I. PURPOSE

A. This procedure describes the sequence of events and the manning requirements for activation of the Technical Support Center in the event of an ALERT, SITE AREA EMERGENCY, or GENERAL EMERGENCY declaration. Areas covered are:

1. Functions of the TSC and its interface with other bodies of the On-Site Emergency Organization.

2. Activation criteria, including a roster of personnel and checklists of required actions to be performed.

II. DISCUSSION

A. Functions Of TSC.

The TSC provides facilities, communications, and technical data for support of the Emergency Director/TSC Director. TSC staff personnel shall research drawings, specifications, test data, and other engineering data as required to:

1. Recommend alternative courses of action which may be taken to mitigate the consequences of the event.

2. Evaluate the effects of abnormal system configuration on future operational evolutions.

3. Ensure that technical evaluations are being conducted with the most current information and that operational evolutions are properly planned.

The TSC also provides:

1. A communications link for data flow between the Control Room and the Emergency Operations Facility (EOF).

2. Off-site dose assessment and communications capabilities until the EOF is prepared to assume these responsibilities.

Note: Attachment "A" shows the floor plan of the TSC.

B. Staffing Of TSC.

1. The TSC is staffed with the following personnel:

   a. Emergency Director (for an ALERT or until the EOF is activated).

   b. TSC Director (if the EOF has been activated).

   c. Emergency Planning Coordinator (for an ALERT or until the EOF is activated).

   d. Maintenance and OSC Coordinator.

   e. Security/Administration/Logistics Coordinator.

   f. Chemistry and Health Physics Coordinator.

   g. Engineering Coordinator.

   h. Reactor and Computer Engineer.

   i. Mechanical Engineer.

   j. Electrical Engineer.

   k. I/C Engineer.

   l. Technical Data Technician.

III. REFERENCE MATERIAL

A. CNS Emergency Plan.

B. NUREG 0654, Revision 1.

IV. PREREQUISITES

A. An ALERT or higher level emergency has been declared in accordance with EPIP 5.7.1, Emergency Classification, and actions specified in EPIP 5.7.3 and/or EPIP 5.7.4 or EPIP 5.7.5 are being implemented.

V. LIMITATIONS

A. The TSC facilities may be used by designated operating personnel for normal daily operations as well as for training and emergency drills. Use of the TSC during normal operation shall be limited to activities that will not degrade TSC preparedness to react to abnormal conditions or reduce TSC systems reliability.

B. If the TSC becomes uninhabitable, the TSC plant management function shall be transferred to the Control Room.

VI. PRECAUTIONS

A. If the Area Alarm Monitor and/or the Continuous Air Monitor alarms, an area habitability survey should be conducted. If the Chemistry and Health Physics Coordinator determines that the TSC is uninhabitable, the TSC function shall be transferred to the Control Room. Personnel not considered crucial in responding to the specific emergency situation will report to the Maintenance OSC, I & C/Electrical OSC, Chemistry and Health Physics OSC or the Security Building Auditorium.

VII. EQUIPMENT

A. Communications.

1. A list of communications equipment located in the TSC and instructions for its use are detailed in EPIP 5.7.22, Communications.

B. Emergency Equipment.

1. A list of emergency equipment located in the TSC and instructions for maintaining the readiness of the equipment are detailed in EPIP 5.7.21, Emergency Equipment Inventory.

VIII. PROCEDURE

A. TSC Personnel Shall Report To TSC And Proceed With Check-Off Lists As Follows:

1. Emergency Director - Attachment "B" (and Attachment "C" for ALERT only).

2. Emergency Planning Coordinator - Assist Emergency Director with Attachments "B" and "C" and with communications.

3. TSC Director - Attachment "C" (SITE AREA and GENERAL EMERGENCIES).

4. Security/Administration/Logistics Coordinator - Attachment "D".

5. Maintenance and OSC Coordinator - Attachment "E".

6. Chemistry and Health Physics Coordinator - Attachment "F".

7. Engineering Coordinator - Attachment "G".

B. Emergency Director Will Initiate The Following Action Items:

1. Conduct meetings with the Emergency Director (relieved), Chemistry and Health Physics Coordinator, TSC Director, and Engineering Coordinator, and any other members of the TSC staff as appropriate. Ensure that TSC personnel are prepared to assume their responsibilities.

2. Declare the TSC operational and have the following transfers of control made:

   a. Emergency Director, notify the Shift Supervisor that you are taking over the function of overall responsibility for site response.

   b. Chemistry and Health Physics Coordinator, notify the Control Room that you are assuming the assessment function.

   c. Ensure that other personnel take command by notifying the appropriate contacts.

IX. ATTACHMENTS

A. Attachment "A", TSC Floor Plan.

B. Attachment "B", Emergency Director Checklist.

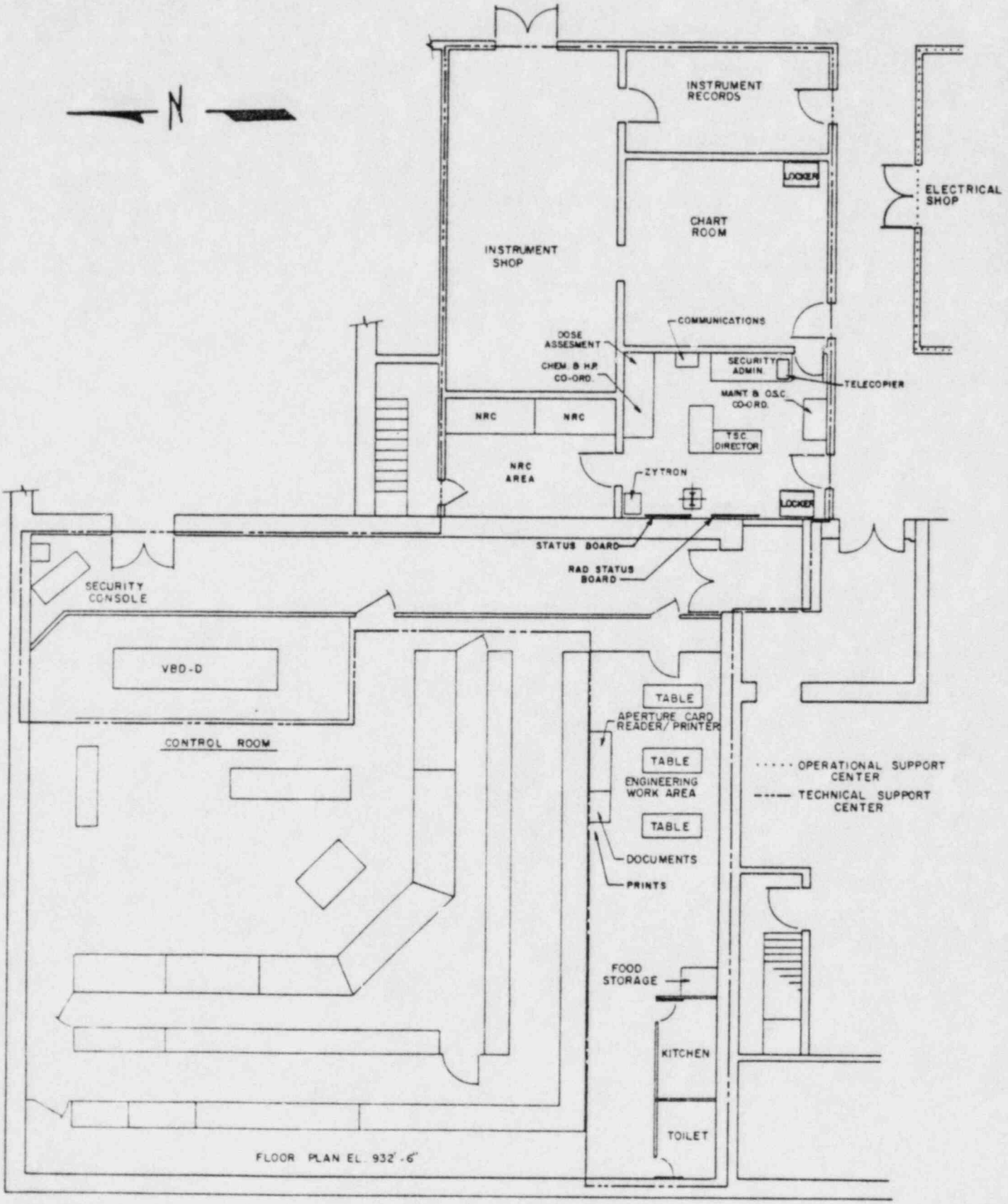
C. Attachment "C", TSC Director Checklist.

