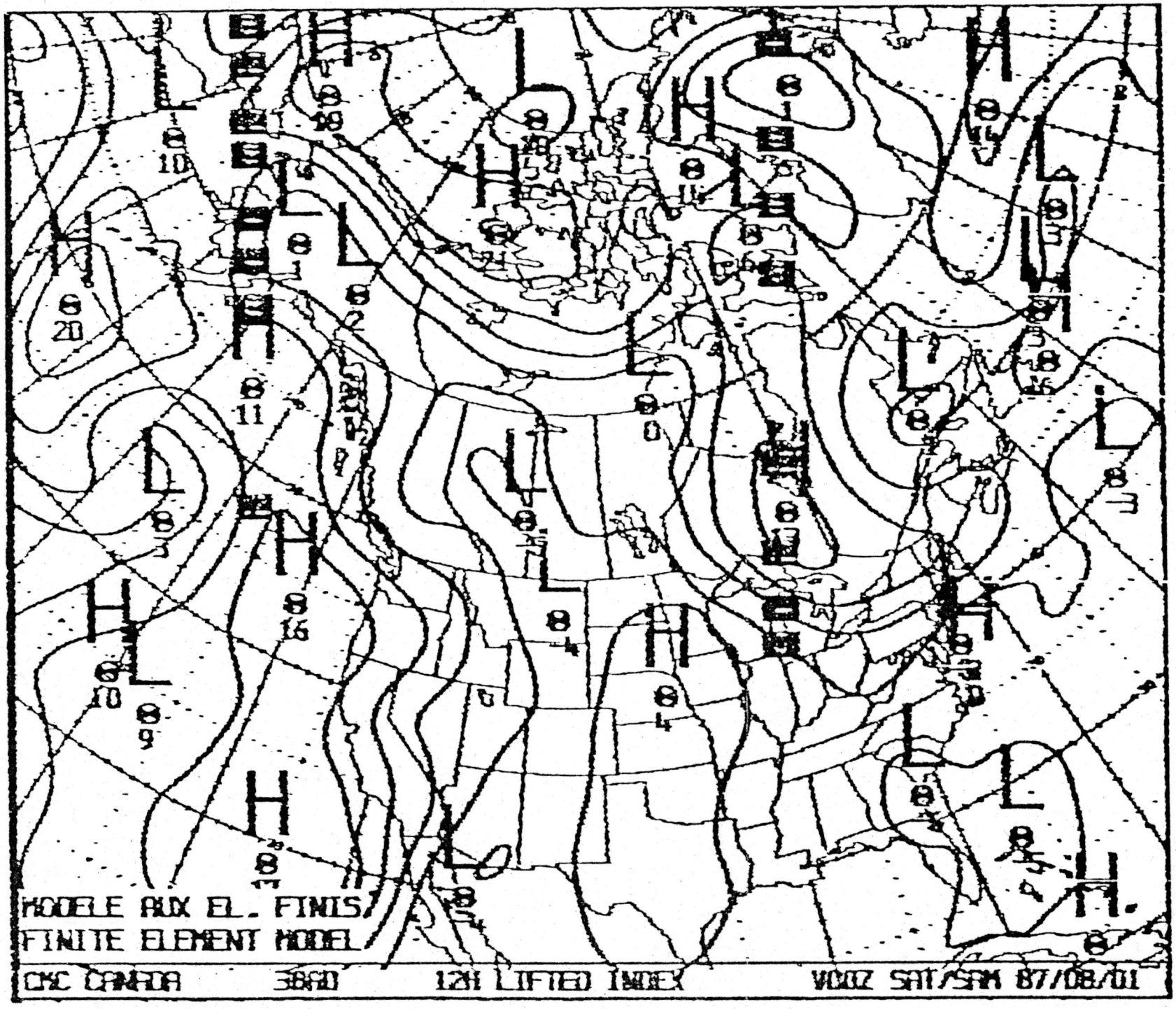
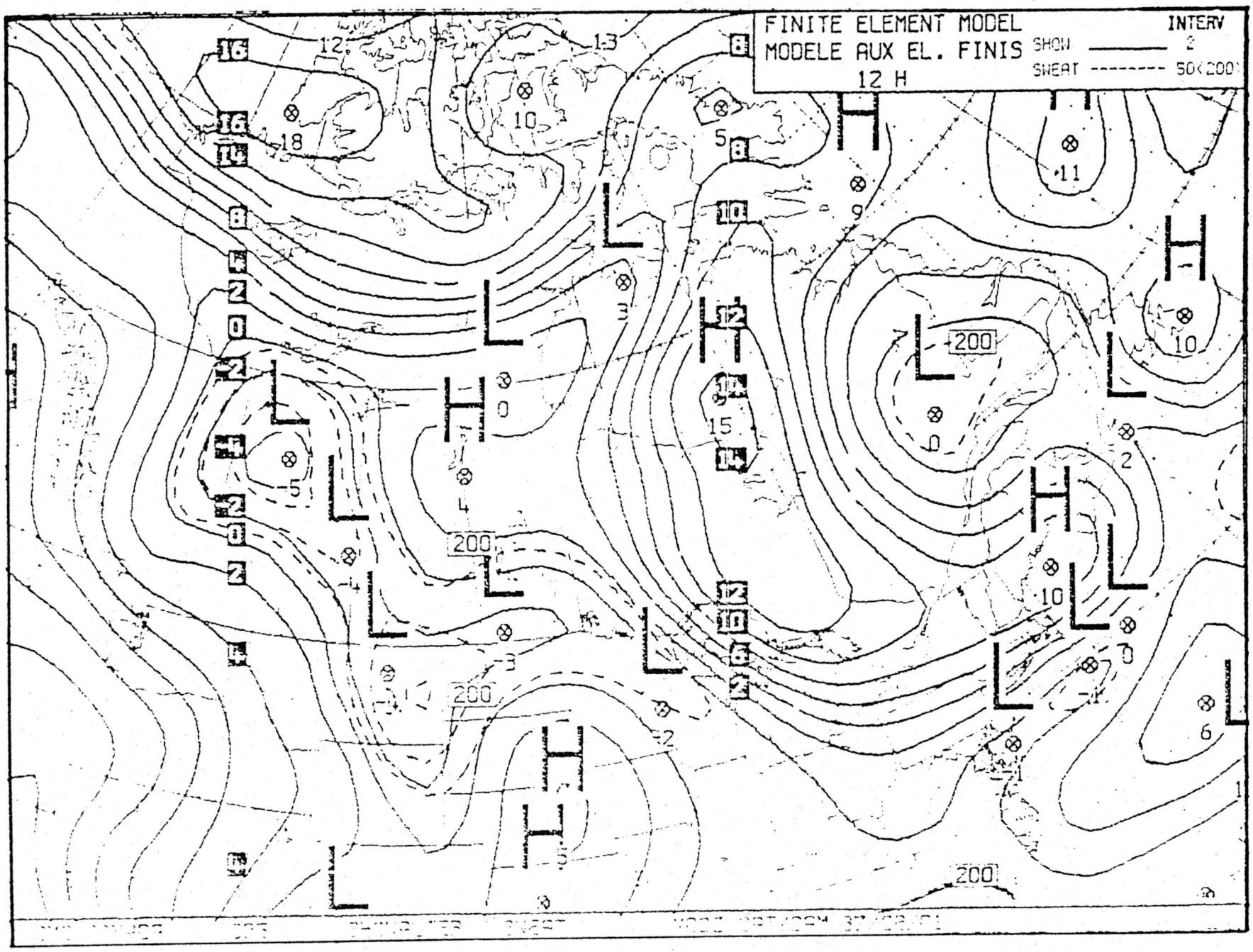

MODELE AUX EL. FINIS/
FINITE ELEMENT MODEL
CMC CANADA
3840
12H LIFTED INDEX
VOOZ SAT/SAM 87/08/01

FIGURE 15


FINITE ELEMENT MODEL
MODELE AUX EL. FINIS
12 H
INTERV
SHOW 2
SWEAT 50<200
200
200
200

TRACK OF THE EDMONTON TORNADO
FRIDAY, JULY 31, 1987
SUMMARY OF PRELIMINARY REPORT

During the afternoon of Friday, July 31, 1987, eastern Edmonton and adjoining communities were struck by a devastating tornado. It caused 27 deaths, hundreds of injuries and over $250 million in property damage.

The first report of a tornado was received from the public at 2:59 p.m. MDT. The initial touch-down was brief with minimal damage. About 3:01 p.m. the tornado again contacted the ground and damage surveys indicate it was a continuous event until its dissipation over one hour later.

From its second touch-down southeast of Beaumont at 3:01 p.m. to its dissipation northeast of the Evergreen Trailer Park at 4:05 p.m., the tornado travelled a distance of about 40 km at an average speed of 35 km/h. The damage path varied in width from about 100 m to near 1000 m. The tornado was at its most destructive in the eastern industrial area of Clareview, and the Evergreen Trailer Park. The devastating damage in these districts resulted in the tornado being classified as a strong F3, at times reaching F4 intensity* on the Fujita Tornado Intensity Scale. As well, considerable damage was evident east of Beaumont and in the Millwoods residential area.

Environment Canada had in effect both a Severe Weather Watch (issued 1:40 p.m. MDT) and a Severe Weather Warning (issued 2:45 p.m. MDT) for the City of Edmonton and surrounding counties. After receiving the first report of a tornado at 2:59 p.m., the Alberta Weather Centre reacted immediately, issuing a Tornado Warning on Weatheradio Canada. The Tornado Warning was transmitted to the media via wire services starting at 3:07 p.m., providing potential advance warning of 18 minutes to individuals in the industrial area and 48 minutes at the Evergreen Trailer Park. These lead times for tornado warnings are considered internationally as state-of-the-art. The Tornado Warning was maintained until 7:00 p.m. when the threat of tornadoes ended.

Alberta has an average of eight tornado sightings per year. Recent large tornadoes were: Athabasca, June 29 1984; Lloydminster, July 8, 1983; and Rocky Mountain House, June 30, 1982.

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* A review of the damage by the University of Chicago classified the tornado F4. Equivalent wind speeds F3: 253 - 330 km/h and F4: 331 - 417 km/h.

Environment Canada
Environnement Canada

TRACK OF THE EDMONTON TORNADO: JULY 31, 1987

PRELIMINARY REPORT

ATMOSPHERIC ENVIRONMENT SERVICE

ENVIRONMENT CANADA

AUGUST 11, 1987

Canada

TRACK OF THE EDMONTON TORNADO: JULY 31, 1987

PRELIMINARY REPORT

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1. Introduction

On July 31, 1987 a devastating tornado struck the City of Edmonton and surrounding communities. Heaviest damage occurred in the eastern sections of the city, with the Evergreen Trailer Park, eastern industrial area and the residential areas of Millwoods and Clareview suffering the most severe destruction. The tornado caused 27 deaths, hundreds of injuries and property damage over $250 million.

This report has been prepared using information gathered in the week following the tornado. The findings should be viewed as preliminary and are subject to adjustments and refinements as more information becomes available.

This preliminary report describes the weather conditions that generated the storm, describes the physical dimensions of the tornado, and outlines the watches and warnings issued by Environment Canada.

The City of Edmonton, Environment Canada, and other agencies concerned with public safety will be co-ordinating a more in-depth review of all matters related to the July 31 tornado.

3. Meteorological Conditions

The last 10 days of July had been hot with temperatures at or near record values. Humidities had been increasing with dewpoints, a measure of humidity, reaching near 20 degrees (10 degrees above normal). Thunderstorms had been frequent during this period, and had necessitated the issuance of a number of severe weather watches and warnings. Damaging winds, large hail, heavy downpours and record lightning activity were associated with the thunderstorms. On Thursday July 30, two lines of severe thunderstorms had crossed the Edmonton region accompanied by damaging winds.

