

THE CINCINNATI GAS & ELECTRIC COMPANY



Docket No. 50-358

August 1, 1980

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

Attention: D. G. Eisenhut, Director
Division of Licensing

RE: WM. H. ZIMMER NUCLEAR POWER STATION -
UNIT 1 - EVACUATION TIME ESTIMATES

Gentlemen:

In response to NRC letters dated December 26, 1979, March 11, 1980 and July 2, 1980, the following information is submitted for your review:

- (1) March 21, 1980 study performed by the Kentucky Division of Disaster and Emergency Services (DES)
- (2) March 21, 1980 study performed by the State of Ohio Disaster Services Agency (DSA)

A similar study was performed by the Clermont County (Ohio) Disaster Service Agency (CCDSA) and submitted directly to NRC by copy of CCDSA letter dated April 1, 1980, (Kenneth W. Conover to James D. Flynn).

These studies represent the initial attempt of the responsible State agencies to estimate evacuation times for the area surrounding Zimmer Station. The results are judged to be extremely conservative and will, no doubt, change as the emergency plans for Ohio, Kentucky and the surrounding counties are finalized later this year. It is our intention to continue working with Kentucky DES, Ohio DSA, and Clermont County DSA throughout this process.

It must be emphasized that the lack of a standardized methodology for performing these calculations does not allow a direct comparison of the estimates provided by Kentucky and Ohio with those provided to NRC through FEMA or by other reactor Licensees. The assumptions utilized, as well as the degree of sophistication with which this problem is approached, can result in time estimates which vary by orders of magnitude. For example,

8008060261*

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STATE OF OHIO
ADJUTANT GENERAL'S DEPARTMENT

2825 WEST GRANVILLE ROAD
WORTHINGTON, OHIO 43085

JAMES C. CLEM
MAJOR GENERAL
THE ADJUTANT GENERAL

DISASTER SERVICES AGENCY

AGOH-DS

21 March 1980

Wm. H. Zimmer Nuclear Power Station
The Cincinnati Gas & Electric Company
P.O. Box 960, Room 503M
Cincinnati, Ohio 45201

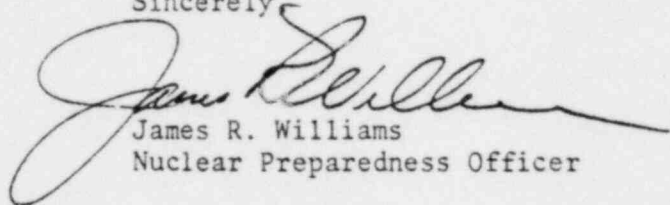
ATTN: Mr. James D. Flynn

Gentlemen:

Enclosed you will find a study of the vicinity around the Zimmer Nuclear Power Station as requested.

Should you have any questions of the material submitted, feel free to call.

Sincerely,



James R. Williams
Nuclear Preparedness Officer

Enclosures
as stated

RBJ/ct

INTRODUCTION

One response in Emergency Planning in Clermont County for an accident at Zimmer Nuclear Power Station (Moscow, Ohio) would be Evacuation.

In order to arrive at a reasonable estimate of evacuation times under both normal and adverse conditions, a variety of sources were used.

Records maintained by the Ohio Disaster Services Agency of disasters in Clermont County were reviewed. The U.S. Department of Commerce Census Figures and Ohio Department of Transportation Traffic Surveys were used in computations of time estimates. However, more current data was obtained from the County greatly changing our estimates. The population within the 10 mile planning area has increased about 33% since the last census, so the major data contribution to our estimates was obtained from local County agencies and people of Clermont County.

Our estimates of evacuation are based on evacuation of the major population by use of privately owned vehicles.

REQUIREMENT I

Clermont County, Ohio Evacuation and Warning Times (based on existing warning systems and optimum - adverse weather conditions).

A. Optimum (fair weather) conditions:

<u>ZONE</u>	<u>SECTOR</u>	<u>INHABITANTS</u>	<u>ESTIMATED EVACUATION TIME</u>
2 miles	North 180°	164	1 hr. 15 min.
2 miles	South 180°	680	2 hrs. 30 min.
5 miles	Northwest 90°	255	2 hrs. 45 min.
5 miles	Northeast 90°	2490	4 hrs. 45 min.
5 miles	Southeast 90°	1441	4 hrs. 30 min.
5 miles	Southwest 90°	Will evacuate with SE 90°	
10 miles	Northwest 90°	6925	6 hrs. 15 min.
10 miles	Northeast 90°	12570	12 hrs. 45 min.
10 miles	Southeast 90°	8340	8 hrs. 0 min.
10 miles	Southwest 90°	Will evacuate with SE 90°	

NOTES:

1. Prompt notification system not in place.
2. Due to the small numbers of population in the 2 mile area, we are using only N-180° and S-180° sectors.
3. In the SW 90° there are also small numbers of population and they will evacuate with the SE-90° sector.