D. Attachment "D", Security/Administrative/Logistics Coordinator Checklist.

E. Attachment "E", Maintenance And OSC Coordinator Checklist.

F. Attachment "F", Chemistry and Health Physics Coordinator Checklist.

G. Attachment "G", Engineering Coordinator Checklist.


N
INSTRUMENT RECORDS
LOCKER
ELECTRICAL SHOP
CHART ROOM
INSTRUMENT SHOP
COMMUNICATIONS
DOSE ASSESMENT
CHEM. & H.P. CO-ORD.
SECURITY ADMIN.
TELECOPIER
MAINT. & O.S.C. CO-ORD.
NRC
NRC
T.S.C. DIRECTOR
NRC AREA
ZYTRON
LOCKER
STATUS BOARD
RAD STATUS BOARD
SECURITY CONSOLE
VAX-D
CONTROL ROOM
TABLE
APERTURE CARD READER/ PRINTER
TABLE
ENGINEERING WORK AREA
TABLE
DOCUMENTS
PRINTS
OPERATIONAL SUPPORT CENTER
TECHNICAL SUPPORT CENTER
FOOD STORAGE
KITCHEN
TOILET
FLOOR PLAN EL. 932'-6"

EMERGENCY DIRECTOR CHECKLIST

ACTION ITEMS — TIME/INITIALS

1. Contact the Shift Supervisor and review:

   a. The logic used to establish the classification of the event. _____/_____

   b. Status of plant conditions. _____/_____

   c. Status of notification to off-site agencies. _____/_____

   d. Recommended protective actions made to date and his knowledge of states' actions (if necessary). _____/_____

2. Upon reporting to the TSC, assume from the Shift Supervisor the responsibilities for site response and communication with off-site agencies, and ensure that the following positions are manned: _____/_____

Emergency Position	Primary	Alternate
Emergency Director	Station Superintendent	Assistant to Station Superintendent
Emergency Planning Coordinator	Emergency Planning Coordinator	Q.A. Specialist
Engineering Coordinator	Engineering Supervisor	Station Reactor Engineer
Maintenance and OSC Coordinator	Maintenance Supervisor	Maintenance Planner and Scheduler
Chemistry and Health Physics Coordinator	Chemistry and Health Physics Supervisor	Station Health Physic
Security/ Administration/ Logistics Coordinator	Administrative Supervisor	Technical Assistant to Station Supervisor

3. Notify the NPPD Division Manager of Power Operations of the declared EAL. _____/_____

4. Ensure that the Chemistry and Health Physics Coordinator has contacted Nebraska Department of Health, Division of Radiological Health and the Missouri Division of Health and determined the status of implementation of previously recommended protective actions. _____/_____

EMERGENCY DIRECTOR CHECKLIST

ACTION ITEMS	TIME/INITIALS
5. Verify that notification has been made to the emergency response organization.	_____/_____
6. Declare the TSC to be operational.	_____/_____
7. Assign personnel to evaluate plant conditions based on information available from Control Room.	_____/_____
8. Review the personnel accountability report.	_____/_____
9. Determine the need to evacuate non-essential personnel to off-site location (required for SITE AREA and/or GENERAL EMERGENCY).	_____/_____
10. Review the results of dose projections.	_____/_____
11. Make protective action recommendations as appropriate, considering existing plant conditions and potential degradation.	_____/_____
12. Authorize dispatch of on-site survey teams as necessary.	_____/_____
13. Authorize dispatch of off-site survey teams as necessary.	_____/_____
14. Authorize dispatch of rescue/re-entry teams as necessary.	_____/_____
15. Authorize emergency exposure limits as necessary.	_____/_____
16. Determine long-term equipment and manpower needs.	_____/_____
17. After plant is restored to a safe condition, ensure emergency plan is deactivated and off-site personnel and agencies are notified.	_____/_____
18. Provide verbal summary to the NPPD Division Manager of Power Operations and NRC when emergency conditions are resolved and followup with a written summary within eight hours (within 24 hours for a NOTIFICATION OF UNUSUAL EVENT).	_____/_____

TSC DIRECTOR CHECKLIST

ACTION ITEMS	TIME/INITIALS
1. Establish and maintain continuous communications with the Control Room.	_____/_____
2. Determine plant status and relay this information to the TSC staff.	_____/_____
3. Check to assure that all emergency equipment in the TSC is in a state of readiness.	_____/_____
4. Have Reactor Engineer report to the Control Room Director and support Control Room activities as required.	_____/_____
5. Activate the HEPA filters as necessary.	_____/_____
6. The minimum TSC staff shall consist of:	

	NAME	
a. TSC Director.	_____	_____/_____
b. Chemistry and Health Physics Coordinator.	_____	_____/_____
c. Engineering Coordinator.	_____	_____/_____
d. Maintenance and OSC Coordinator.	_____	_____/_____
e. Mechanical Engineer.	_____	_____/_____
f. Electrical Engineer.	_____	_____/_____
g. I & C Engineer.	_____	_____/_____
h. Reactor Engineer.	_____	_____/_____

SECURITY/ADMINISTRATIVE/LOGISTICS COORDINATOR CHECKLIST

ACTION ITEMS	TIME/INITIALS
1. Ensure all communications devices operate in the TSC:	_____/_____
____ Telephones	
____ Gaitronics	
____ Base Radio (Security)	
____ Base Radio (Off-Site)	
____ Bone Phone	
____ TSC Intercom	
____ Sound Powered Phone	
2. Activate Continuous Air Monitor.	_____/_____
3. Ensure copy machine is placed in TSC.	_____/_____
. Notify the Emergency Director/TSC Director when the communications equipment is functional or of any problems and proposed solutions.	_____/_____
5. Check station security by contacting the Central Alarm Station Operator. Request that they initiate POS accountability - receive printout for TSC at SAS.	_____/_____
6. Ensure the security force is aware of the current status of the emergency and of possible actions that might be required of it; contact Guard Shift Supervisor.	_____/_____
7. Ensure CAS, SAS, and Access Control are manned (unless emergency is security-related).	_____/_____
8. Inform the Central Alarm Station Operator that you are ready to assist in security requests/actions.	_____/_____
9. Have Guard Shift Supervisor call in off-duty security personnel as necessary.	_____/_____
10. Ensure the Emergency Response Facility Rosters are available for personnel accountability.	_____/_____
11. Receive reports from CAS on personnel in the OCA.	_____/_____

SECURITY/ADMINISTRATIVE/LOGISTICS COORDINATOR CHECKLIST

ACTION ITEMS

TIME/INITIALS

12. Take personnel accountability reports from supervisory personnel located in the following Emergency Response Coordination Centers:

	Extension	Time	Initials
Control Room			
Health Physics OSC			
Mechanical/Maintenance OSC			
I & C Electric OSC			
EOF			
TSC			

Compare names with security POS and roster lists to aid in accountability; report results of accountability to the Emergency Director. ____/____

13. Check with TSC personnel and determine what documents or support is needed. ____/____

MAINTENANCE AND OSC COORDINATOR CHECKLIST

ACTION ITEMS

		TIME/INITIALS
1.	Check that the Maintenance, Electric, and I & C OSC staffs are present and ready to assume responsibility. Receive similar report from the Chemistry and Health Physics Coordinator regarding the Chemistry and Health Physics OSC staff. Report this or any problems to the Security/Administrative/Logistics Coordinator.	
2.	Assess maintenance problems affecting the emergency and report the problems and any proposed solutions to the ED.	_____/_____
3.	Perform a personnel accountability of all TSC personnel.	_____/_____
4.	Receive accountability reports/status from OSCs and report information to the Security/Administrative/Logistics Coordinator.	_____/_____
5.	Review with Emergency Director need for EOF activation ALERT only.	_____/_____
6.	Ensure that TSC Status Board is updated as conditions change.	_____/_____
		_____/_____