Friday, July 31 dawned sunny, and although surface temperatures and humidities were lower than the previous days, the airmass continued to have the potential for strong thunderstorms. The circulation maintained a southerly flow of warm, moist air. As the day progressed, surface temperatures and dewpoints rose. Thunderstorms began developing in the late morning along the Rocky Mountain Foothills and by early afternoon were moving northward across central Alberta. A cold front was sweeping eastward across Alberta providing an additional lift mechanism for the formation of severe thunderstorms. A line of thunderstorms southwest of Edmonton intensified rapidly and moved toward the city at about 70 km/h. A new thunderstorm cell developed explosively ahead of the line, in the Leduc area, and moved northward. This would prove to be the storm that produced the tornado. The line overtook the cell and together they moved northward through eastern Edmonton. In addition to the tornado, hail as large as softballs, strong winds and rain amounts of 40 - 50 millimetres were reported in the city. Approximately two hours after the first thunderstorms, a second line moved through the city, again producing heavy rain, hail and damaging winds (greater than 110 km/h).

5. The Tornado

The information on the physical aspects of the tornado is based on a synthesis of eyewitness reports, ground surveys and an aerial survey by Brian Smith of the University of Chicago. Adjustments may be made to the conclusions regarding timing and damage path as more information is received.

A tornado was sighted near Leduc at 2:55 P.M. by a member of the public when a funnel cloud was seen to touch down and then retract. According to eyewitness accounts, the tornado reformed southeast of Beaumont at 3:01 P.M. The tornado then followed a generally northward track moving to the east of Beaumont, across the eastern fringes of Millwoods, northward to the Sherwood Park Industrial Estates, then to the North Saskatchewan River Valley. It followed the river northward, exiting the valley where it curves eastwards. The tornado crossed the northeastern fringes of Clareview. As it crossed 153rd Avenue it moved northeast to the Evergreen Trailer Park, then continued northeastward for about 5 km before dissipating.

The tornado was on the ground for over an hour, from its touchdown at 3:01 P.M., to its dissipation northeast of the Trailer Park just after 4:05 P.M. (Table 2). Based on the damage surveys, there was only one tornadic event with a path length of approximately 40 km and an average speed of near 35 km/h. The damage path varied in width from less than 100 metres (m) to over 1000 m. In the most severely damaged areas, the width of the severe destruction varied from 200 m (Evergreen Trailer Park) to about 700 m (industrial sections).

Surveys of the damage led to this tornado being tentatively classified as a strong F3 on the Fujita Tornado Intensity Scale (Table 1). Along the path of the tornado (Map 1) varying scales of damage were visible, ranging from F0 to occasionally approaching F4. Occurrences of missile damage were evident in many areas.

severe damage, steel girders were twisted, and train cars were derailed. As the tornado moved across the CNR tracks east of the Imperial Oil Refinery, it weakened to F2 and was likely F1 or less as it moved into the river valley near the Strathcona Science Park.

Clareview: 1540 - 1555 hrs MDT. (Map 5)

The tornado then paralleled the river valley at FO-F1 strength, causing moderate tree damage. The tornado followed the river valley east of Clareview. Roof damage was evident east of 24 St. between 120 Ave. and 137 Ave., tree damage and some structural damage was evident in Hermitage Park and a drive-in theatre was destroyed near 24 St/137 Ave. (F1-F2). The greatest devastation occurred along 19 St. between 145 and 147 Ave. where 3 houses (two-storey) were completely demolished and many others had considerable damage. At this point the tornado was F3 approaching F4. Just to the east of the destroyed houses, 4 large steel hydro towers were twisted and knocked down. To the west (21 St.) F1 roof damage was evident. The general damage width was again up to 1 km wide, while severe damage was limited to about 300 m. The tornado moved northeast from Clareview around 19 St/153 Ave. and weakened rapidly. Only minor tree damaged (FO) was apparent.

Evergreen Trailer Park: 1555 - 1605 hrs MDT. (Maps 6 and 7)

About 500 m southwest of the Evergreen Trailer Park the tornado once more strengthened (F2-F3) as it struck 3 farms, destroying a mobile home and causing extensive, severe damage to buildings, vehicles and trees. The tornado then devastated the trailer park destroying 133 mobile homes and considerably damaging another 39. Frequent missile damage was observed. The path of total destruction was about 200 m wide during this F3 stage. The tornado left the eastern end of the trailer park about 300 m north of the 1 St/167 Ave. intersection. As it continued northeastward, rapid weakening occurred (FO-F1) and the tornado finally dissipated about 5 km northeast of the trailer park.

7. Summary

Tornadoes occur every year in Alberta. The tornado that devastated portions of eastern Edmonton on July 31, 1987 was, however, a rare event.

Surveys of the damage led to this tornado being tentatively classified as a strong F3 on the Fujita Tornado Intensity Scale. Along the path of the tornado varying scales of damage were visible, ranging from F0 to occasionally as high as F4.

The damage path extended from southeast of Beaumont to northeastern Edmonton over a length of nearly 40 kms. Damage over half of the path indicates a tornado of intensity F2 or stronger. The width of severe destruction varied from 200 m to as much as 700 m.

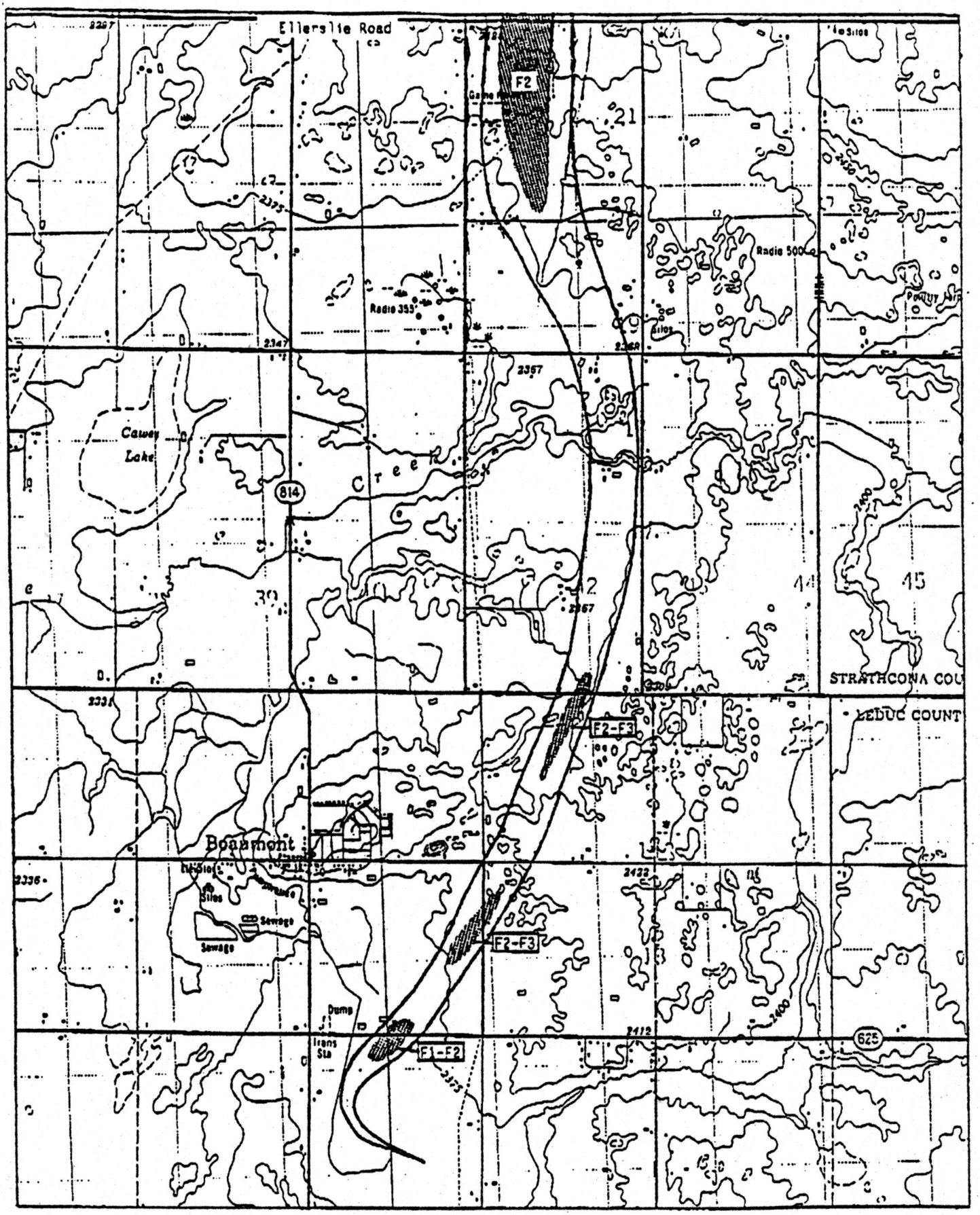
Continued investigations of this tornado and comparisons with other tornadic events in Canadian history, will further define the magnitude of this event.

Table 1. The Fujita Tornado Intensity Scale.

	Surface Wind Speed (km/h)	Expected Damage
F0	64 - 116	Light
F1	117 - 180	Moderate
F2	181 - 252	Considerable
F3	253 - 330	Severe
F4	331 - 417	Devastating
F5	418 - 509	Incredible

Table 2. Tornado Chronology. Based on eyewitness accounts. Times are best estimates available.

Time (hrs/MDT)	Location
1455	First known touchdown in the vicinity of Leduc.
1501	Beginning of the 40 km track, 3-4 km southeast of Beaumont.
1507	1-2 km northeast of Beaumont.
1515	Crossed Ellerslie Road between 34 St. and 17 St.
1520	Moved through southeastern Millwoods.
1530	Northeast of Millwoods.
1535	Moving through Sherwood Park Industrial area.
1540	Moving into the River Valley near the Strathcona Science Park.
1550	Moving through eastern Clareview.
1553	Farms just southwest of Trailer Park hit.
1555	Moving into Evergreen Trailer Park.
1605	Dissipates 5 km northeast of Trailer Park.



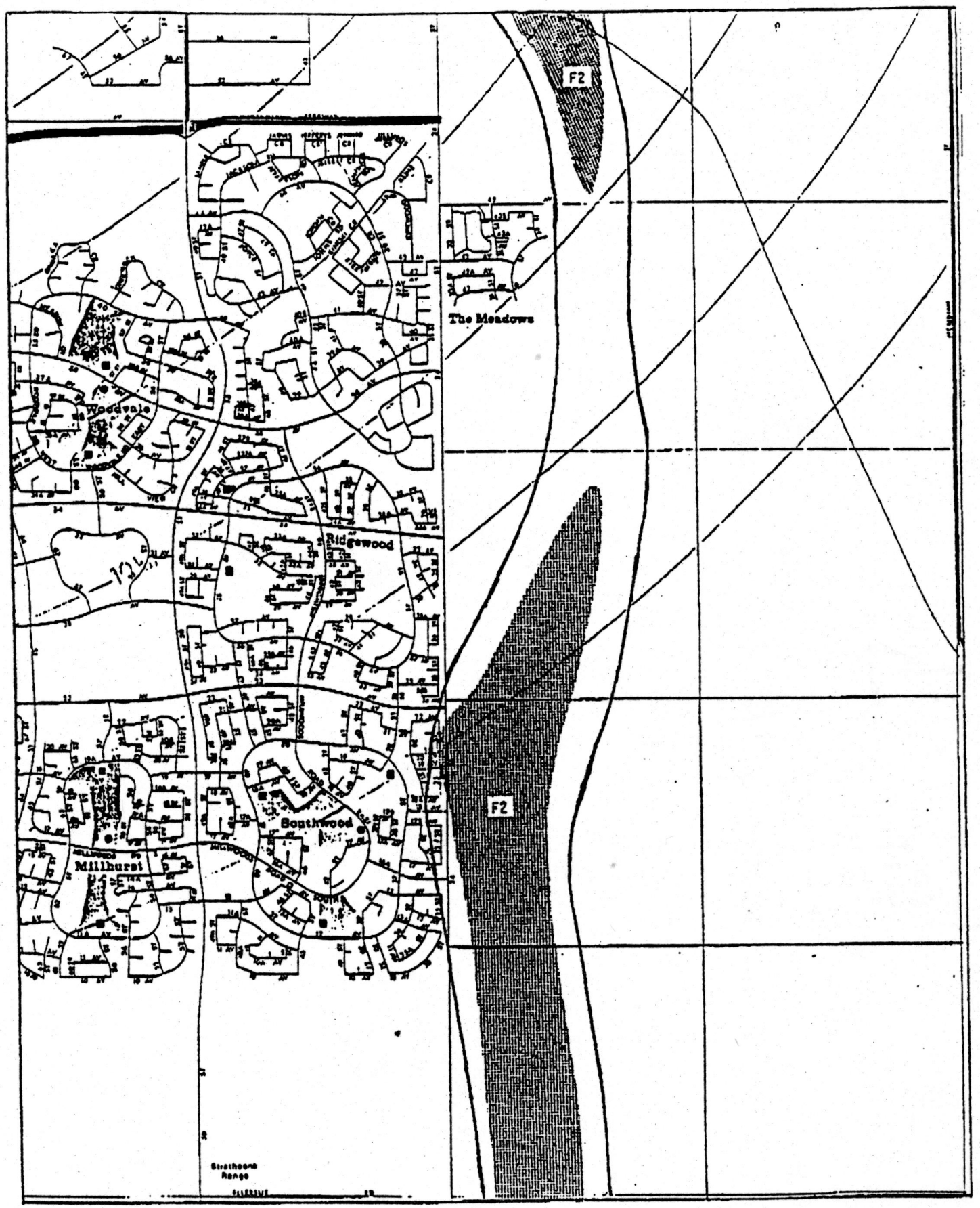
Map 2. Beaumont Area - Ellerslie Road.
Tornado Damage Path, July 31 1987.
Based on aerial and ground surveys.