B. Adverse (poor weather) conditions:

<u>ZONE</u>	<u>SECTOR</u>	<u>INHABITANTS</u>	<u>ESTIMATED EVACUATION TIME</u>
2 miles	North 180°	164	3 hrs. 0 min.
2 miles	South 180°	680	6 hrs. 0 min.
5 miles	Northwest 90°	255	4 hrs. 30 min.
5 miles	Northeast 90°	2490	10 hrs. 30 min.
5 miles	Southeast 90°	1441	9 hrs. 0 min.
5 miles	Southwest 90°	Will evacuate with SE 90°	
10 miles	Northwest 90°	6925	12 hrs. 30 min.
10 miles	Northeast 90°	12570	24 hrs. 30 min.
10 miles	Southeast 90°	8340	16 hrs. 0 min.
10 miles	Southwest 90°	Will evacuate with SE 90°	

REQUIREMENT II

Special Facilities

The Clermont Hospital is located well outside the ten mile planning zone.

- A. There are two Nursing Homes which would require some assistance. The Dobbins Nursing Home in New Richmond has about 22 patients, five of which require an ambulance to evacuate. Estimate 4 hours to evacuate under optimum conditions, under adverse conditions, 6 hours.

To: U.S. Nuclear Regulatory Commission

August 1, 1980

Re: Wm. H. Zimmer Nuclear Power Station -
Unit 1 - Evacuation Time Estimates

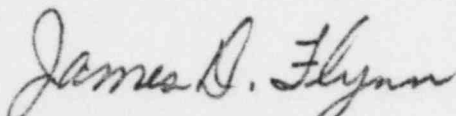
Page #2

the evacuation times estimated by Ohio DSA do not assume the existence of a system for prompt notification of the public.

In view of the evacuation time estimates developed in other states, the estimates provided herewith appear to be inordinately high. CG&E has deemed it necessary to provide an independent assessment of the time required to evacuate persons within a 2, 5 and 10 mile radius of Zimmer Station. This assessment will be presented to NRC at a meeting scheduled for August 18, 1980, in your offices and will be submitted formally on the docket at that time.

Very truly yours,

THE CINCINNATI GAS & ELECTRIC COMPANY

By 
JAMES D. FLYNN, Manager
Licensing and Environmental Affairs

JDF:dew

cc: Charles Bechhoefer
Glenn O. Bright
Frank F. Hooper
Troy B. Conner, Jr.
James P. Fenstermaker
Steven G. Smith
William J. Moran
J. Robert Newlin
William G. Porter, Jr.
Earl A. Borgmann
W. Peter Heile
Leah S. Kosik
John D. Woliver
Mary Reder
David K. Martin
Robert A. Jones
Andrew B. Dennison

- B. The Longworth Manor Nursing Home located at Felicity has 35 patients. Estimate 4 hours best conditions to evacuate and 8 hours worst conditions. Ambulances from surrounding areas and buses from (CART) Clermont Authority Rural Transportation will be utilized.

REQUIREMENT III

Confirmation Data

Time to confirm that evacuation has taken place could take from 4 hours optimum to 8 hours adverse conditions.

REQUIREMENT IV

Warning System

The present warning system would be that ZNPS would notify the Sheriff of an incident by telephone or radio. The Sheriff will contact as many Fire and Police Departments as possible via radio and telephone. Then local units will call in their personnel and begin a house-to-house notification. In New Richmond, Police and Fire Departments can use loud speakers. There is no prompt notification system in place, at this time, that will meet the 15 minute warning time. There is a lack of communications capability between emergency services departments within the County and there are not nearly enough sirens to implement a siren warning of the population.

It is estimated that 2 hours might be needed to notify all the population in the 10 mile planning zone.

At present, the County Sheriff in conjunction with the Clermont Disaster Services Agency, is preparing a list of equipment needed to adequately implement a prompt notification system and an analysis capability.

REQUIREMENT V

Special Problems

Flooding along the Ohio River occurs annually to some degree but usually every 3 to 5 years it rises high enough to obstruct traffic along U.S. Route 52 and requires some evacuation of New Richmond and areas directly adjacent to the River.

If evacuation should be required during a time of flooding, then the only routes open would be toward the west, thus, greatly hampering and slowing the evacuation process as shown by some of our estimates for adverse conditions.