CHEMISTRY AND HEALTH PHYSICS COORDINATOR AND SUPPORT CHECKLIST

ACTION ITEMS	TIME/INITIALS
1. Upon arrival, check that the following items are available to perform dose assessments calculations:	
a. Computerized dose assessment equipment.	_____/_____
b. Meteorological overlays.	_____/_____
c. Procedures and forms.	_____/_____
2. Receive, update, and post status on the Rad Status Board.	_____/_____
3. Contact the Control Room and determine:	
a. Extent and consequences of radiological releases and plant conditions.	_____/_____
b. Protective Action Recommendations made to date.	_____/_____
c. Location of on-site and off-site monitoring teams (if dispatched).	_____/_____
.. Determine that the Chemistry and Health Physics OSC staff is present and ready to perform the initial tasks of:	
a. Radiological assessment.	_____/_____
b. On-site and off-site surveys.	_____/_____
Report status of Chemistry and Health Physics OSC staff to Maintenance and OSC Coordinator.	_____/_____
5. Notify the Emergency Director that the Radiological Assessment Staff is ready to perform dose assessment and determine protective action recommendations.	_____/_____
6. Receive personnel accountability status from Health Physics OSC and report to Security/Administrative/ Logistics Coordinator.	_____/_____
7. Ensure that the Continuous Air Monitor has been activated.	_____/_____
8. Contact the Nebraska Department of Health, and the Missouri Division of Health and determine the status of implementation of previously recommended protective actions, if any.	_____/_____

ENGINEERING COORDINTAOR CHECKLIST

ACTION ITEMS	TIME/INITIALS
1. Ensure nccessary TSC equipment, plant flow diagrams, records, drawings, and schematics are available.	_____/_____
2. Ensure that the aperture cards are moved from the Engineering Area to the TSC.	_____/_____
3. Ensure staff is ready to assume engineering support duties.	_____/_____
4. Determine the need for engineering and/or design specialist assistance (G.E.; Burns & Roe; Stone & Webster, etc.) and recommend to the E.D. that such assistance be obtained.	_____/_____

I. PURPOSE

A. This procedure describes the sequence of events and requirements for activation of the Emergency Operations Facility (EOF) in the event of a SITE AREA EMERGENCY or GENERAL EMERGENCY. This procedure also defines the approach to be used in placing the EOF on standby in the ALERT condition.

B. The topics addressed are:

1. Functions of the EOF and its interface with both on-site and off-site emergency organizations.

2. Activation criteria, including a roster of personnel and checklists of required actions, to be performed.

II. DISCUSSION

A. Functions of the EOF.

1. Provide overall management of NPPD emergency response and resources.

2. Provide coordination of off-site radiological assessment and recommendations for the protection of the public.

3. Provide coordination of emergency response activities with local, state, and federal organizations.

4. Provide operational and communications liaison with off-site radiological emergency survey teams.

5. Disseminate emergency status information to the General Office Emergency Center (GOEC) and Media Release Center (MRC).

B. The EOF is located adjacent to the Security Building outside the station security area. Attachment "A" shows the floor plan of the EOF.

1. If emergency conditions dictate relocation from the EOF, emergency evaluation and coordination activities will be accomplished from the Alternate Emergency Operations Facility (AEOF). The AEOF is located in the town of Auburn, Nebraska, housed in the Auburn National Guard Armory. Attachment "B" shows the floor plan of the AEOF.

C. Staffing of the EOF.

1. The EOF is staffed with the following key personnel:

a. Emergency Director.

b. Emergency Planning Coordinator.

c. Operations Advisor.

d. Information Manager.

e. Security/Administration/Logistics (S/A/L) Manager.

f. Communications Manager.

g. Contract Support Manager.

h. Radiological Manager.

i. Radiological Assessment Coordinator.

j. Technical Information Coordinator.

III. REFERENCE MATERIAL

A. CNS Emergency Plan.

B. General Office Guidelines.

C. NUREG 0654, Revision 1.

IV. PREREQUISITES

A. An ALERT, a SITE AREA EMERGENCY, or a GENERAL EMERGENCY has been declared in accordance with EPIP 5.7.1 and actions specified in EPIP 5.7.3 and/or EPIP 5.7.4 and EPIP 5.7.5 are being implemented.

V. LIMITATIONS

A. The EOF facility may be used by designated CNS personnel for normal daily operations as well as for training and exercises. Use of the EOF during normal operations shall be limited to activities that will not degrade EOF activation, operations, or reliability.

VI. PRECAUTIONS

A. After the EOF is activated it is the responsibility of the Security/Administration/Logistics Manager to ensure security protection is upgraded to allow access to only those personnel assigned to this facility.

B. If the Area Alarm Monitor and/or the Continuous Air Monitor alarms, an area habitability survey should be conducted. The results of the survey should be transmitted to the Radiological Manager who, in conjunction with the Emergency Director, will determine the need to evacuate EOF personnel to the AEOF.

VII. EQUIPMENT

A. Communications.

1. A list of communications equipment located in the EOF is contained in the CNS Emergency Plan. Instructions for its use are detailed in EPIP 5.7.22, Communications.

B. Emergency Equipment.

1. A list of emergency equipment located in the EOF and AEOF is detailed in EPIP 5.7.21, Emergency Equipment Inventory. The AEOF contains a larger quantity of decontamination equipment should decontamination of evacuated station personnel be required.

VIII. PROCEDURE

A. Activation Of EOF.

1. In the event the emergency escalates from an ALERT to a higher classification, the Emergency Director (in the TSC):

a. Directs key personnel within the TSC to report to the EOF and begin activation of the facility (i.e. setting up communications, dose assessment equipment, etc.).

b. Directs the Engineering Supervisor to assume the duties of the TSC Director.

c. Relocates to the EOF after the staff has had an opportunity to ready the facility.

2. EOF personnel shall report to the EOF and proceed with check-off lists as follows:

a. Emergency Director - Attachment 'C".

b. Emergency Planning Coordinator - Assist the Emergency Director with Attachment "C", communications, and other duties.

c. Information Manager - Attachment "D".

d. Security/Administration/Logistics Manager - Attachment "E".

e. Communications Manager - Attachment "F".

f. Radiological Manager - Attachment "G".

g. Technical Information Coordinator - Attachment "H".

3. The Emergency Director shall:

a. Conduct meetings with the Radiological Manager, Emergency Planning Coordinator, Operations Advisor, Communications Manager, Security/Administration/Logistics Manager, Technical Information Coordinator, and any other appropriate members of the EOF staff. Ensure they have assumed their responsibilities.

b. Declare the EOF operational and notify the Shift Supervisor and TSC Director that the EOF has assumed overall responsibility for directing the emergency organization.

IX. ATTACHMENTS

A. Attachment "A", EOF Floor Plan.

B. Attachment "B", AEOF Floor Plan.

C. Attachment "C", Emergency Director Checklist.

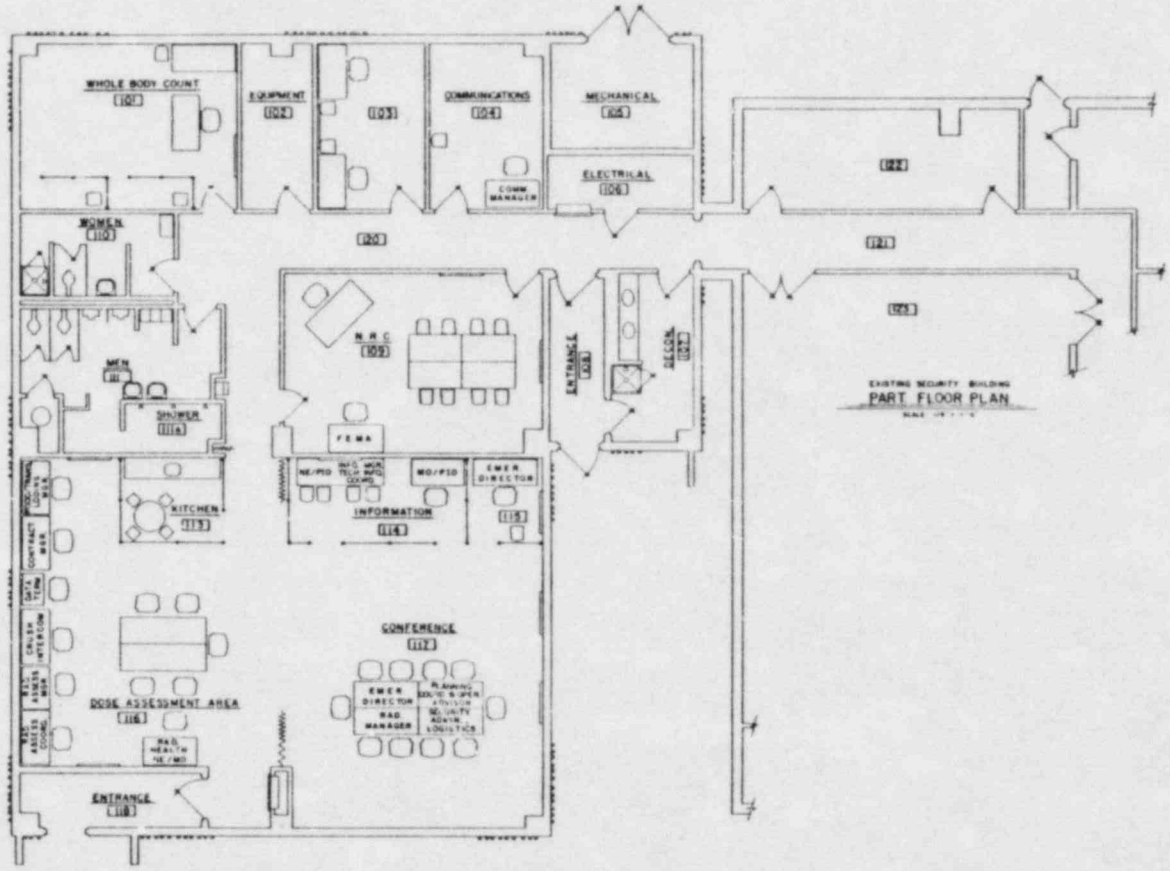
D. Attachment "D", Information Manager Checklist.