Considerable or greater Damage

General Damage F0 - F1

Metres 1000 0 1000 2000 3000

FROM EOE RES COMM EDM
8.11.1987 15:42
P. 2

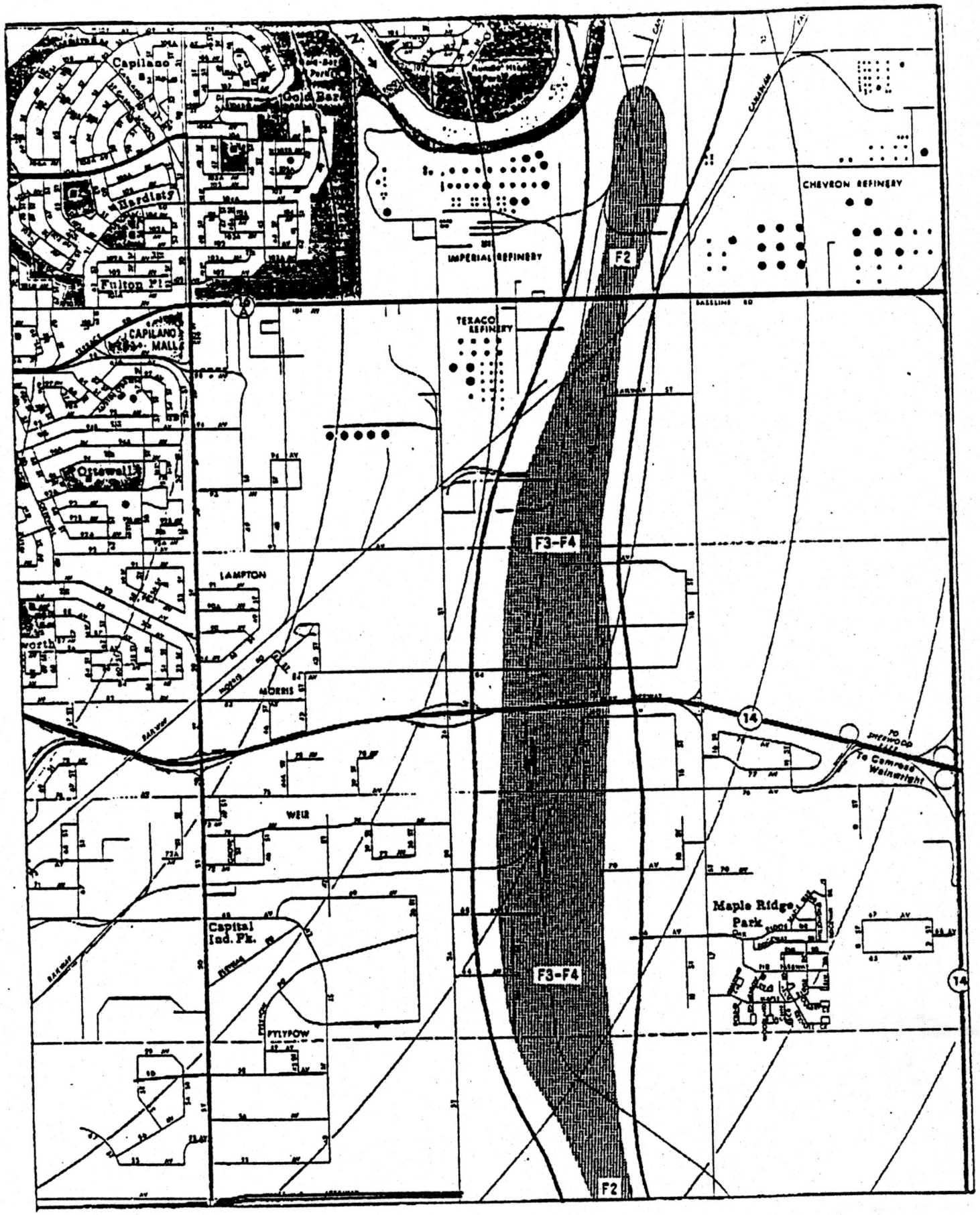


Map 3. Millwoods.
Tornado Damage Path, July 31 1987.
Based on aerial and ground surveys.

Considerable or greater Damage

General Damage F0 - F1

0 1/2 1

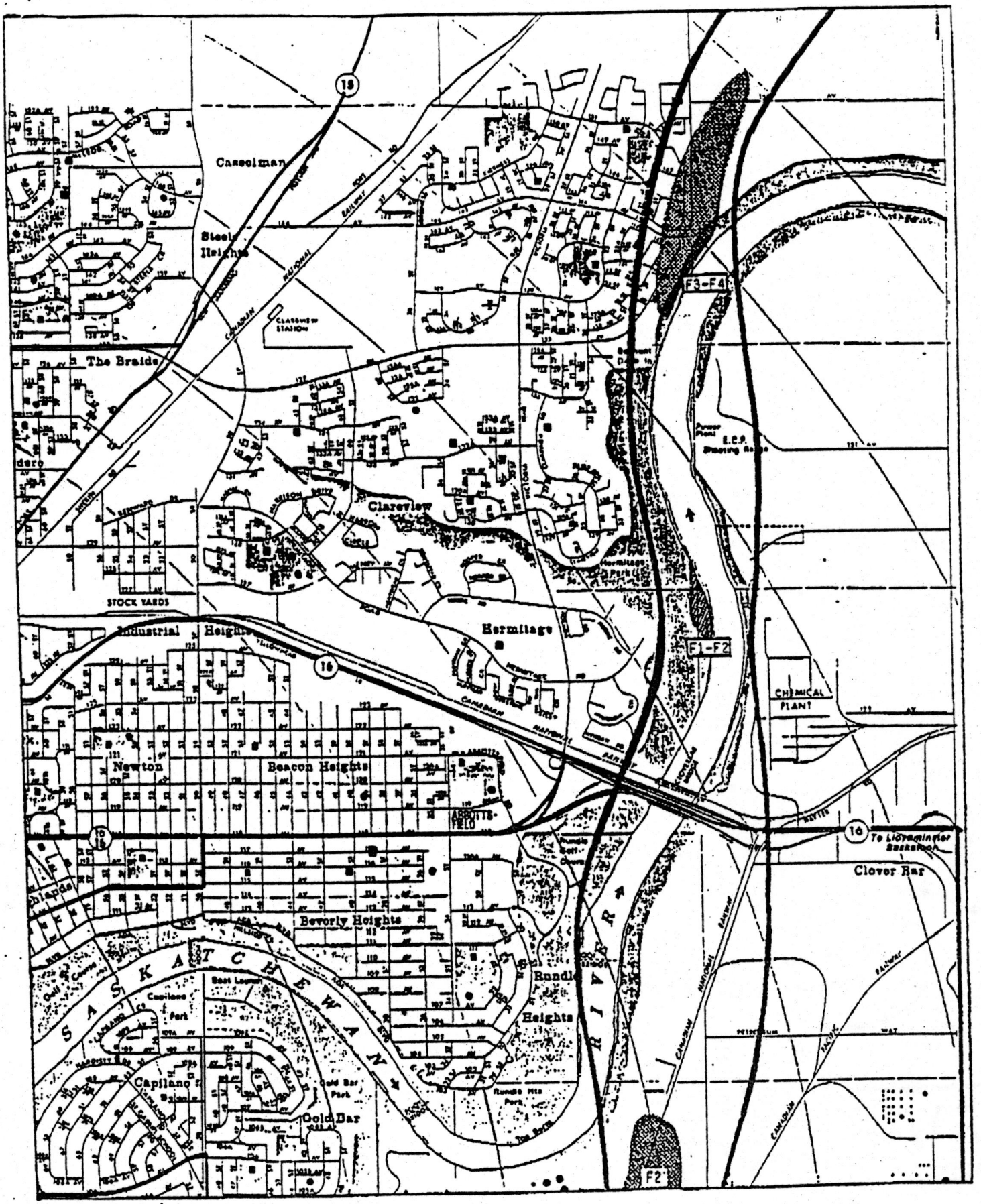


Map 4. Industrial Area.
Tornado Damage Path, July 31 1987.
Based on aerial and ground surveys.

0 1/2 1

Considerable or greater Damage

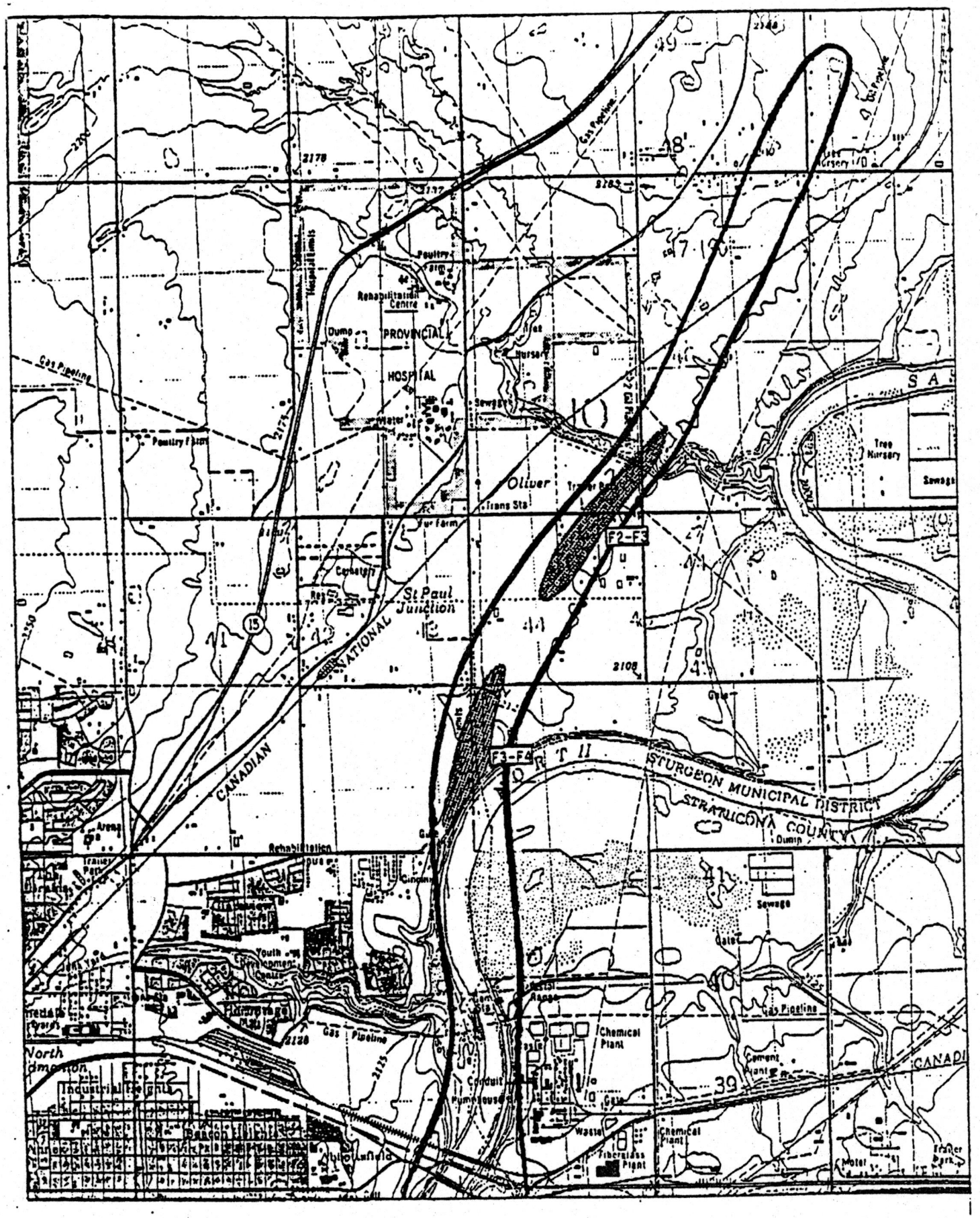
General Damage F0 - F1



Map 5. Clareview.
Tornado Damage Path, July 31 1987.
Based on aerial and ground surveys.