REQUIREMENT VI

Background Data

U.S. Department Commerce (census)
Ohio Department Transportation (Traffic Survey)

Clermont County Disaster Services Agency
Clermont County Sheriff
Clermont County Auditor
Clermont County Engineer
Clermont County Regional Planning Department
Ohio Highway Patrol
Clermont Authority Rural Transportation
Dobbins Nursing Home
Longworth Manor Nursing Home

Figures:

1. Location ZNPS
2. Population Density, 10 Mile Planning Zone
3. Notification Chart, Clermont County
4. Average 24 hour Traffic Volume, 10 Mile Planning Zone

Figure 1

LOCATION ZNPS



ZIMMER NUCLEAR POWER STATION MOSCOW, OHIO

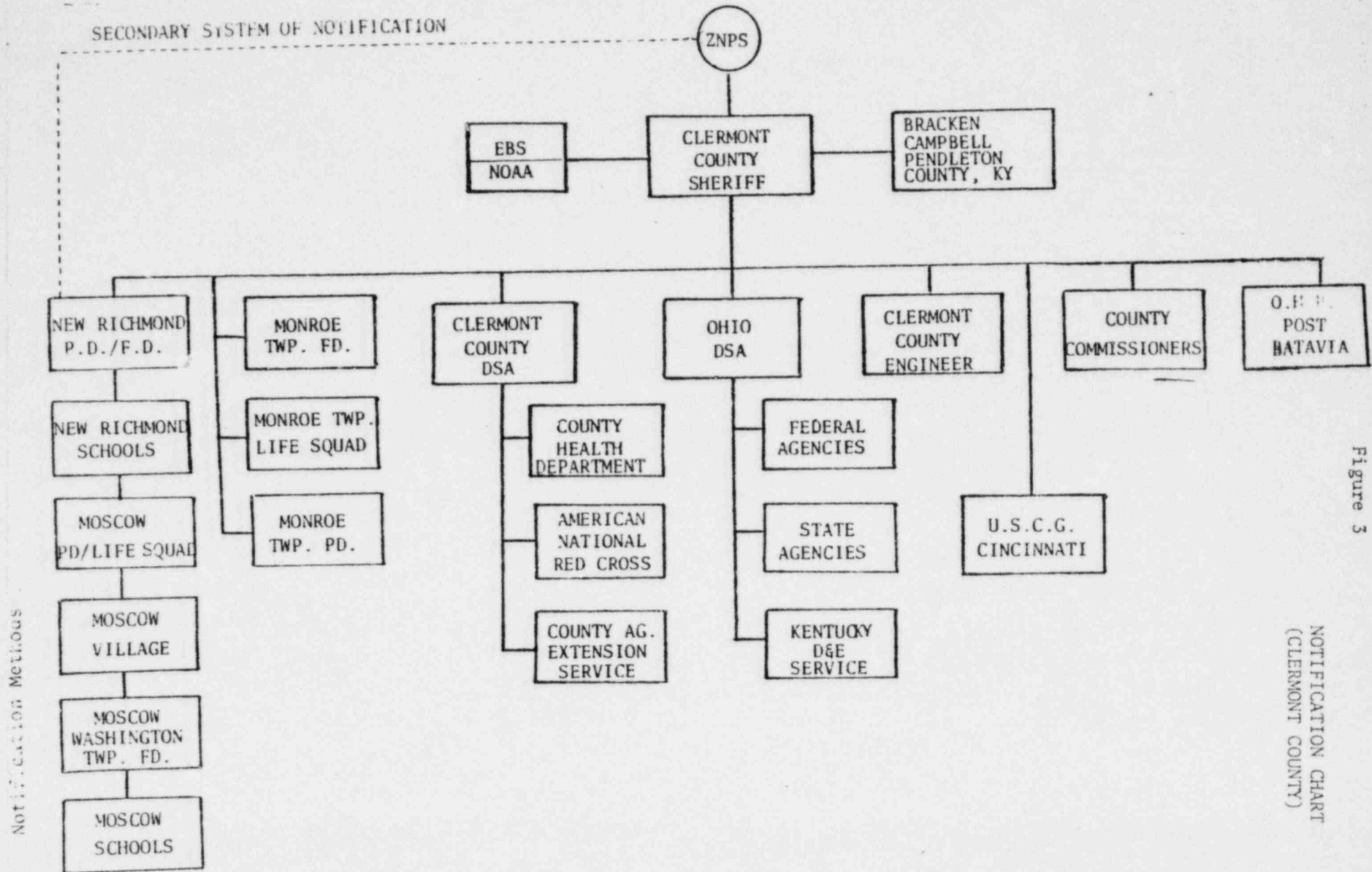
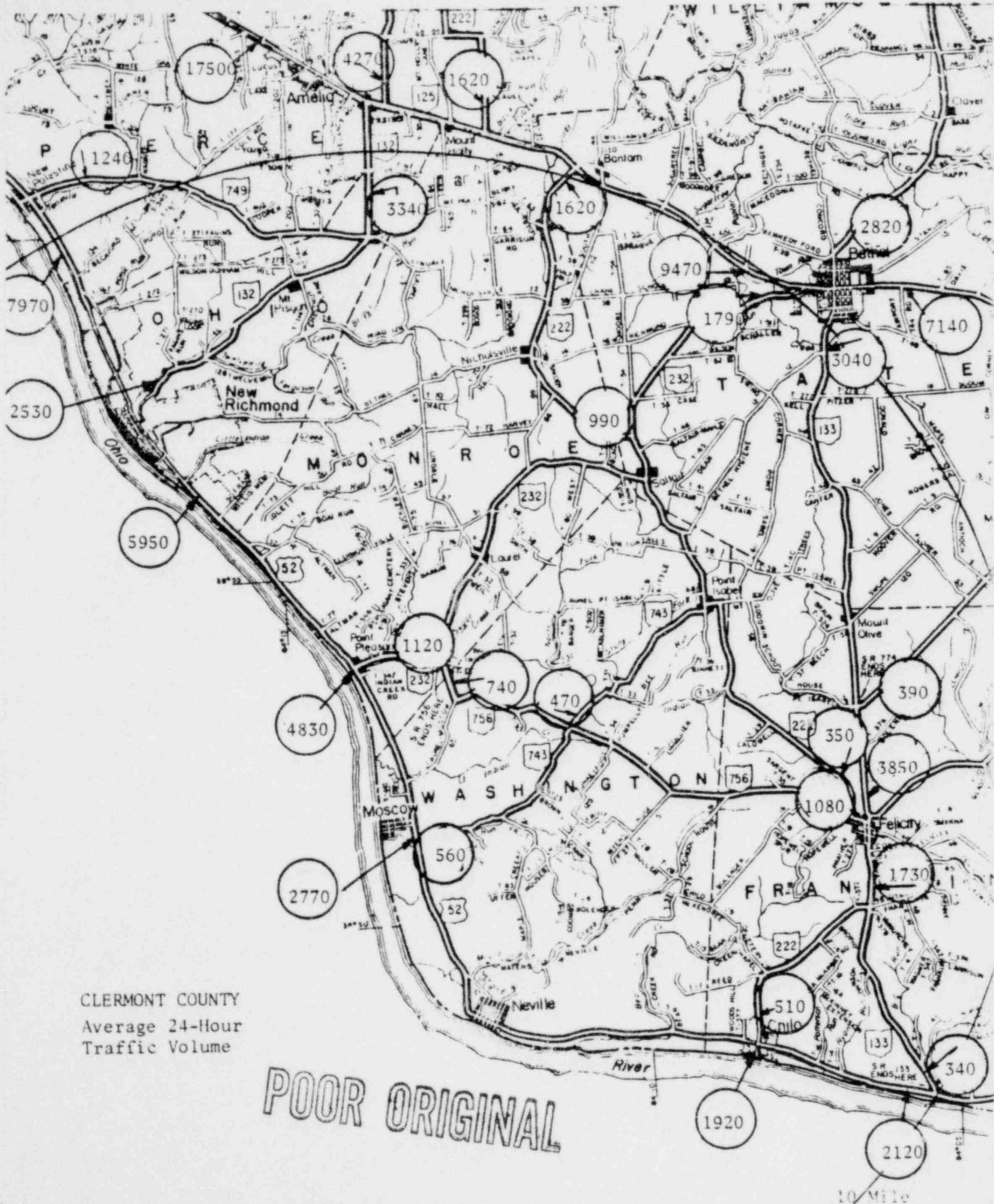