E. Attachment "E", Security/Administration/Logistics Manager Checklist.

F. Attachment "F", Communications Manager Checklist.

G. Attachment "G", Radiological Manager Checklist.

H. Attachment "H", Technical Information Coordinator Checklist.



COOPER NUCLEAR STATION
EMERGENCY OPERATIONS FACILITY
FIGURE T-5
ATTACHMENT "A"

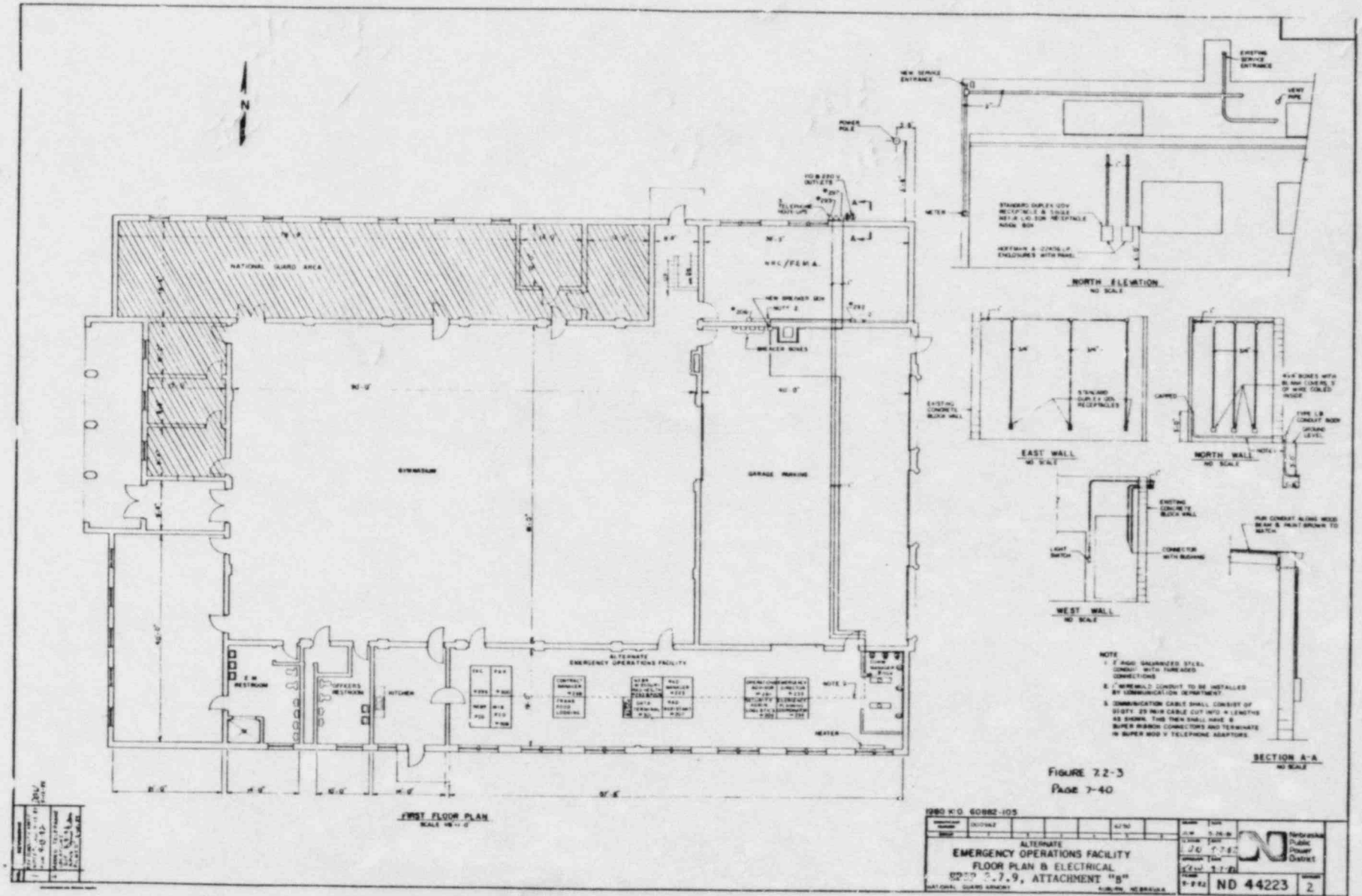


FIGURE 22-3
Page 7-40

1980 W.O. 60982-105

ALTERNATE
EMERGENCY OPERATIONS FACILITY
FLOOR PLAN & ELECTRICAL
SEISMIC 7.9, ATTACHMENT "B"
NATIONAL GUARD ARMORY — AUBURN, NEBRASKA

Nebraska Public Power District

ND 44223 2

MARCH 31 1983 N.P.P.D.

EMERGENCY DIRECTOR CHECKLIST

ACTION ITEMS	TIME/INITIALS
1. As dictated by the situation, contact the Shift Supervisor and/or the TSC Director and review as appropriate:	
a. The logic used to establish the classification of the event.	_____/_____
b. Status of plant conditions.	_____/_____
c. Status of notification to off-site agencies.	_____/_____
d. Recommended protective actions made to date and his knowledge of states' actions.	_____/_____
2. Upon reporting to the EOF, assume from the Shift Supervisor and/or the TSC Director the responsibilities for site response and communication with off-site agencies.	_____/_____
3. Notify the NPPD Division Manager of Power Operations of the declared EAL, if not already previously completed.	_____/_____
4. Contact the Security/Administration/Logistics Manager and verify that notification has been made to appropriate members of the emergency response organization and the following key assignments have been, or will shortly be, manned:	_____/_____

Emergency Title	Primary	Alternate
Emergency Director	Station Superintendent	Assistant to Station Superintendent
Emergency Planning Coordinator	Emergency Planning Coordinator	Q.A. Specialist
Operations Advisor	Day Shift Supervisor No. 1	Day Shift Supervisor No. 2
Radiological Manager	Chemistry and Health Physics Supervisor	Environmental Manager - G.O.
Radiological Assessment	Health Physicist Coordinator	Environmental Supervisor - G.O.

EMERGENCY DIRECTOR CHECKLIST

Emergency Title	Primary	Alternate
Security/Administration/ Logistics Manager	Administrative Supervisor	Administrative Assistant
Contract Support Manager	Nuclear Engineering Department Project Engineer - G.O.	Nuclear Engineering Department Mechanical Engineer - G.O.
Information Manager	Public Information Coordinator	Publications Supervisor
Communication Manager	Communications Engineering Supervisor - York	Communications Supervisor - York
Technical Information Coordinator	Electrical and Controls Supervisor - NED	Mechanical Engineering Supervisor - NED

ACTION ITEMS	TIME/INITIALS
5. Ensure that the Chemistry and Health Physics Coordinator has contacted the Nebraska Department of Health, Division of Radiological Health, and Missouri Division of Health and determined the status of implementation of any previously recommended protective actions.	_____/_____
6. When appropriate, declare the EOF operational.	_____/_____
7. Ensure that personnel have been assigned to evaluate plant conditions based on information available from the Control Room and ensure that the EOF Status Boards are updated as conditions change.	_____/_____
8. In conjunction with the Security/Administration/ Logistics Manager, review the personnel accountability reports as appropriate.	_____/_____
9. Authorize dispatch of rescue/re-entry teams as necessary.	_____/_____
10. In conjunction with the Radiological Manager, determine the need to evacuate non-essential personnel to off-site location (normally at a SITE AREA and/or GENERAL EMERGENCY and may have already been done in the TSC).	_____/_____