Considerable or greater Damage

General Damage F0 - F1



Map 6. Clareview/Evergreen Trailer Park.
Tornado Damage Path, July 31 1987.
Based on aerial and ground surveys.

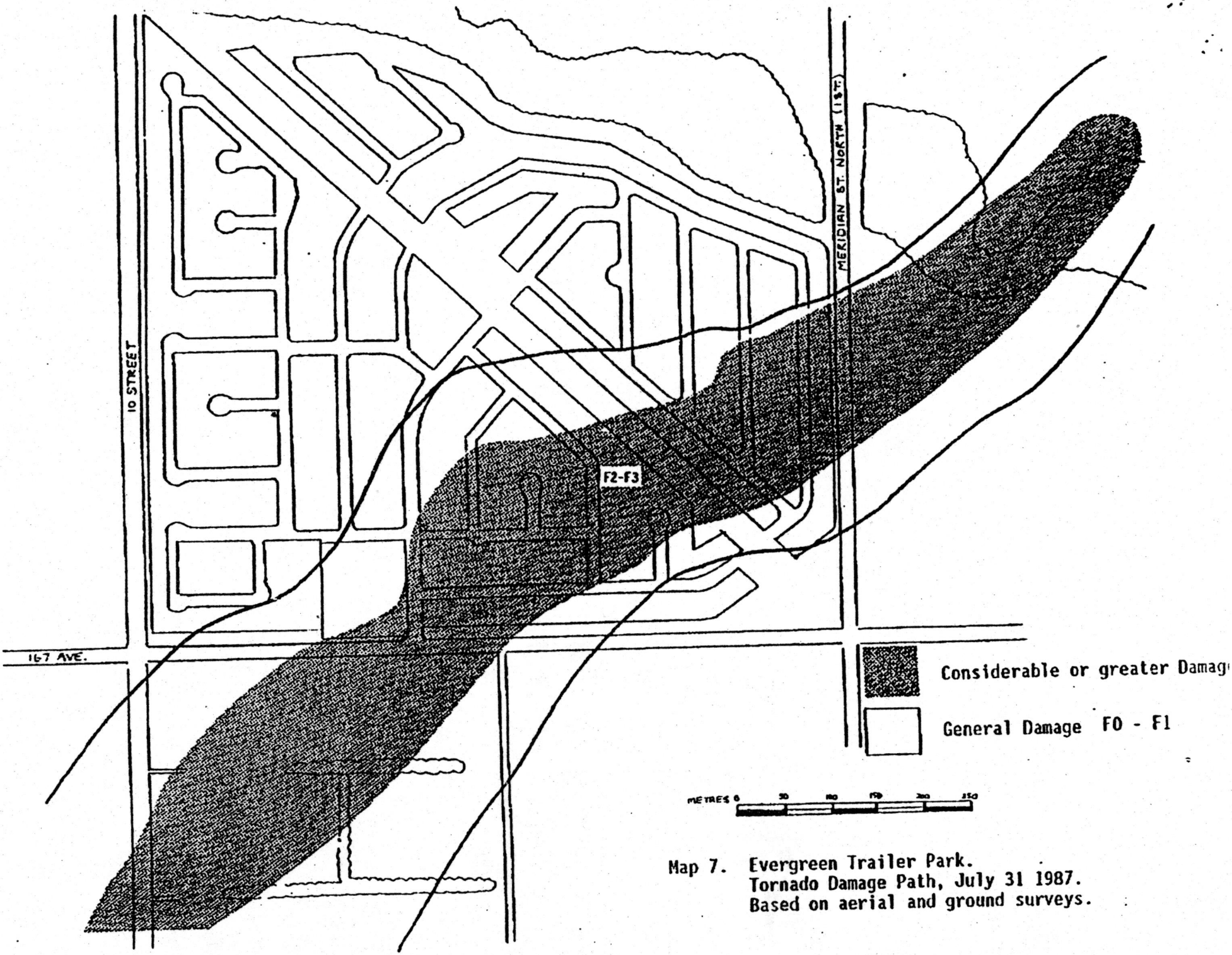
Considerable or greater Damage

General Damage F0 - F1

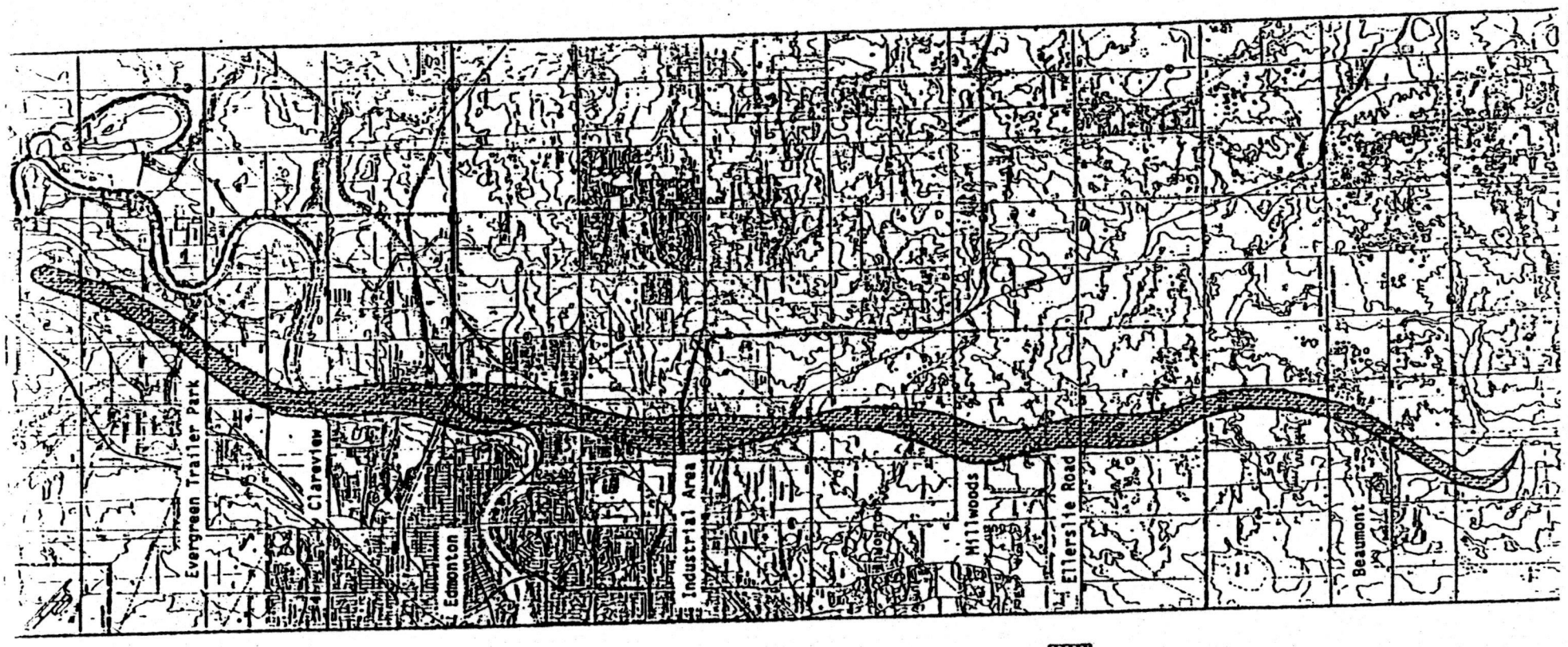
Metres 1000 0 1000 2000 3000

8.11.1987 15:47

FROM EOE AES COMM EDM



Map 7. Evergreen Trailer Park.
Tornado Damage Path, July 31 1987.
Based on aerial and ground surveys.



Map 1. Tornado Damage Path, Edmonton Tornado July 31, 1987.
Based on aerial and ground surveys.

FEATURE

The Edmonton Tornado - July 31, 1987

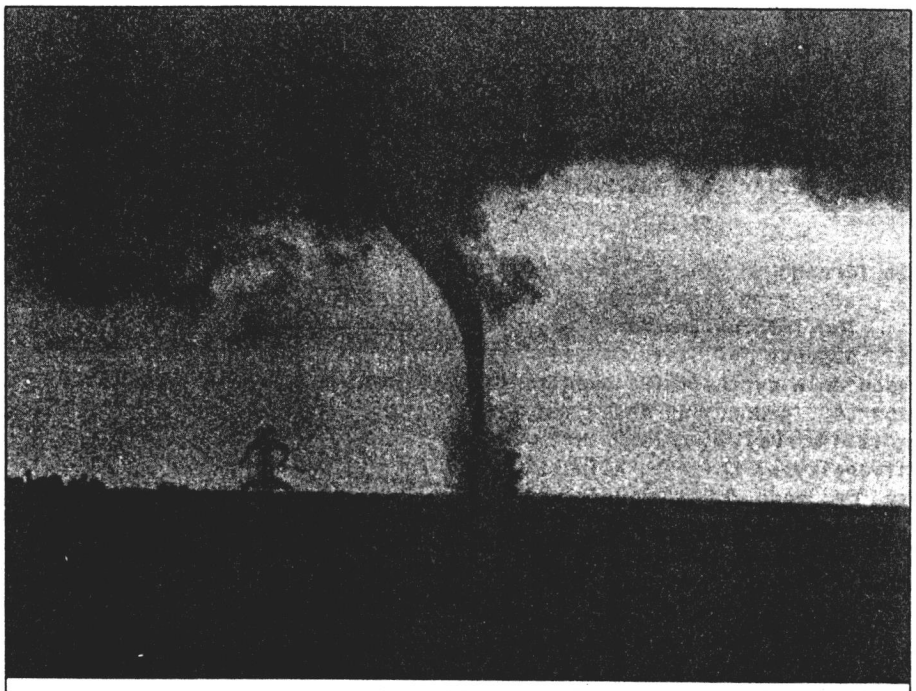
by
A. Wallace, Alberta Weather Centre

On July 31, 1987 a devastating tornado struck the City of Edmonton and surrounding communities. Heaviest damage occurred in the eastern sections of the city, with the Evergreen Trailer Park, eastern industrial area and the residential areas of Millwoods and Clareview suffering the most severe destruction. The tornado caused 27 deaths, hundreds of injuries and property damage over $250 million.

This report has been prepared using information gathered in the week following the tornado. The findings should be viewed as preliminary and are subject to adjustments and refinements as more information becomes available.

This preliminary report describes the weather conditions that generated the storm and describes the physical dimensions of the tornado.

The City of Edmonton, Environment Canada, and other agencies concerned with public safety will be coordinating a more in-depth review of all matters related to the July 31, tornado.