Figure 3

Figure 4

AVERAGE 24 HOUR TRAFFIC VOLUME
10 MILE PLANNING ZONE



CLERMONT COUNTY
Average 24-Hour
Traffic Volume

POOR ORIGINAL

10 Mile



COMMONWEALTH OF KENTUCKY
DEPARTMENT OF MILITARY AFFAIRS
DIVISION OF DISASTER AND EMERGENCY SERVICES
FRANKFORT
40601



21 March 1980

Mr. James D. Flynn, Manager
Licensing and Environmental Affairs
Cincinnati Gas and Electric Co.
Cincinnati, Ohio 45201

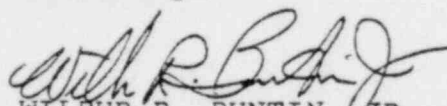
Dear Mr. Flynn:

Enclosed find a copy of the completed Evacuation Time Estimates from within the ten mile emergency planning zone as required of your Company by the Nuclear Regulatory Commission. Please note that these estimates are based on several planning assumptions, most notably that outdoor warning devices for the public and complete communications systems are in place.

County officials were consulted in the preparation of this study and agreed to the findings as stated. If for some reason your personnel feel the study warrants modification before submittal to NRC, notify us immediately so that such modification can be discussed, per our letter to you dated 14 March 1980.

I trust this will assist you in meeting your deadline.