EMERGENCY DIRECTOR CHECKLIST

ACTION ITEMS	TIME/INITIALS
11. Authorize dispatch of on-site survey teams as necessary.	_____/_____
12. Authorize dispatch of off-site survey teams as necessary.	_____/_____
13. Maintain liaison with the Radiological Manager and review significant dose projection results.	_____/_____
14. In conjunction with the Radiological Manager, make protective action recommendations to affected off-site authorities as appropriate, considering existing plant conditions and potential degradation.	_____/_____
15. Authorize emergency exposure dose limits as necessary.	_____/_____
16. After the plant is restored to a safe condition ensure the appropriate portions of the Emergency Plan are deactivated and off-site personnel and agencies notified.	_____/_____
17. Provide verbal summary to the NPPD Division Manager of Power Operations and off-site authorities when emergency conditions are resolved and follow-up with a written summary within 8 hours.	_____/_____
18. In conjunction with appropriate members of the CNS Recovery Organization, determine long-term equipment and man-power needs.	_____/_____

PUBLIC INFORMATION MANAGER CHECKLIST

ACTION ITEMS	TIME/INITIALS
1. Contact the GOEC and determine status of the MRC.	_____/_____
2. From the GOEC, determine status of the past press releases; obtain copies via FAX.	_____/_____
3. Establish contact with the MRC; maintain contact with the GOEC/MRC.	_____/_____
4. Inquire of the Nebraska and Missouri Information Officers regarding any past state press releases.	_____/_____
5. Determine plant status from the Technical Information Coordinator.	_____/_____
6. Transit information to the GOEC/MRC on a timely basis.	_____/_____
7. Receive updated information from the Technical Information Coordinator on a timely basis.	_____/_____

SECURITY/ADMINISTRATION/LOGICTICS MANAGER CHECKLIST

ACTION ITEMS	TIME/INITIALS
1. Activate the Continuous Air Monitor.	_____/_____
2. Have the Security Shift Supervisor initiate personnel accountability by computer printout and check-off of personnel in the TSC, OCSs, and EOF. Conduct personnel accountability in the EOF and report all personnel accountability results to the Emergency Director.	_____/_____
3. Have the Security Shift Supervisor call in off-duty Security personnel as necessary for security functions.	_____/_____
4. Check with the EOF and station personnel to determine special needs concerning manpower and supplies.	_____/_____
5. Determine if adequate Logistics personnel are present to carry out duties.	_____/_____
6. Organize the Logistics staff and arrange to obtain any needed equipment, clerical services, and typewriters.	_____/_____
7. Receive additional equipment needed and issue to individuals requiring it.	_____/_____

COMMUNICATIONS MANAGER CHECKLIST*

ACTION ITEMS	TIME/INITIALS
1. Ensure that the communications equipment, stored in the emergency lockers, is set up in the EOF (see EPIP 5.7.22).	_____/_____
2. Check out the communications equipment for readiness.	_____/_____
3. Contact the TSC to determine any communications problems that need to be corrected or additional equipment needed.	_____/_____
4. Issue radios (low band) to off-site monitoring teams.	_____/_____

*Interim responsibility will be delegated to an on-site individual until the Communications Manager arrives.

RADIOLOGICAL MANAGER CHECKLIST

ACTION ITEMS	TIME/INITIALS
1. Ensure that all materials needed to perform assessments are available:	
a. Computerized dose assessment equipment.	_____/_____
b. Meteorological overlays.	_____/_____
c. Procedures and forms.	_____/_____
d. Radio for field team communications.	_____/_____
2. Ensure that the Continuous Air Monitor has been activated.	_____/_____
3. Determine that the staff on hand is adequate to perform necessary dose assessment functions and consists of at least the following:	
a. Radiological Assessment staff.	_____/_____
b. Off-Site Survey Teams 1 and 2.	_____/_____
4. Contact the Chemistry and Health Physics Coordinator in the TSC and determine:	
a. Any protective action recommendations made to date.	_____/_____
b. The location of on-site and off-site monitoring teams (if already dispatched).	_____/_____
5. Contact the Chemistry and Health Physics Coordinator in the TSC and inform him that the dose assessment function is being transferred to the EOF.	_____/_____
6. Notify the Emergency Director that the Radiological Assessment staff is ready to perform dose assessment and if the need arises determine protective action recommendations.	_____/_____
7. Ensure that appropriate data is being received and that the Radiological Status Board updated as necessary.	_____/_____
8. Activate the HEPA filters for the EOF as conditions dictate.	_____ _____

TECHNICAL INFORMATION COORDINATOR CHECKLIST

ACTION ITEMS	TIME/INITIALS
1. Establish initial contact with the GOEC and inform them of station status.	_____/_____
2. Establish initial contact with the MRC and inform them of station status.	_____/_____
3. Coordinate activities with the Information Manager and the Nebraska and Missouri Information Officers.	_____/_____
4. As appropriate, meet with the Emergency Director, Radiological Manager, and Operations Advisor to determine current station and radiological conditions (transmit information to the MRC/GOEC.	_____/_____

I. PURPOSE

A. This procedure describes the immediate emergency personnel assembly and accountability actions to be taken by all on-site personnel, security officers, contractors, and visitors in the event of a station emergency.

B. This procedure also provides a means to ascertain the names of missing individuals within 30 minutes and account for all on-site individuals continuously thereafter.

II DISCUSSION

A. In the event of an emergency situation at CNS, it is imperative that all personnel on-site are notified of the situation, their whereabouts identified for safety and security purposes, and that they respond in a coordinated effort to the emergency.

B. An emergency signal is provided to alert all personnel in the vicinity of the plant that an emergency exists. The emergency alarm signal may be activated manually from the Control Room. The emergency alarm consists of a distinct steady-tone signal sounded through the station and security area intercom system. The alarm shall be sounded for ten (10) seconds followed by an emergency announcement with directions for station personnel, visitors, and contractors. This announcement will be made twice. The alarm will then be reactivated for an additional one (1) minute.

C. Each site employee, security officer, visitor, and contractor is assigned a designated assembly area, and each area is assigned a supervisor. The Designated Assembly Area Supervisor (DAAS) shall notify the Security/Administration/Logistics (S/A/L) Coordinator of personnel accountability.

D. Upon arrival and check-in, CNS visitors receive instructions explaining what they are to do and where they are to go in the event of the sounding of the Site Emergency Alarm.

III. REFERENCE MATERIAL

A. CNS Emergency Plan.

B. NUREG 0654, Revision 1.

IV. PREREQUISITES

A. The Emergency Director declares that the station is in an ALERT, a SITE AREA EMERGENCY, or a GENERAL EMERGENCY status as defined in Emergency Procedure EPIP 5.7.1, Emergency Classification, or determines that personnel assembly and accountability is desirable.

V. LIMITATIONS

A. All individuals on-site at the time of the emergency must be accounted for and the names of missing individuals ascertained within 30 minutes of the start of the emergency and are accounted for continuously thereafter.

VI. PRECAUTIONS

A. It is the responsibility of each supervisor to know the general location of his subordinates at any time.

VII. EQUIPMENT

A. None.

VIII. PROCEDURE

A. Immediate Actions.

1. CNS personnel not engaged in initial emergency response actions shall report to their assigned assembly areas for accountability and further instructions in accordance with the following:

a. Operations Personnel - All CNS Operations personnel will report to the Control Room for an accountability check. After this is accomplished the Shift Supervisor will determine which personnel will remain in the Control Room; non-essential operations personnel will be dispatched to the I & C/Electrical OSC.

b. Mechanical Maintenance Personnel - All CNS Mechanical Maintenance personnel that do not have preassigned emergency response billets will report to the Mechanical Maintenance OSC which is located on the 903' elevation of the Machine Shop.

c. Chemistry/Health Physics Personnel - All CNS Chemistry/Health Physics personnel that do not have preassigned emergency response billets will report to the Chemistry and Health Physics OSC which is located on the 918' elevation of the Office Building in the Health Physics Office area.

d. I & C/Electrical Personnel - All CNS Electricians and I & C Technicians that do not have preassigned emergency response billets will report to the I & C/Electrical OSC which is located on the 932' 6" elevation of the Turbine Building in the Electric Shop.

2. Station security personnel shall respond as follows:

   a. Those assigned to the Central Alarm Station, the Secondary Alarm Station, and at the Security Access Point shall remain at their posts and await further instructions.

   b. Those on routine patrol shall report to the Security Building unless the emergency is security related. Under this condition security personnel shall follow the appropriate CNS security plan procedures.