Edmonton Tornado - July 31, 1987 "Touchdown" North-east of Leduc Photo: T. Taylor

Alberta Tornado Climatology

During the period between 1960 and 1982 there was an annual average of 8.3 tornado sightings in Alberta. In the years 1983 through 1986, the number of sightings of tornadoes in Alberta were 17, 12, 15 and 21 respectively. The increase in the numbers of tornado sightings in recent years is believed to stem from a greater awareness of the public and the enhanced reporting network brought about by the recruitment of volunteer weather watchers. In the period 1889 - 1986 there have been seven other documented cases of tornadoes in Edmonton City but these touchdowns were brief and intermittent. (Hage, 1982).

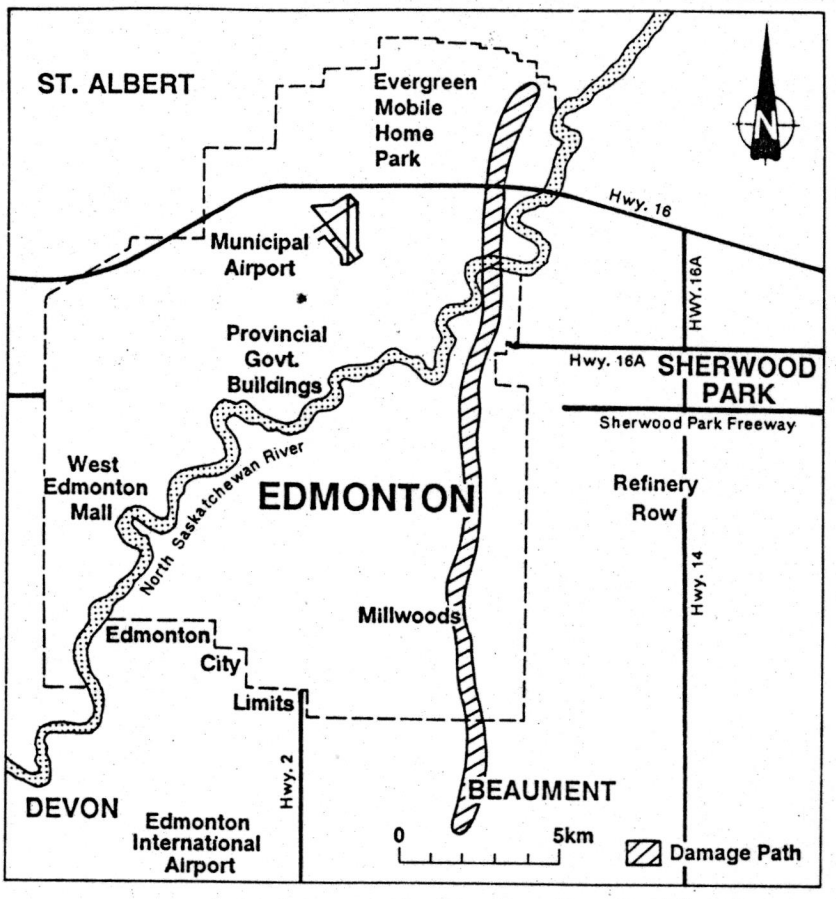
Alberta's tornadoes are of varying intensities. Tornadoes are classified using the Fujita Tornado Intensity Scale (Table 1). Recent major tornadoes to strike Alberta were: Athabasca, June 29, 1984; Lloydminster, July 8, 1983; and, Rocky Mountain House, June 30, 1982.

Meteorological Conditions

The last 10 days of July had been hot with temperatures at or near record values. Humidities had been increasing with dewpoints, a measure of humidity, reaching near 20 degrees (10 degrees above normal). Thunderstorms had been frequent during this period. Damaging winds, large hail, heavy downpours and record lightning activity were associated with the thunderstorms. On July 30, 2 lines of severe thunderstorms had crossed the Edmonton region accompanied by damaging winds.

Friday July 31 dawned sunny, and although surface temperatures and humidities were lower than the previous days the airmass continued to have the potential for strong thunderstorms. The circulation maintained a southerly flow of warm, moist air. As the day progressed, surface temperatures and dewpoints rose. Thunderstorms began developing in the late morning along the Rocky Mountain Foothills and by early afternoon were moving northward across central Alberta. A cold front was sweeping eastward across Alberta providing an additional lift mechanism for the formation of severe thunderstorms. A line of thunderstorms southwest of Edmonton intensified rapidly and moved toward the city at about 70 kmh. A new thunderstorm cell developed explosively ahead of the line, in the Leduc area, and moved northward. This

would prove to be the storm that produced the tornado. The line overtook the cell and together they moved northward through eastern Edmonton. In addition to the tornado, hail as large as softballs, strong winds and rain amounts of 40 - 50 millimetres were reported in the city. Approximately 2 hours after the first thunderstorms a second line moved through the city, again producing heavy rain, hail and damaging winds (greater than 110 kmh).



Map 1. Tornado damage path, Edmonton Tornado July 31, 1987. Based on aerial and ground surveys.

The Tornado

The information on the physical aspects of the tornado is based on a synthesis of eyewitness reports, ground surveys and an aerial survey by Brain Smith of University of Chicago. Adjustments may be made to the conclusions regarding timing and damage path as more information is received.

A tornado was sighted near Leduc at 2:55 P.M. by a member of the public when a funnel cloud was seen to touch down and then retract. According to eyewitness accounts, the tornado reformed southeast of Beaumount at 3:01 P.M. The tornado then followed a generally northward track moving to the east of Beaumont, across the eastern fringes of Millwoods, northward to the Sherwood Park Industrial Estates, then to the North Saskatchewan River Valley. It followed the river northward, exiting the valley where it curves eastwards. The tornado crossed the northeastern fringes of Clareview. As it crossed 153rd Avenue it moved northeast to the Evergreen Trailer Park, then continued northeastward for about 5 km before dissipating.

The tornado was on the ground for over an hour, from its touchdown at 3:01 P.M., to its dissipation northeast of the Trailer Park just after 4:05 P.M. (Table 2). Based on the damage surveys, there was only one tornadic event with a path length of approximately 40 km and an average speed of near 35 kmh. The damage path varied in width from less than 100 metres (m) to over 1000 m. In the most severely damaged areas, the width of the severe destruction varied from 200 m (Evergreen Trailer Park) to about 700 m (industrial sections). Surveys of the damage led to this tornado being tentatively classified as a strong F3 on the Fujita Tornado Intensity Scale (Table 1). Along the path of the tornado (Map 1) varying scales of damage were visible, ranging from F0 to occasionally approaching F4. Occurrences of missile damage were evident in many areas.

Other Severe Weather Phenomena

Very large hail, up to softball size, was reported in south Edmonton and the eastern sections of Edmonton south of the River. Torrential rains accompanied the storm complex across all parts of the City and produced local flooding. Strong and gusty winds together with downbursts from the thunderstorm also caused some damage near to, but not within, the tornado path.

A second line of thunderstorms moved across the city in the early evening. This was accompanied by strong wind gusts (110 kmh reported) and hail.

Summary

Tornadoes occur every year in Alberta. The tornado that devastated portions of eastern Edmonton on July 31, 1987 was however a rare event.

Surveys of the damage led to this tornado being tentatively classified as a strong F3 on the Fujita Tornado Intensity Scale. Along the path of the tornado varying scales of damage were visible, ranging from F0 to occasionally as high as F4.

The damage path extended from southeast of Beaumont to northeastern Edmonton over a length of nearly 40 kms. Damage

over half of the path indicates a tornado of intensity F2 or stronger. The width of severe destruction varied from 200 m to as much as 700 m.

Continued investigations of this tornado and comparisons with other tornadic events in Canadian history, will further define the magnitude of this event.

Reference

Hage, K.D., 1982, Preliminary List of Tornadoes in Alberta 1960 - 1982, Unpublished manuscript.

WHAT TO DO IF A TORNADO STRIKES

1. Head for the basement. Fast!
2. No basement? Seek shelter under the stairs, under a sturdy table, or in a closet or small room.
3. In a school auditorium or shopping mall - seek shelter in an interior corridor.
4. If caught outside, abandon your car and lie flat in a ditch or depression.

Table 1. The Fujita Tornado Intensity Scale

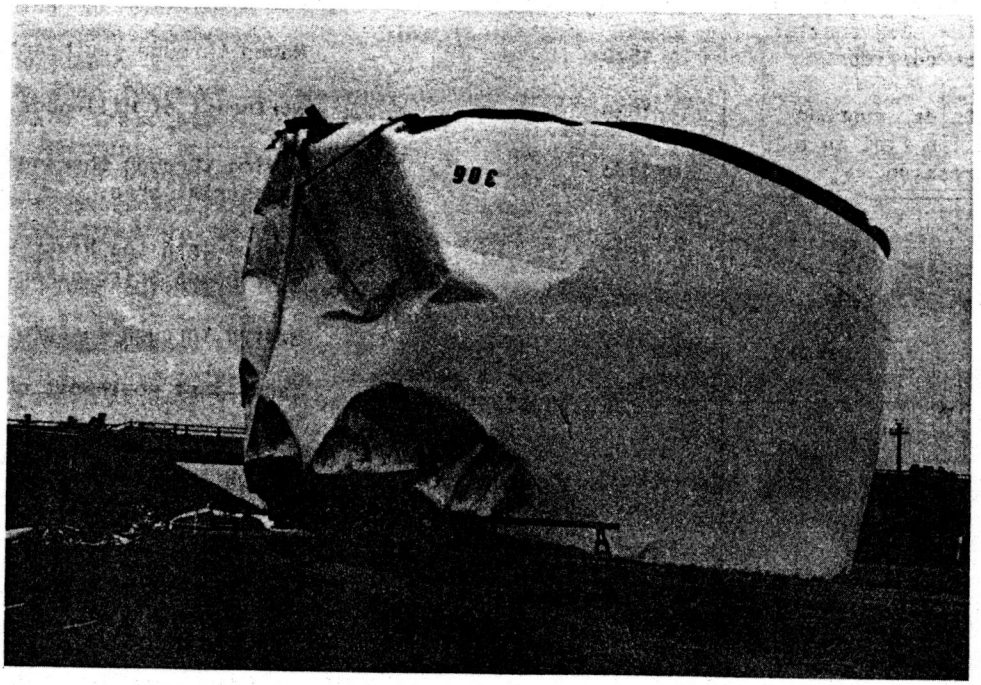
	Surface Wind Speed (kmh)	Expected Damage
F0	64 - 116	Light
F1	117 - 180	Moderate
F2	181 - 252	Considerable
F3	253 - 330	Severe
F4	331 - 417	Devastating
F5	418 - 509	Incredible

Table 2. Tornado Chronology. Based on eyewitness accounts. Times are best estimates available.

local time	Location
1455	First known touchdown in the vicinty of Leduc.
1501	Beginning of the 40 km track, 3-4 km southeast of Beaumount.
1507	1-2 km northeast of Beaumount.
1515	Crossed Ellerslie Road between 34 St. and 17 St.
1520	Moved through southeastern Millwoods.
1530	Northeast of Millwoods.
1535	Moving through Sherwood Park Industrial area.
1540	Moving into the River Valley near the Strathcona Science Park.
1550	Moving through eastern Clareview.
1553	Farms just southwest of Trailer Park hit.
1555	Moving into Evergreen Trailer Park.
1605	Dissipates 5 km northeast of Trailer Park.



Edmonton Tornado - July 31, 1987 Evergreen Trailer Court Photo: L. Wojliw



Edmonton Tornado - July 31, 1987 Industrial Area "Refinery Row" Photo: L. Wojliw

The Edmonton Tornado - July 31, 1987

by
A. Wallace, Alberta Weather Centre

On July 31, 1987 a devastating tornado struck the City of Edmonton and surrounding communities. Heaviest damage occurred in the eastern sections of the city, with the Evergreen Trailer Park, eastern industrial area and the residential areas of Millwoods and Clareview suffering the most severe destruction. The tornado caused 27 deaths, hundreds of injuries and property damage over $250 million.