Sincerely,


WILBUR R. BUNTIN, JR.
Executive Director

WRB/CM/asb

Enclosure

Kentucky Evacuation Time Survey
for the
Zimmer Nuclear Power Station EPZ

I. General Coordination

Throughout this study, state planners consulted local officials in the three counties involved in order to obtain as accurate information as possible about conditions that would affect evacuation out of the 2 mile, 5 mile, and 10 mile Emergency Planning Zones (EPZ). School superintendents, local Disaster and Emergency Service Coordinators, the Superintendent of Kincaid State Park and County Judge-Executives and their staffs were able to provide data on population, road condition information, etc. so that state planners could compile this data into a viable survey.

II. Geographic Description of the Kentucky EPZ

The area of Kentucky lying within the Zimmer EPZ is a predominately rural farming area of low population density. As one gets closer to the Cincinnati metropolitan area to the west, the population density increase and land use changes from a farming to a residential flavor.

The terrain features rolling hills used mainly for pasture land, although some crops, such as tobacco are grown. Many small streams and creeks flow throughout, mostly draining into the Ohio River although some flow into the Licking River in Campbell County. After a steep descent off the bluffs overlooking the Ohio River, the land flattens forming the river valley where more housing, cropland and transportation routes are located.

The major transportation arteries include KY 8 which runs along the river from Ashland, KY to Newport, KY; the Chesapeake and Ohio Railroad which parallels KY 8; US 27 which runs from the Newport, KY area south through Falmouth in Pendleton County; KY 10 which traverses all three counties, running from Maysville, KY to Newport and the Ohio River which is utilized by both pleasure and commercial traffic.

III. Situations and Assumptions

Certain conditions exist in and around the Zimmer EPZ which would affect the smooth, quick evacuation of residents. They are as follows:

A. General Conditions and Assumptions

1. The hilly terrain.
2. Crooked, narrow 1 & 2 lane roads.
3. During severe winter weather, most routes would be impassable.
 - a) There is not enough snow removal equipment to adequately clear the roads.
 - b) These roads were not designed to handle the increased traffic flow that would occur during evacuation even in good weather.
 - c) As there are many hills, icy conditions would prevent many vehicles from traversing the evacuation routes.
4. The warning and communications system that could provide a 15 minute warning is in place. Other wise, warning the public could take many hours.
5. Radiological conditions permit evacuation.
6. A 30 minute preparation time for evacuees to collect essential items such as clothing, medicines etc. and to "shut up the house" is provided.
7. A comprehensive public information and training program has been conducted.
8. A communications system to schools and other special facilities is in place to provide 15 minute warning.

B. Bracken County

One school lies just inside the 10 mile EPZ.

C. Pendleton County

1. Kincaid State Park is within the EPZ.
 - a) Up to 4,000 may use its facilities on a summer Sunday afternoon.
 - b) The park is closed from November to February.

2. The county has four special facilities that affect the evacuation times.

D. Campbell County

1. If evacuation occurs during the day, transportation will be a problem unless there are many two car families because most of the work force is employed in Hamilton County, Ohio.
2. In several places, high water (58 feet) along the Ohio River floods KY 8.
3. Several creeks flood in the Gubser Mill area which could cause the use of alternate routes.
4. Sports crowd of up to 2,500 people occur in the Alexandria, Kentucky area during football and basketball seasons.
5. Busses are not always available at some of the 8 schools in the EPZ and they will have to be dispatched to the schools.
6. Notification will be a problem as all the EPZ is rural with the exception of the City of Alexandria, Kentucky, population 4,500.
7. Only 1 four lane highway is in existence from Alexandria, Kentucky (Route 27 N) to I-275 and traffic congestion is sometimes heavy as you approach the urban areas. Other evacuation routes are over two lane federal state and county roads.
8. The person who is coordinating the evacuation of each school will confirm via the telephone "hot line" that the evacuation has been accomplished. This confirmation will be transmitted as soon as the busses are loaded and ready for movement to shelter.

IV. Methodology

This study was based on information provided by local officials in the areas affected. The number of vehicles was gathered from the county Bureau of Motor Vehicles offices. Population figures came from a variety of sources including surveys of the U.S. Census Bureau, estimates by local officials, etc. Road condition and capability data was provided by the local officials and sources with the Kentucky Department of Transportation. State planners drove over the evacuation routes to estimate the evacuation times and evaluate road conditions.