3. All non-essential CNS personnel shall proceed to the Security Building exit and then to the auditorium for assembly.

4. CNS visitors, construction personnel, and contractor personnel shall evacuate to the Security Building Auditorium.

5. CNS escorted visitors shall be escorted to the Security Building and instructed to report to the auditorium. Accountability will be maintained by checking off those escorted visitors against the visitor sign-in log maintained at the Security Office. Escorts themselves will then proceed to their own emergency assembly areas.

B. Subsequent Actions.

1. The Security Shift Supervisor will ensure that the Security Access Point is manned.

2. The Security Shift Supervisor will obtain copies of the computer printout and of the Visitor Access Log which will provide a listing of all personnel who should be on site.

3. The Security Shift Supervisor will direct the CAS Operator to survey the owner controlled area (OCA) with the closed circuit television camera for personnel (farmers, boaters, line crews, etc.). Any activity will be reported to the S/A/L Coordinator. Individuals in the OCA or entering the OCA will be requested to depart the area, conditions permitting.

4. The DAAS for the Control Room, TSC, OSCs, and EOF obtains a copy of the Area Roster Sheet which contains the names and badge numbers of all individuals who should have reported to the area. Utilizing the information contained on the Roster Sheet, he determines if any individuals are missing; if this situation exists the DAAS fills out Attachment "A". The DAAS then calls the S/A/L Coordinator and informs him that all personnel are accounted for or that a person(s) is (are) missing.

5. All non-essential personnel, visitors, contractors, etc. will report to the DAAS in the Security Building Auditorium. The DAAS utilizing a copy of the Visitor Access Log will determine accountability of the visitors present. He will then contact the S/A/L Coordinator and inform him of all personnel assembled.

6. If individuals are not accounted for, the S/A/L Coordinator has the individuals' names announced over the station intercom system, requesting response. If there is no response, a rescue and re-entry operation will be performed in accordance with EPIP 5.7.15, Rescue And Re-Entry.

7. The S/A/L Coordinator completes the Summary Of Personnel Accountability And Assignments Log Sheet, Attachment "B", and forwards the completed attachment to the Emergency Director.

8. The S/A/L Coordinator will inform the Emergency Director of accountability within 30 minutes of the start of the emergency.

C. On-Going Accountability.

1. In general, the Emergency Director will order any necessary relocations or evacuations of assembly areas as appropriate. The DAAS for each area may relocate personnel if deemed necessary for personnel safety (e.g. if the Area Alarm Monitor and/or the Continuous Air Monitor alarms and the results of the habitability survey indicate that the TSC, OSCs, or EOF should be evacuated).

2. Additional personnel required for emergency response will be relocated, on order of the Emergency Director, to an Operational Support Center to await job assignment.

3. Non-CNS personnel will be granted access to the station only on the authorization of the Emergency Director.

D. Assembly Areas.

The first person listed in each group below is designated as the primary DAAS to be responsible for the accountability of personnel at each assembly area. Using a telephone or a runner he shall inform the S/A/L Coordinator of the status of his area as soon as practicable.

1. Control Room.

a. Shift Supervisor (Emergency Director).

b. Assistant to Station Superintendent.

c. Operations Supervisor.

d. Control Room Operators.

e. Station Operators.

f. Other Operations personnel.

g. Resident NRC Inspector.

2. Technical Support Center.

   a. Administrative Supervisor (S/A/L Coordinator).

   b. Station Superintendent (Emergency Director) (for ALERT).

   c. Emergency Planning Coordinator (for ALERT).

   d. Engineering Supervisor (Engineer Coordinator for ALERT, TSC Director for higher level classification).

   e. Reactor Engineer (Engineering Coordinator for SITE AREA EMERGENCY and above).

   f. Maintenance Supervisor (Maintenance and OSC Coordinator).

   g. Administrative Assistant (Administrative Coordinator for SITE AREA EMERGENCY and above).

   h. Chemistry and Health Physics Supervisor (Chemistry and Health Physics Coordinator for ALERT).

   i. Health Physicist.

   j. Plant Chemist (Chemistry/Health Physics Coordinator for SITE AREA EMERGENCY and above).

   k. Dose Assessment Clerk.

   l. Maintenance Planner and Scheduler.

   m. Mechanical Engineer.

   n. Electrical Engineer.

   o. I/C Engineer.

   p. Engineering Technician (Technical Data Technician).

3. I & C/Electrical OSC.

   a. Electrical Foreman (OSC Supervisor).

   b. I & C Supervisor.

   c. All on-site Electricians.

   d. All on-site I & C Technicians.

   e. Relocated Operations personnel.

4. Mechanical Maintenance OSC.

   a. Mechanical Supervisor (OSC Supervisor).

   b. Mechanical Foremen.

   c. All on-site Mechanics.

   d. Mechanical Maintenance Utility Personnel.

5. Chemistry and Health Physics OSC.

   a. Lead Health Physics Technician (OSC Supervisor in ALERT).

   b. All on-site Chemistry Technicians.

   c. All on-site Health Physics Technicians.

6. Security Building Auditorium.

   a. Administration, Q.A., TC personnel not designated above.

   b. All Engineers not designated in Step 2. above.

   c. All visitors, contractors, construction personnel.

   d. All other on-site personnel not designated.

7. Emergency Operations Facility.

   a. Administrative Supervisor (S/A/L Manager).

   b. Station Superintendent (Emergency Director).

   c. Emergency Planning Coordinator.

   d. Chemistry and Health Physics Supervisor (Radiological Manager).

   e. Day Shift Supervisor No. 1 (Operations Advisor).

   f. Health Physicist (Radiological Assessment Coordinator).

   g. Public Information Manager (Information Manager).

   h. Electrical and I & C Engineering Supervisor (Technical Information Coordinator).

   i. Communications Specialist (Communications Manager).

   j. General Office Project Engineer (Contract Support Manager).

   k. Purchasing Manager (Transportation/Food/Lodging Coordinator).

D. Miscellaneous.

1. If an emergency occurs during an evening, or on a weekend or holiday, the same areas used during working hours shall be utilized. However, personnel who are off-site at the time of the emergency and are notified to report to the site to assist in recovery operations shall be instructed as to where they should report when notified. If no instructions are given, personnel reporting to the site shall proceed immediately to the Security Building.

IX. ATTACHMENTS

A. Attachment "A", Individual Accountability Sheet.

B. Attachment "B", Personnel Accountability And Assignments Summary.

INDIVIDUAL ACCOUNTABILITY SHEET

AREA ACCOUNTABILITY SUPERVISOR: _____ DATE: _____

MISSING INDIVIDUALS		
NAME	BADGE NUMBER	REMARKS (LAST KNOWN WHEREABOUTS)

PERSONNEL ACCOUNTABILITY AND ASSIGNMENTS SUMMARY

BY: _____ _____ DATE: _____

INITIAL PERSONNEL ACCOUNTABILITY

Control Room

Conducted By: _____
Report In At: _____ Hours; Number Of People: _____
Missing: _____
Injured: _____
Remarks: _____

Technical Support Center

Conducted By: _____
Report In At: _____ Hours; Number Of People: _____
Missing: _____
Injured: _____
Remarks: _____

Mechanical Maintenance OSC

Conducted By: _____
Report In At: _____ Hours; Number Of People: _____
Missing: _____
Injured: _____
Remarks: _____

I & C/ Electrical OSC

Conducted By: _____
Report In At: _____ Hours; Number Of People: _____
Missing: _____
Injured: _____
Remarks: _____

PERSONNEL ACCOUNTABILITY AND ASSIGNMENTS SUMMARY

Chemistry And Health Physics OSC	Conducted By: _____ Report In At: _____ Hours; Number Of People: _____ Missing: _____ Injured: _____ Remarks: _____
Security Building Auditorium	Conducted By: _____ Report In At: _____ Hours; Number Of People: _____ Missing: _____ Injured: _____ Remarks: _____
EOF	Conducted By: _____ Report In At: _____ Hours; Number Of People: _____ Missing: _____ Injured: _____ Remarks: _____

I. PURPOSE

This procedure describes methodology for the manual determination of airborne radioactive release rates from the Elevated Release Point (Reactor Building), the Turbine Building vents, and the Augmented Radwaste Building vents, utilizing effluent monitor readings.