This report has been prepared using information gathered in the week following the tornado. The findings should be viewed as preliminary and are subject to adjustments and refinements as more information becomes available.

This preliminary report describes the weather conditions that generated the storm and describes the physical dimensions of the tornado.

The City of Edmonton, Environment Canada, and other agencies concerned with public safety will be coordinating a more in-depth review of all matters related to the July 31, tornado.



Edmonton Tornado - July 31, 1987 "Touchdown" Northeast of Leduc Photo: T. Taylor

Alberta Tornado Climatology

During the period between 1960 and 1982 there was an annual average of 8.3 tornado sightings in Alberta. In the years 1983 through 1986, the number of sightings of tornadoes in Alberta were 17, 12, 15 and 21 respectively. The increase in the numbers of tornado sightings in recent years is believed to stem from a greater awareness of the public and the enhanced reporting network brought about by the recruitment of volunteer weather watchers. In the period 1889 - 1986 there have been seven other documented cases of tornadoes in Edmonton City but these touchdowns were brief and intermittent. (Hage, 1982).

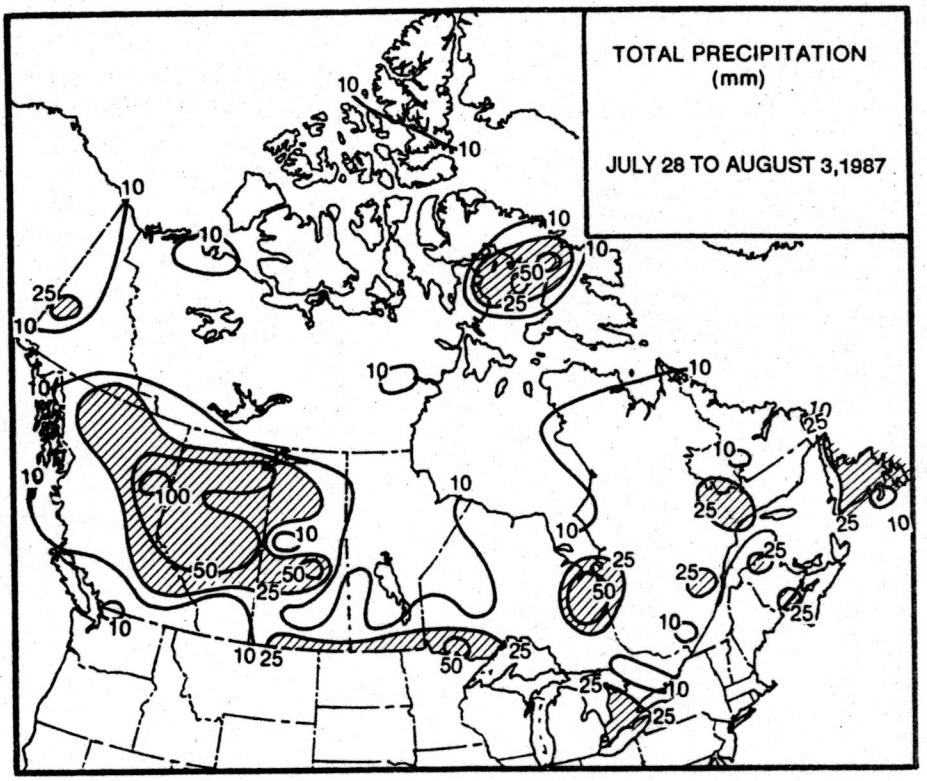
Alberta's tornadoes are of varying intensities. Tornadoes are classified using the Fujita Tornado Intensity Scale (Table 1). Recent major tornadoes to strike Alberta were: Athabasca, June 29, 1984; Lloydminster, July 8, 1983; and, Rocky Mountain House, June 30, 1982.

Meteorological Conditions

The last 10 days of July had been hot with temperatures at or near record values. Humidities had been increasing with dewpoints, a measure of humidity, reaching near 20 degrees (10 degrees above normal). Thunderstorms had been frequent during this period. Damaging winds, large hail, heavy downpours and record lightning activity were associated with the thunderstorms. On July 30, 2 lines of severe thunderstorms had crossed the Edmonton region accompanied by damaging winds.

Friday July 31 dawned sunny, and although surface temperatures and humidities were lower than the previous days the airmass continued to have the potential for strong thunderstorms. The circulation maintained a southerly flow of warm, moist air. As the day progressed, surface temperatures and dewpoints rose. Thunderstorms began developing in the late morning along the Rocky Mountain Foothills and by early afternoon were moving northward across central Alberta. A cold front was sweeping eastward across Alberta providing an additional lift mechanism for the formation of severe thunderstorms. A line of thunderstorms southwest of Edmonton intensified rapidly and moved toward the city at about 70 kmh. A new thunderstorm cell developed explosively ahead of the line, in the Leduc area, and moved northward. This

PRECIPITATION



Ontario

Stormy weather marred Ontario's Simcoe Day on August 3rd as late evening thunderstorms destroyed over 200 trees and damaged several cottages near Gogama, 75 km south of Timmins. Funnel clouds were sighted near Sault Ste. Marie although no touchdowns were confirmed. Structural damage to several buildings was reported on August 2nd near Sarnia where thunderstorm winds were estimated at 100-110 kmh. The heat is being blamed for poor quality and low quantity summer apples and raspberries in southwestern Ontario, but the Niagara peach crop looks promising.

Quebec

It was a rather cool and dry week across the province. According to the weather office at Sherbrooke, some eastern township locations reported ground frost on the 28th. On the same date, the mercury dropped to 1°C at Val-d'Or. The forest fire situation has been near normal so far this year.

Atlantic Provinces

Temperatures were on the cool side in the Maritimes with showers and thunderstorms bringing relief to some of the drier areas. A funnel cloud sighting was reported at Summerside on P.E.I. and a waterspout was seen from the Iles de la Madelaine airport in Quebec on August 1st. Cooler, wetter weather moved into Newfoundland at the end of the period permitting a partial lifting of the ban on forestry operations in the province.

HEAVIEST WEEKLY PRECIPITATION (mm)

BRITISH COLUMBIA	FORT ST.JOHN	113
YUKON TERRITORY	DAWSON	31
NORTHWEST TERRITORIES	DEWAR LAKES	54
ALBERTA	GRANDE PRAIRIE	78
SASKATCHEWAN	PRINCE ALBERT	66
MANITOBA	GIMLI	39
ONTARIO	MOOSONEE	60
QUEBEC	NATASHQUAN	40
NEW BRUNSWICK	CHARLO	30
NOVA SCOTIA	SHEARWATER	23
PRINCE EDWARD ISLAND	CHARLOTTETOWN	13
NEWFOUNDLAND	ST JOHN'S	31

Edmonton Tornado Leaves a Trail of Death and Destruction

by Mike Skarpathiotakis

Furious tornadoes hopped an erratic path of 30 km through the eastern parts of Edmonton, Alberta on Friday, July 31. Twenty-six people were killed and hundreds of others were injured. There was complete devastation to properties in the path of the tornadoes with the most tragic damage being done to the Evergreen Trailer Park. The awesome force of the tornadoes toppled transmission towers, blew a giant oil storage tank 300 metres, hurled cars like toys and uprooted trees. The Alberta Weather Centre had been monitoring swelling thunderstorms all day, sending out numerous advisories which were continuously upgraded to a tornado alert. As the funnel cloud swept by, the office lost power and the Prairie Weather Centre took control of forecast duties. Tornadoes are very rare in Alberta and this event has been the 2nd worst natural disaster in Canada (Hurricane Hazel killed 81 people in Ontario in 1954) and the most costly, with losses estimated at 150 million dollars.

0998723 A ✓ F=4

TORNADO PROJECT SUMMARY SHEET

1. DATE AND TIME July 31, 1987 1455 MDT

2. LOCATION OR PATH (attach map) Edmonton, Alta.

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

4. PATH WIDTH 500 Avg 1000m Max 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;
7) Large and black.

9. LIST ANY ASSOCIATED PHENOMENA (Such as hail, vivid lightning heavy rain, no rain, etc.) — upto softball sized hail — heavy rain.

10. TOTAL DAMAGE ESTIMATE $ 250 000 000 11. TOTAL DEATHS 27

12. TOTAL INJURED 300 13. TOTAL HOMELESS 400 families

14. LIST ALL REFERENCES

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

a) travelled at average speed of < 35 km/h, multiple funnels sighted at some locations.

b) Houses completely demolished; industrial buildings demolished; cars, trucks, railway cars, and mobile homes picked up and carried. Large oil storage tank picked up and dropped upside down.

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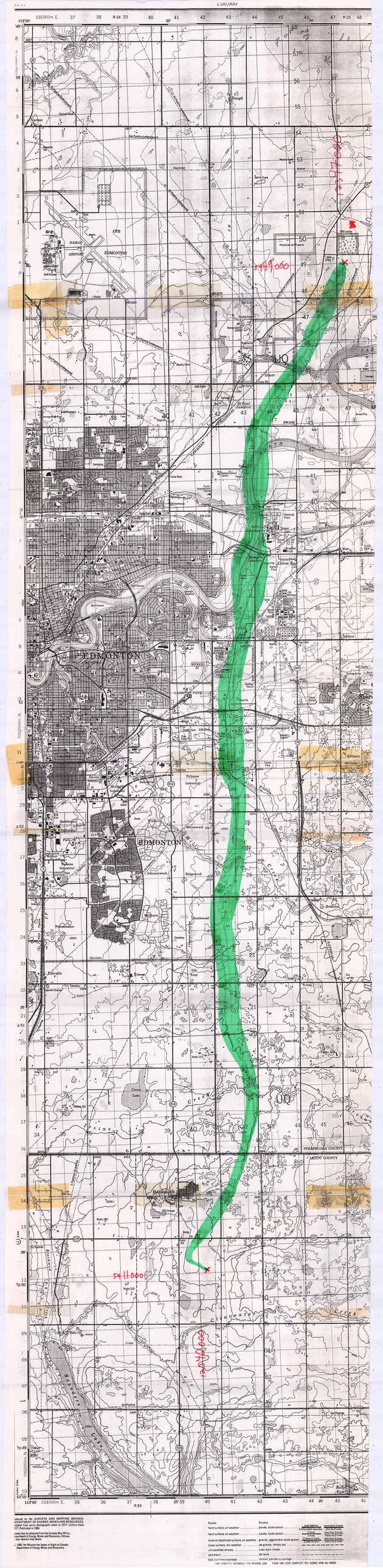
L.O. 12347100 5949000 150 C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VICTIMS BY NAME

Victim	Initials	Age	Location	How	Comments
Allan	Jim	51	Evergreen Trailer Park		
Andruchow	Sharon De	15	Evergreen Trailer Park		
Barker	Marie J	50	Evergreen Trailer Park		
Carreiro	Manuel	38	Nault Sawmill, 6274 25 St		
Demetrios	George	19	Nault Sawmill, 6274 25 St	In the rubble	
Dery	Ed	40	North Star Transport Yard		
Dhaliwal	Ajmer	30			
Fankhanel	Lloyd	55	Evergreen Trailer Park		
Gillespie	Richard	29	Lee Mason Tools, 6450 27 St		
Hartfeil	Grant	34		In a truck	
Lewis	Daniel	18	Alberta Truss, 101 Ave	In the rubble	
Ly	To	45	25 St and 84 Ave		
Mendosa	Edito	40	Lee Mason Tools, 6450 27 St		
Nault	Clement	54	Nault Sawmill, 6274 25 St	Body found in the rubble	
Nolin	Alfred	82	Evergreen Trailer Park	In a trailer	
Nolin	Etta	73	Evergreen Trailer Park	In a trailer	
Palmer	Graham	43	Evergreen Trailer Park		
Pancel	Kelly	18	Evergreen Trailer Park	In a trailer	
Putnam	Mary	59	Evergreen Trailer Park		
Reimer	Darcy	11	Evergreen Trailer Park		
Reimer	Dawn	11	Evergreen Trailer Park		
Reimer	Dianne	13	Evergreen Trailer Park		
Reimer	Marvin	40	Evergreen Trailer Park		
Robinson	Pat	31	Evergreen Trailer Park	In a trailer	
Rosychuk	Merle Shi	50	Evergreen Trailer Park		
Trabenik	Gregory	41	Finning Allied, Sherwood Ind		
Zaparyniuk	Eugene	42	Strathcona Industrial Site	In his vehicle	

November 5, 1987

Source : Black Friday, The Edmonton Sun

According to CP (Toronto Star, Aug 31, 1987), the Chief Medical Examiners office, (alberta), Merle Bain, 50 yrs, was also a victim.