DAVID H. PRIBBLE
PENDLETON COUNTY JUDGE EXECUTIVE
FALMOUTH, KENTUCKY 41040
TELEPHONE 606-654-4321

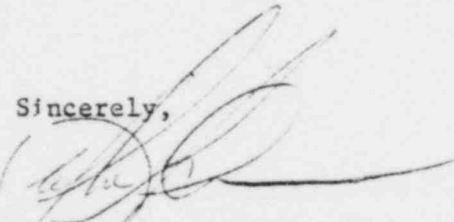
March 21, 1980

Wilbur R. Buntin
Executive Director
Division of Disaster & Emergency Services
E.O.C. Bldg.
Frankfort, Kentucky 40601

Dear Mr. Buntin:

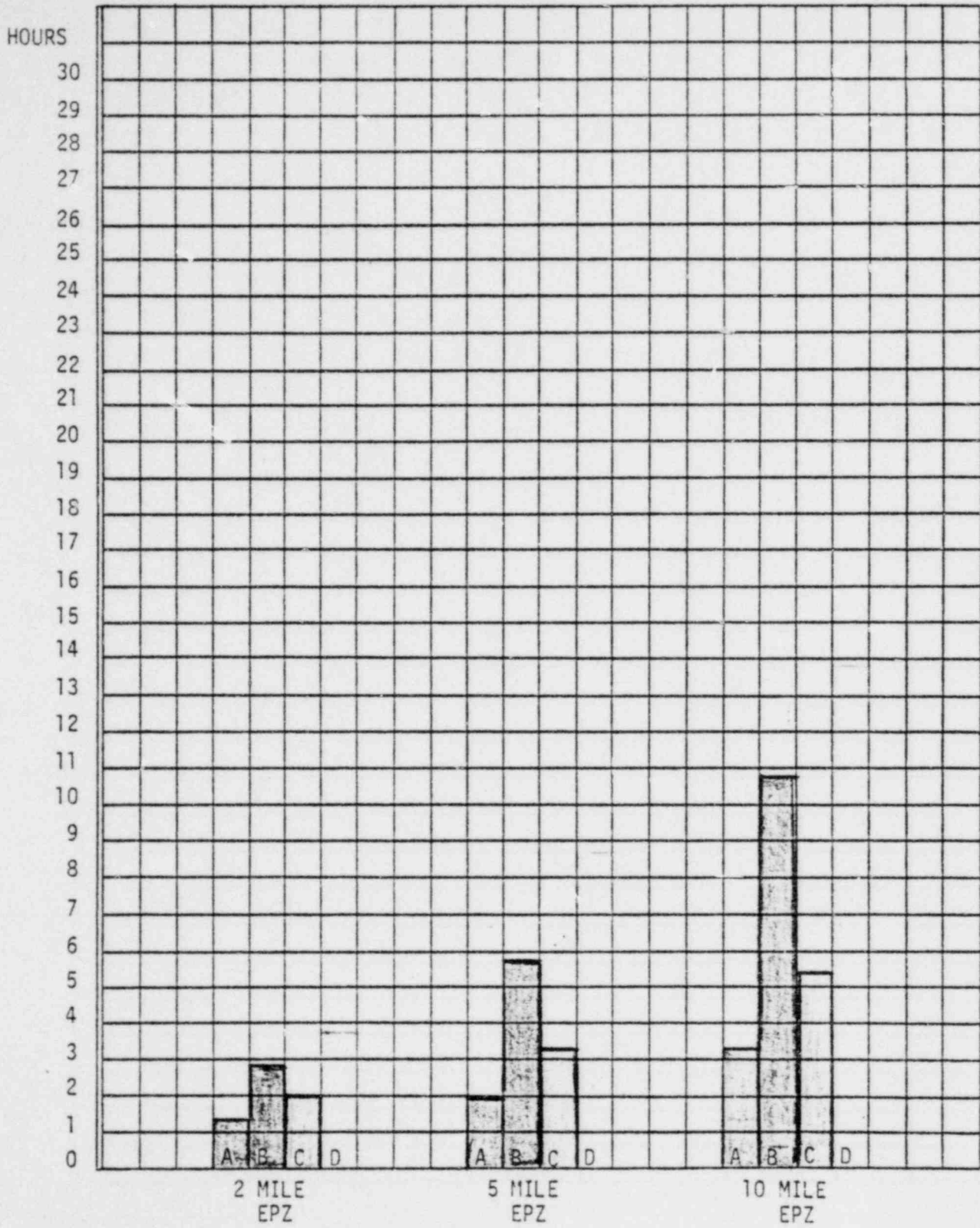
I concur with the evacuation estimates provided through a joint state and county planning effort.

Sincerely,

A handwritten signature in black ink, appearing to read "Mike Fisher", written over a horizontal line.

Mike Fisher, Pendleton County Director
Disaster Emergency Services

PENDLETON COUNTY EVACUATION TIMES



- A Best Estimate
- B Adverse Estimate
- C Best Estimate including special facilities
- D Adverse Estimate including special facilities

Note: The above times assume a 15 minute notification and DO NOT include confirmation times.