II. DISCUSSION

The best method for estimating release rates is through the utilization of count rates (CPM) and flow rates (CFM). Upon determination of release rates, actual or projected plume exposure doses may be calculated in accordance with EPIP 5.7.17, Dose Assessment. These doses provide a basis for relating plume exposure doses to the EPA Protective Action Guides (PAGs) in accordance with EPIP 5.7.20, Protective Action Guides.

This procedure outlines the steps for determining release rates from the ERP, Turbine Building, and Augmented Radwaste using effluent monitoring data. It also outlines the steps for determining release rates at the ERP using in-containment radiation monitors. Section F. discusses liquid release activity calculations. In addition, this procedure references other sampling procedures for determining release rates.

III. REFERENCE MATERIAL

A. CNS Emergency Plan.

B. NUREG 0654, Revision 1.

C. NUREG 0737.

IV. PREREQUISITES

A. An ALERT or higher level emergency has been declared in accordance with EPIP 5.7.3, EPIP 5.7.4, or EPIP 5.7.5.

B. An actual or projected release of radioactive material from the ERP, the Turbine Building, or the Augmented Radwaste Building has occurred, or has the potential of occurring.

V. LIMITATIONS

A. None.

VI. PRECAUTIONS

A. Determination of ERP release rates using the primary containment monitors (Section D.) should be used only if the calculation cannot be performed utilizing the ERP noble gas effluent monitor readings.

The ERP releases can be calculated by correlating the exposure rates on high range radiation monitor in the drywell to those which have been calculated assuming a Design Basis Loss of Coolant Accident (LOCA). The LOCA calculations are based on the NUREG-0737 assumptions that of the maximum full power equilibrium isotopic inventories, 100% of the noble gases, 25% of the halogens, and 1% of the remaining radionuclides are instantaneously released to the atmosphere of the primary containment. The leak rate from the primary containment was assumed to be .105 Volume/Day (10.6 CFM). The secondary containment purge rate was assumed to be 100% Volume/Day. The entire release is assumed to be through the SGT system and out the ERP.

B. Dose projections calculated using this procedure should be evaluated utilizing field monitoring data, ERP radioiodine filter data, and other relevant data as it becomes available.

C. Release rates should be determined upon significant changes ± 20% in monitor readings and at a minimum of every hour for effective ages 0 to 10 hours and every 10 hours for effective ages 10 to 100 hours.

VII. EQUIPMENT

A. Effluent monitors.

B. In-containment high radiation area monitors.

VIII. PROCEDURES

A. Elevated Release Point Effluent Monitor Release Rate Determination (For ERP Release Using Containment Monitor Proceed To Section D.).

1. Determine the count rate of the release from the ERP monitor and record this value on Attachment "A", Column 2.

2. Using the conversion factor for the ERP, determine the release in µCi/Sec per CFM vs. Count Rate. Record this value on Attachment "A", Column 3. Also be aware SJAE calibration curve µCi/Sec per CFM vs. mR/Hr may be used if the ERP monitor is not functional.

3. Determine the ERP flow rate in CFM and record on Attachment "A", Column 4.

   a. If the ERP flow rate monitor or the SGT flow rate monitor is not operating, estimate the flow rate by obtaining individual fan flow rates.

1) Determine the number of fans operating at 1780 CFM. Multiply the number of fans by 1780 CFM.

2) Obtain the dilution fan flow rate (CFM) if operating.

3) Sum the flow rates (CFM) from the dilution fans and the SGT fans.

4. Determine the time after shutdown when the release determination is being made and record on Attachment "A", Column 1.

5. Using Attachment "G" and the amount of time since shutdown, determine decimal fraction of radioiodines to release rate of noble gases and record in Attachment "A", Column 7.

6. Using math computations on Attachment "A", determine the release rate of noble gases and total iodines.

   These calculations are as follows:

   $R \times F = RR_{NG}$

   $R \times F \times C_1 = RR_{TI}$

   Where:

   R = Release in Ci/Sec per CFM.

   F = ERP flow rate in CFM.

   C_1 = Decimal of noble gas release which is radioiodines as a function of time after shutdown.

   RR_{NG} = Noble gas release rate (Ci/Sec).

   RR_{TI} = Total radioiodine release rate (Ci/Sec).

7. If necessary, calculate the I-131 release rate (Ci/Sec) using Attachment "F", I-131 Release Rate Determination.

B. Turbine Building Release Rate Determination.

1. Determine the count rate of the release from the Turbine Building vent monitor and record this value on Attachment "B", Column 2.

2. Using the Calibration Curve for the Turbine Building vent monitor, determine the release in Ci/Sec per CFM and record this value on Attachment "B", Column 3.

3. Determine the Turbine Building vent flow rate in CFM and record on Attachment "B", Column 4.

a. If the Turbine Building vent flow monitor is not operating, estimate the flow rate by obtaining individual fan flow rates.

1) Determine the number of fans operating and multiply the number of fans by 50,710 CFM.

4. Determine the time after shutdown when the release determination is being made and record on Attachment "B", Column 1.

5. Using Attachment "G" and the amount of time since shutdown, determine the decimal fraction of radioiodines to release rate of noble gases and record on Attachment "B", Column 6.

6. Using the math computations on Attachment "B", determine the release rate of noble gases and total iodines.

These calculations are as follows:

$R \times F = RR_{NG}$

$R \times F \times C_1 = RR_{TI}$

Where:

R = Release in Ci/Sec per CFM.

F = Turbine Building vent flow rate in CFM.

C_1 = Decimal of noble gas release which is radioiodines as a function of time after shutdown.

RR_{NG} = Noble gas release rate (Ci/Sec).

RR_{TI} = Total radioiodine release rate (Ci/Sec).

7. If necessary, calculate the I-131 release rate (Ci/Sec) using Attachment "F", I-131 Release Rate Determination.

C. Augmented Radioactive Waste Release Rate Determination.

1. Determine the count rate of the release from the Augmented Radwaste vent monitor and record this value on Attachment "C", Column 2.

2. Using the Calibration Curve for the Augmented Radwaste vent monitor, determine the release in Ci/Sec per CFM and record this value on Attachment "C", Column 3.

3. Determine the Augmented Radwaste vent flow rate in CFM and record the value on Attachment "C", Column 4.

a. If the Augmented Radwaste vent flow monitor is not operating, estimate the flow rate by obtaining individual fan flow rates.

1) Determine the number of fans operating and multiply the number of fans by 16,000 CFM.

4. Determine the time after shutdown when the release determination is being made and record on Attachment "C", Column 1.

5. Using Attachment "G" and the amount of time since shutdown, determine the decimal fraction of radioiodines to release rate of noble gases and record on Attachment "C", Column 6.

6. Using the math computations on Attachment "C" determine the release rate of noble gases and total iodines.

   These calculations are as follows:

   $R \times F = RR_{NG}$

   $R \times F \times C_1 = RR_{TI}$

   Where:

   R = Release in Ci/Sec per CFM.

   F = Augmented Building vent flow rate in CFM.

   C_1 = Decimal of noble gas release which is radioiodines as a function of time after shutdown.

   RR_{NG} = Noble gas release rate (Ci/Sec).

   RR_{TI} = Total radioiodine release rate (Ci/Sec).

7. If necessary, calculate the I-131 release rate (Ci/Sec) using Attachment "F", I-131 Release Rate Determination.

D. Elevated Release Point Primary Containment Monitor Release Rate Determination.

   Note: This method should be used if the release rates cannot be calculated using the ERP noble gas effluent monitor method in Section A. of this procedure.

1. Determine the exposure rates on the high range in-containment radiation monitor in R/Hr and record this value on Attachment "D", Column 2.

2. Determine time after shutdown release determination is being made and record on Attachment "D", Column 1.

3. Determine the DBA-LOCA exposure rate as a function of effective age from Attachment "I" and record this value on Attachment "D", Column 3.

4. Determine the DBA-LOCA noble gas release rate as a function of effective age from Attachment "J" and record this value on Attachment "D", Column 4.

5. Using Attachment "G", Radioiodines To Noble Gases Vs. Time Relative Release Rates, and the amount of time since shutdown, determine decimal fraction of total iodines and record in Attachment "D", Column 6.

6. Using the math computation on Attachment "D", determine the release rate of noble gases and total iodines.

   These calculations are as follows:

   $CD/DL \times RR_{NGLOCA} = RR_{NG}$

   $CD/DL \times RR_{NGLOCA} \times C_1 = RR_{TI}$

   Where:

   CD = Drywell high range radiation monitor reading.

   DL = Drywell exposure rate at effective age (R/Hr) from DBA-LOCA.