VICTIMS BY LOCATION

Victim	Initials	Age	Location	How	Comments
Ly	To	45	25 St and 84 Ave		
Lewis	Daniel	18	Alberta Truss, 101 Ave	In the rubble	
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Barker	Marie J	50	Evergreen Trailer Park		
Fankhanel	Lloyd	55	Evergreen Trailer Park		
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Zaparyniuk	Eugene	42	Strathcona Industrial Site	In his vehicle	
Dhaliwal	Ajmer	30			
Hartfeil	Grant	34		In a truck	

November 5, 1987

Canadian Climate Centre
4905 Dufferin Street
Downsview, Ontario
M3H 5T4

September 18, 1987

Robert den Hartigh , ALBERTA TRANSPORTATION
4999 98th Avenue , 3rd Floor
Edmonton, Alberta
T6B 2X3 (403) 427-8310

Dear Mr.den Hartigh :

With reference to my telephone call to you yesterday concerning the Edmonton tornado photographs, I am enclosing a cheque for $21 to cover the cost of 3 sets of 14 each.

Many thanks for your help in this matter. As discussed, you can give them to Al Wallace in the Alberta Weather Centre who will forward them on to me.

Yours sincerely,

Michael Newark

M. J. Newark

MICHAEL J. NEWARK
10 WOODBROOK DR.
BRAMPTON, ONT.
L6W 1W5

983

SEPT 18 1987

Pay to the Order of R. DEN HARTIGH $ 21.00

TWENTY- ONE XX/100 Dollars

CANADIAN IMPERIAL BANK OF COMMERCE
2 MAIN ST. N.
BRAMPTON, ONTARIO L6V 2K7

KEY Newark

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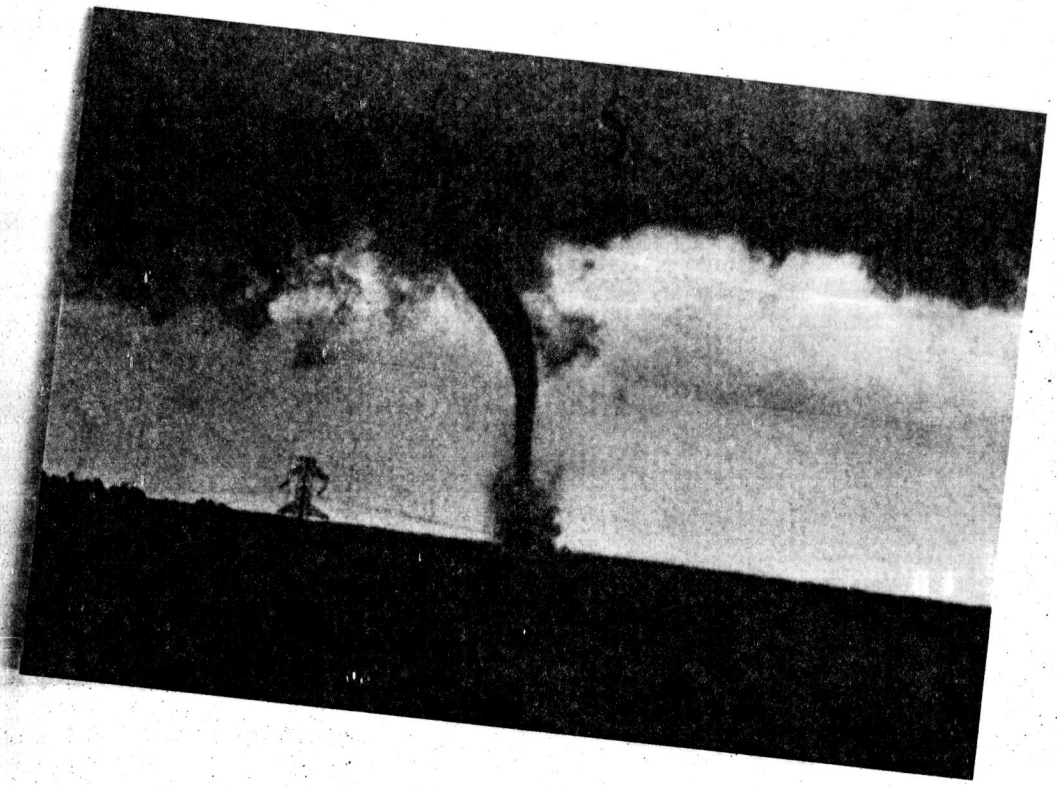
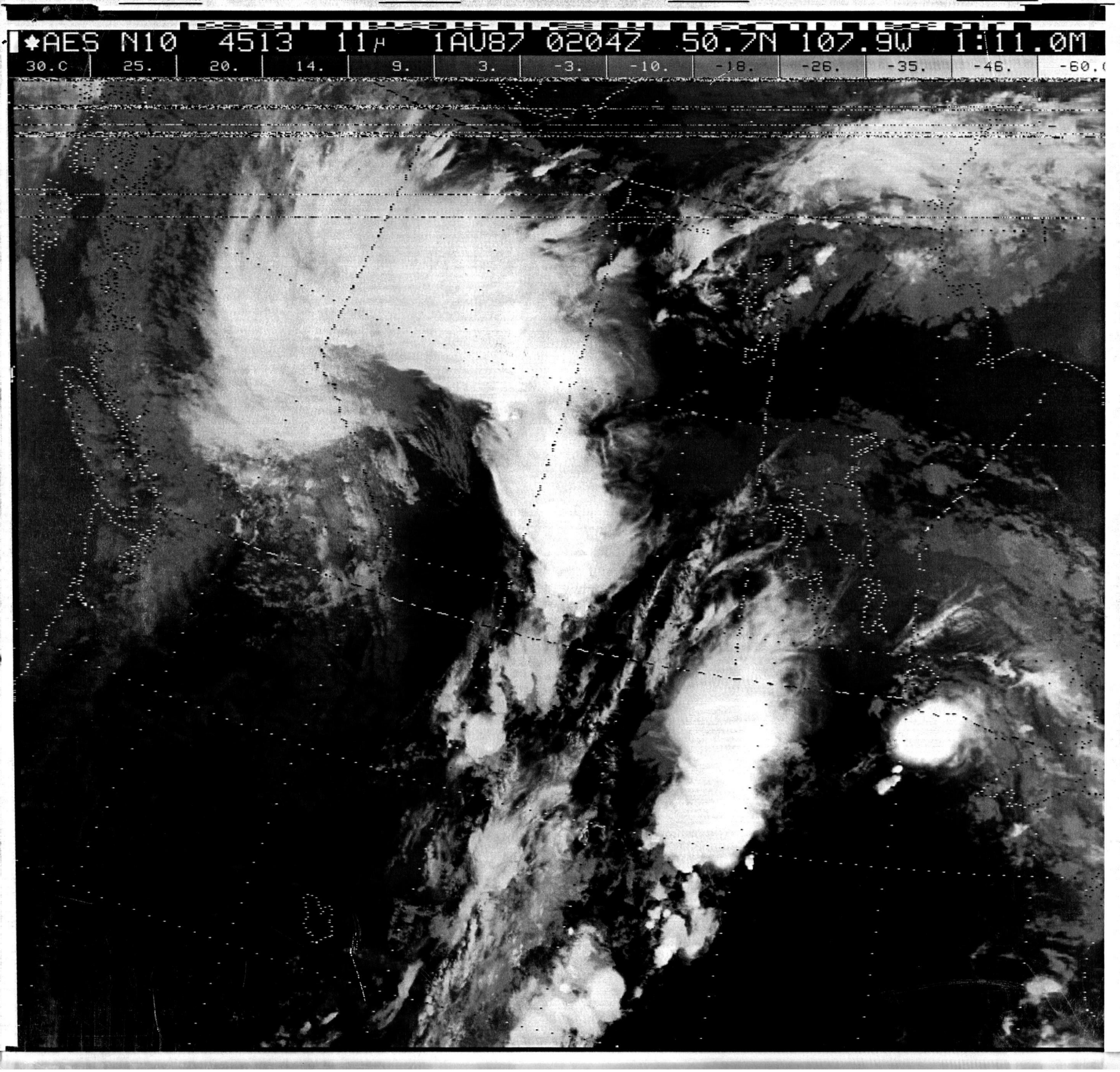