CAMPBELL COUNTY
Office of County Judge/Executive

24 W. 4TH ST. • (P.O. BOX 140) • NEWPORT, KENTUCKY 41072

LAMBERT HEHL

TELEPHONE
(606) 292-7838

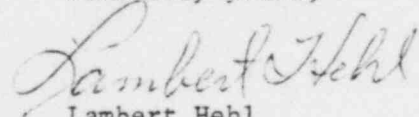
March 21, 1980

Mr. James D. Flynn, Manager
Licensing and Environmental Affairs
Cincinnati Gas and Electric Company
Cincinnati, Ohio 45201

Dear Mr. Flynn:

I have reviewed the information contained in the basic report and
I concur in the meaning and content of the report.

Sincerely yours,

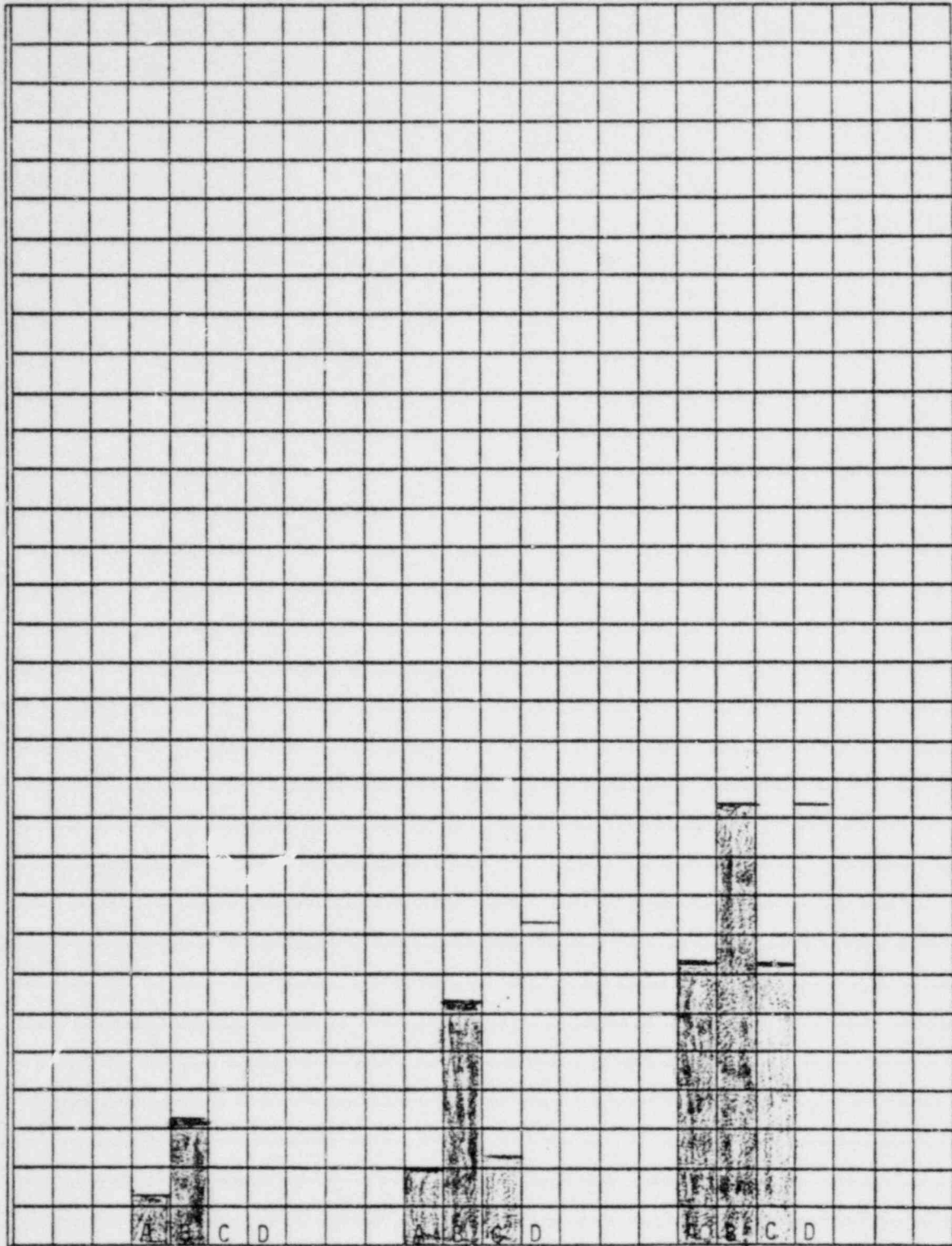

Lambert Hehl
County Judge/Executive

LH:cd

Campbell County Evacuation Times

HOURS

30
29
28
27
26
25
24
23
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21
20
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- Best Estimate
- Adverse Estimate
- Best Estimate including special facilities
- Adverse Estimate including special facilities

Note: The above times assume a 15 minute notification and DO NOT include confirmation times.

JOHN CORLIS
JUDGE, BRACKEN COUNTY COURT
PHONE: 735-2300
BROOKSVILLE, KY. 41004

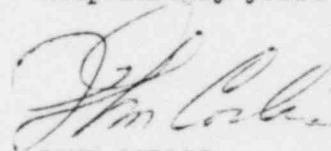
March 21, 1980

General Wilbur R. Buntin Jr.
Kentucky DES
Boone National Guard Center
Frankfort, Kentucky 40601

Dear General Buntin,

I have reviewed the Bracken County portion of the Kentucky Evacuation Time Survey for the Zimmer Nuclear Power Station EPZ and I concur with the data there presented.

Respectfully yours

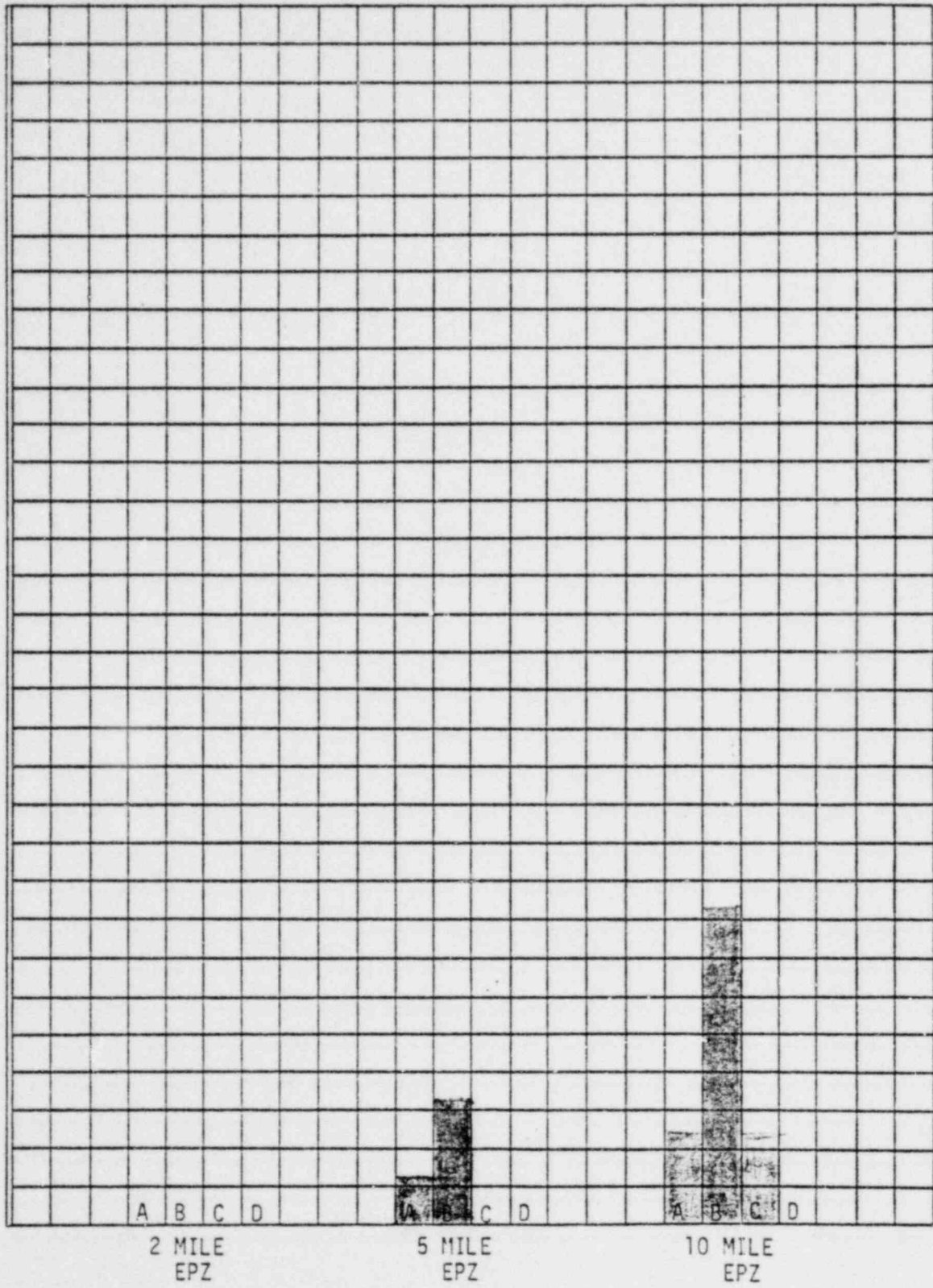


JOHN CORLIS
BRACKEN COUNTY
JUDGE EXECUTIVE

BRACKEN COUNTY EVACUATION TIMES

HOURS

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- A-Best Estimate
- B-Adverse Estimate
- C-Best Estimate including special facilities
- D-Adverse Estimate including special facilities

Note: The above times assume a 15 minute notification and DO NOT include confirmation times.