Just NE of LeDuc
& S of Edmonton

STORM DATE JULY 31, 1987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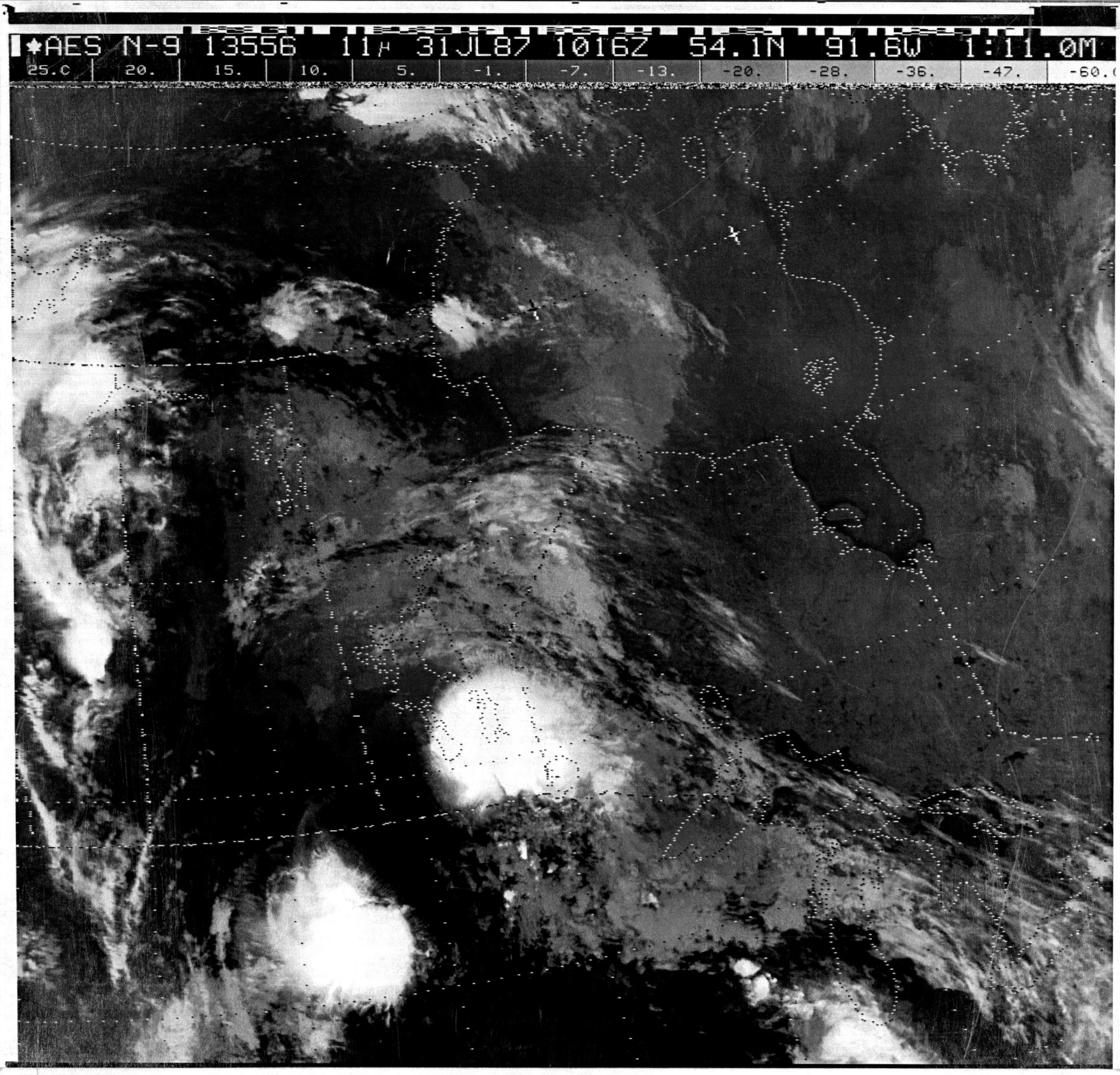
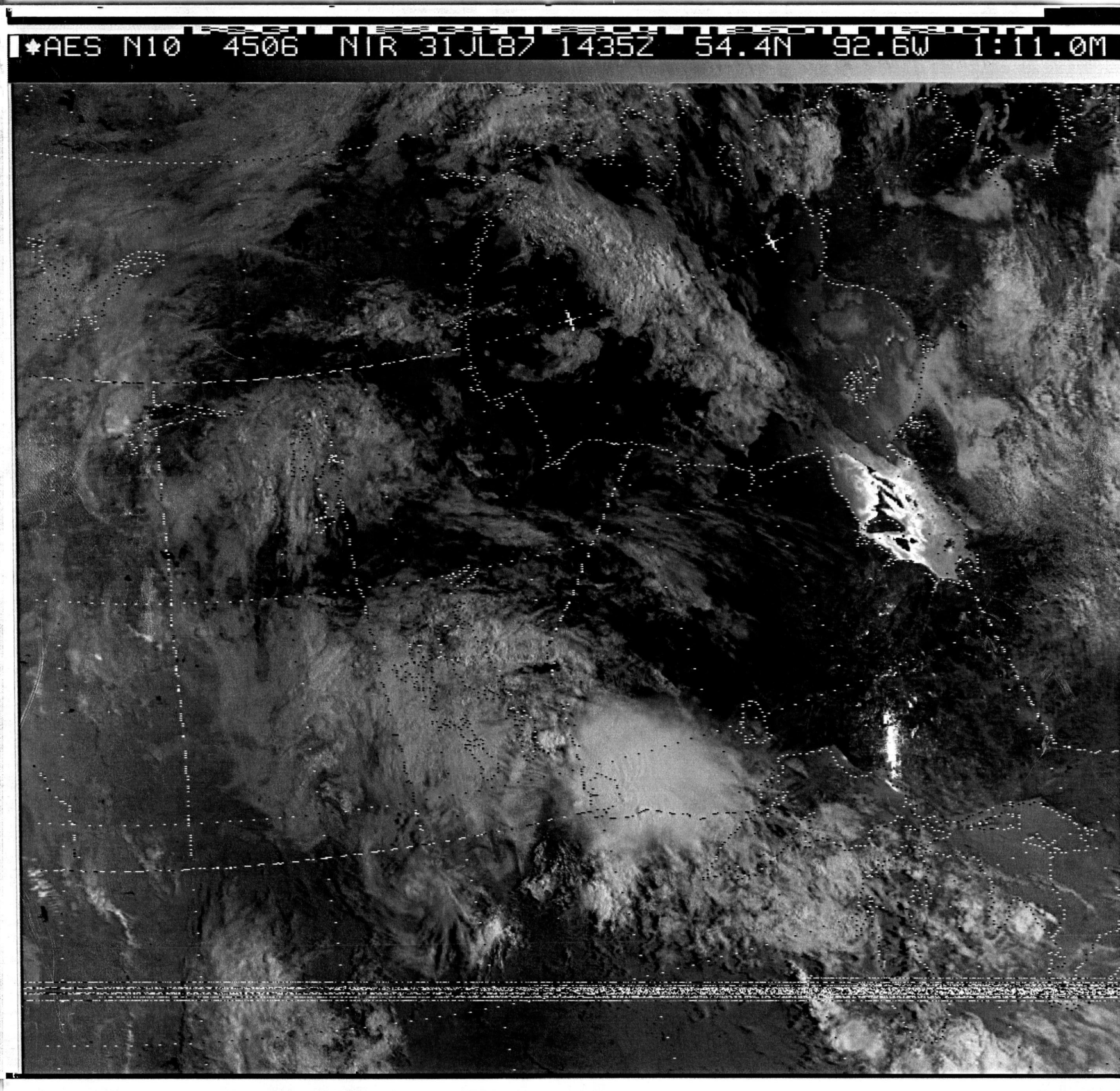
31 July 87 Tornado at Edmonton

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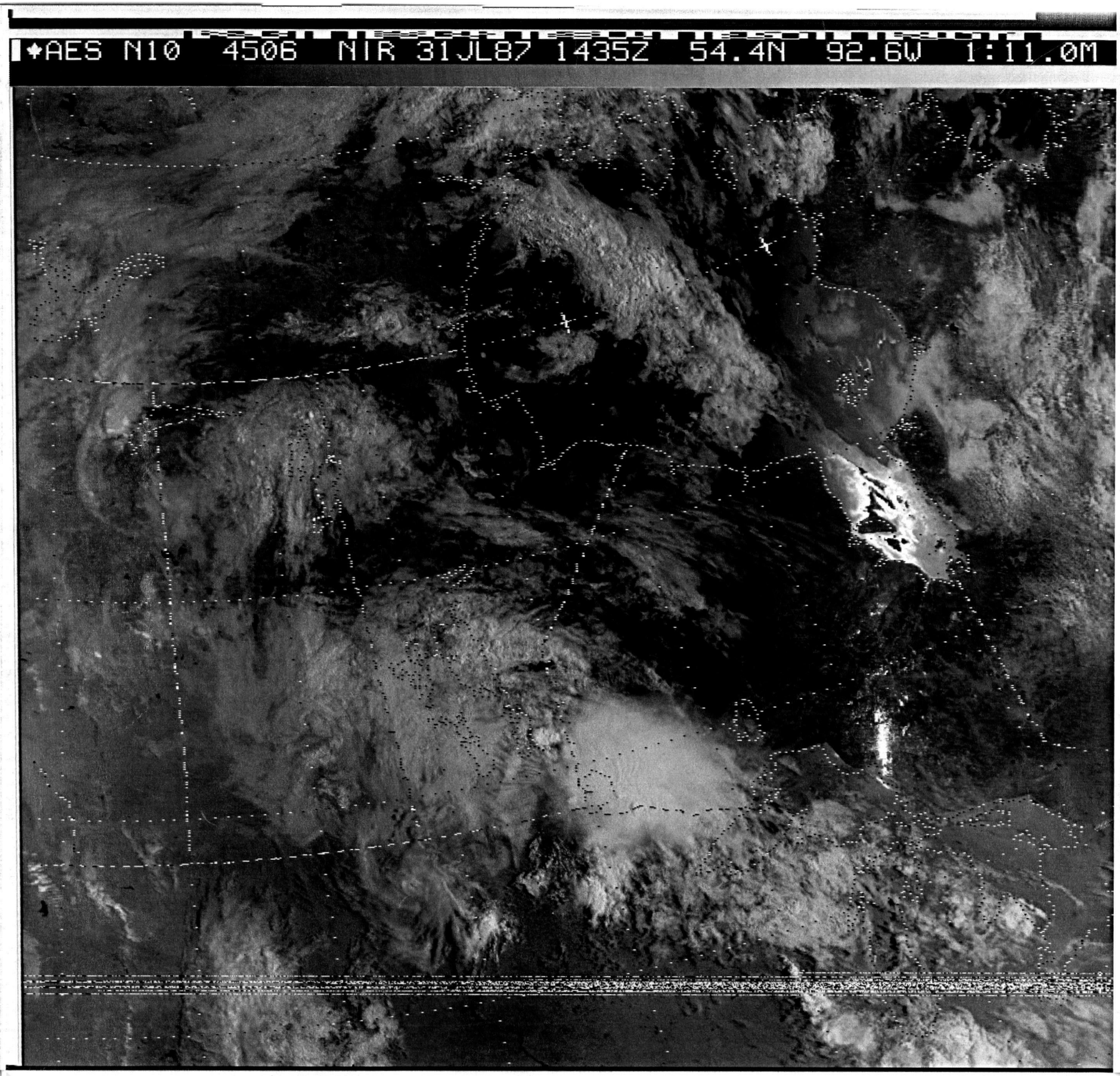
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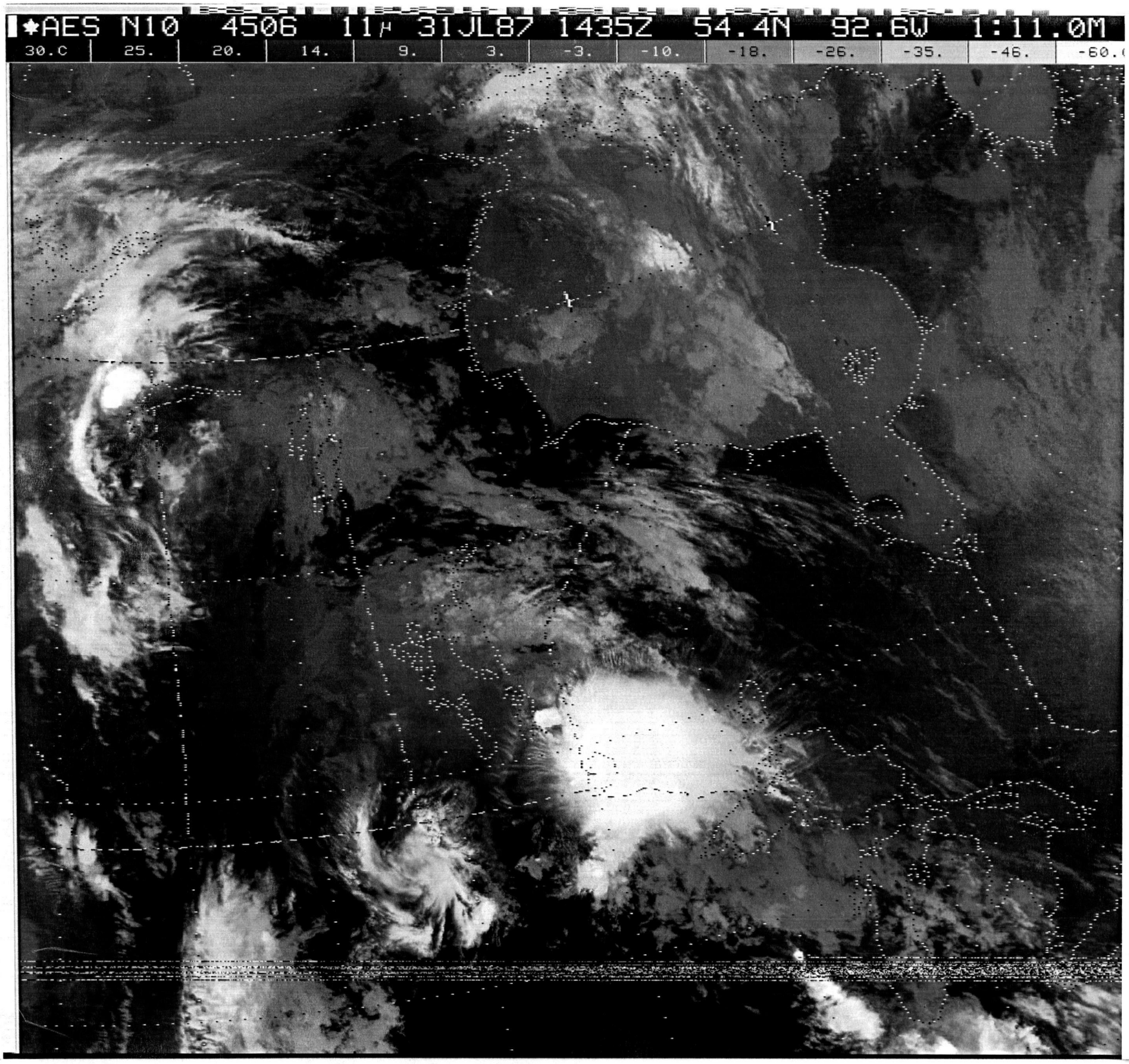
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