   RR_{NGLoca} = Noble gas release rate at effective age (Ci/Sec) from DBA-LOCA.

   C_1 = Decimal of noble gas release which is radioiodines as a function of time after core shutdown.

   RR_{NG} = Noble Gas release rate (Ci/Sec).

   RR_{TI} = Total radioiodine release rate (Ci/Sec).

7. If necessary, calculate the I-131 release rate (Ci/Sec) using Attachment "F", I-131 Release Rate Determination.

E. Drywell Curie Content And Release Rate Activity From Controlled Venting Determination.

1. Determine the exposure rates on the high range in-containment radiation monitor in R/Hr and record this value on Attachment "E", Column 2.

2. Determine time after shutdown release determination is being made and record on Attachment "E", Column 1.

3. Determine the DBA-LOCA exposure rate as a function of effective age from Attachment "I" and record this value on Attachment "E", Column 3.

4. Determine the DBA-LOCA noble gas drywell curie content as a function of effective age from Attachment "K" and record this value on Attachment "E", Column 4.

5. Determine the control venting flow rate in CFM and record on Attachment "E", Column 8.

6. Using Attachment "G", Radioiodines To Noble Gases Vs. Time Relative Release Rates, and the amount of time since shutdown, determine decimal fraction of total iodines and record on Attachment "E", Column 10.

7. Using the math computation on Attachment "E", determine the drywell noble gas curie content and the release rate of noble gases and total iodines.

   Note: If the release is not through the standby gas treatment system, multiply the total iodine release rates by 100.

   These calculations are as follows:

   $CD/DL \times NG_{Drywell\ LOCA} = NG_{Drywell}$

   $NG_{Drywell} \div \text{Drywell Volume} = NG_{Drywell}\ \text{Concentration}$

   $NG_{Drywell}\ \text{Concentration} \times F = RR_{NG}$

   $RR_{NG} \times C_1 = RR_{TI}$

   Where:

   CD = Drywell high range radiation monitor readings (R/h).

   DL = Drywell exposure rate at effective age (R/h) from DBA-LOCA.

   $NG_{Drywell}$ = Drywell noble gas curie content (Ci).

   $NG_{Drywell}$ Concentration - Drywell noble gas concentration (Ci/ft^3).

   F = Controlled venting flow rate (CFM).

   RR_{NG} = Noble gas release rate (Ci/Sec).

   C_1 = Decimal of noble gas release which is radioiodines as a function of time after core shutdown.

   RR_{TI} = Total radioiodine release rate (Ci/Sec).

8. If necessary, calculate the I-131 release rate (Ci/Sec) using Attachment "F", I-131 Release Rate Determination.

F. Procedure For Determination Of Liquid Release Rate Activity.

1. Use the previous inventory concentrations, if known, or assume a concentration of 1×10^{-2} µCi/ml during normal operation.

2. If river flow is not known, assume low river flow of 6.8×10^{6} Gal/Min.

3. Calculate the downstream concentration by using the formula:

$$\frac{\text{Gal Disch/Length of Disch (or Disch Rate)}}{\text{River Flow - GPM}} = \text{Dilution Factor}$$

Note: $Ft^3/Sec \times 60\ Sec/Min \times 7.48\ Gal/Ft^3 = GPM$

$L/Min \times .264\ Gal/L = GPM$

Dilution Factor x Discharge Concentration µCi/cc = µCi/cc Downstream Concentration.

4. When samples have been collected, update information and relay to the Emergency Director, or if so directed to the State Radiological Health Department.

G. Emergency Sampling For Release Rate Activity.

1. Noble gas, particulate, and iodine release rates may be determined by sample collections from the effluent release path and subsequent analysis of these samples in the Radiochemistry Laboratory (refer to Chemistry Procedure 8.4.1.2, Emergency Sampling Gaseous Release, for details of sample collection). Approval from the Radiological Manager/Coordinator must be obtained before this procedure may be implemented.

2. In-containment activities, both liquid and gaseous, may also be obtained to determine release concentration if the release path is from containment (refer to Chemistry Procedure 8.4.1.1, Post Accident Sampling System Reactor Coolant And Containment Atmosphere Sampling). Approval from the Radiological Manager/Coordinator must be obtained before this procedure may be implemented.

3. If necessary, calculate the I-131 release rate (Ci/Sec) using Attachment "F", I-131 Release Rate Determination.

IX. ATTACHMENTS

A. Attachment "A", Elevated Release Point Effluent Monitor Release Rate Determination.

B. Attachment "B", Turbine Building Release Rate Determination.

C. Attachment "C", Augmented Radioactive Waste Release Rate Determination.

D. Attachment "D", Elevated Release Point Primary Containment Monitor Release Rate Determination.

E. Attachment "E", Drywell Curie Content And Release Rate Activity Determination.

F. Attachment "F", I-131 Release Rate Determination.

G. Attachment "G", Radioiodines To Noble Gases Vs. Time Relative Release Rates.

H. Attachment "H", I-131/Total Radioiodines To Noble Gases Vs. Time Release Rates.

I. Attachment "I", Drywell Dose Rate Vs. Time.

J. Attachment "J", Noble Gas Release Rate Vs. Time.

K. Attachment "K", Drywell Noble Gas Curie Content Vs. Time.

ELEVATED RELEASE POINT EFFLUENT MONITOR RELEASE RATE DETERMINATION

Effective Age (Hr) (1)	Release Rate (CPS) (2)	µCi/Sec Per CFM (3)	x	ERP Flow Rate (CFM) (4)	x	Conversion Factor µCi To Ci (5)	=	RR(NG) Ci/Sec (6)	x	Relative Total Iodine (Att "G") (7)	=	Relative Rate RR(TI) Ci/Sec (8)
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	
			x		x	1.0 E-6	=		x		=	

TURBINE BUILDING RELEASE RATE DETERMINATION

Effective Age (Hr) (1)	Count Rate (CPM) (2)	Ci/Sec Per CFM (3)	x	Turbine Building Vent Flow Rate (CFM) (4)	=	RR(NG) Ci/Sec (5)	x	Relative Total Iodine (Att "G") (6)	=	Release Rate RR(TI) Ci/Sec (7)
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	

AUGMENTED RADIOACTIVE WASTE RELEASE RATE DETERMINATION

Effective Age (Hr) (1)	Count Rate (CPM) (2)	Ci/Sec Per CFM (3)	x	Augmented Vent Flow Rate (CFM) (4)	=	RR(NG) Ci/Sec (5)	x	Relative Total Iodine (Att "G") (6)	=	Release Rate RR(TI) Ci/Sec (7)
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	
			x		=		x	(100)	=	

ELEVATED RELEASE POINT USING PRIMARY CONTAINMENT MONITOR RELEASE RATE DETERMINATION

Effective Age (Hr) (1)	Actual Containment Exposure Rate (R/Hr) (2)	÷	Exposure Rate At Effective Age (R/Hr) (Att "I") (3)	x	Noble Gas Release Rate (Ci/Sec) (Att "J") (4)	=	RR(NG) (Ci/Sec) (5)	x	Relative Total Iodine (Att "G") (6)	=	Release Rate RR(TI) (Ci/Sec) (7)
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	
		÷		x		=		x		=	

DRYWELL CURIE CONTENT AND CONTROLLED VENTING RELEASE RATE ACTIVITY DETERMINATION

Effect Age (Hr) (1)	Actual Contain Exposure Rate (R/Hr) (2)	÷	Exposure Rate At Effect Age (R/Hr) (3)	x	Project Noble Gas Curie Content (Ci) (4)	=	Actual Drywell Noble Gas Curie Content (Ci) (5)	÷	Drywell Volume (Ft^3) (6)	=	Drywell Noble Gas Conc (Ci/Ft^3) (7)	x	Control Venting Flow Rate CFM (8)	=	RR(NG) (Ci/Sec) (9)	x	Relative Total Iodine (10)	=	RR(TI) (Ci/Sec) (11)
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	
		÷		x		=		÷	1.45 E5	=		x		=	(2)*	x		=	

Note: If the release is not through the standby gas treatment system, multiply the total iodine release rates by 100.

Note: 1 Ci/Ft^3 x 0.28 = Ci/m^3 and 1 Ci/m^3 = 1 μCi/cc.

*If release in from primary containment, mutiply by 2 for 50% iodines. If release is from secondary containment, do not mutiply by 2 to reflect 25% iodines.

I-131 RELEASE RATE DETERMINATION

1. Obtain the total iodine release rates, Ci/Sec (from Section A., B., C., or D. of this procedure), and record in Column 2 below.

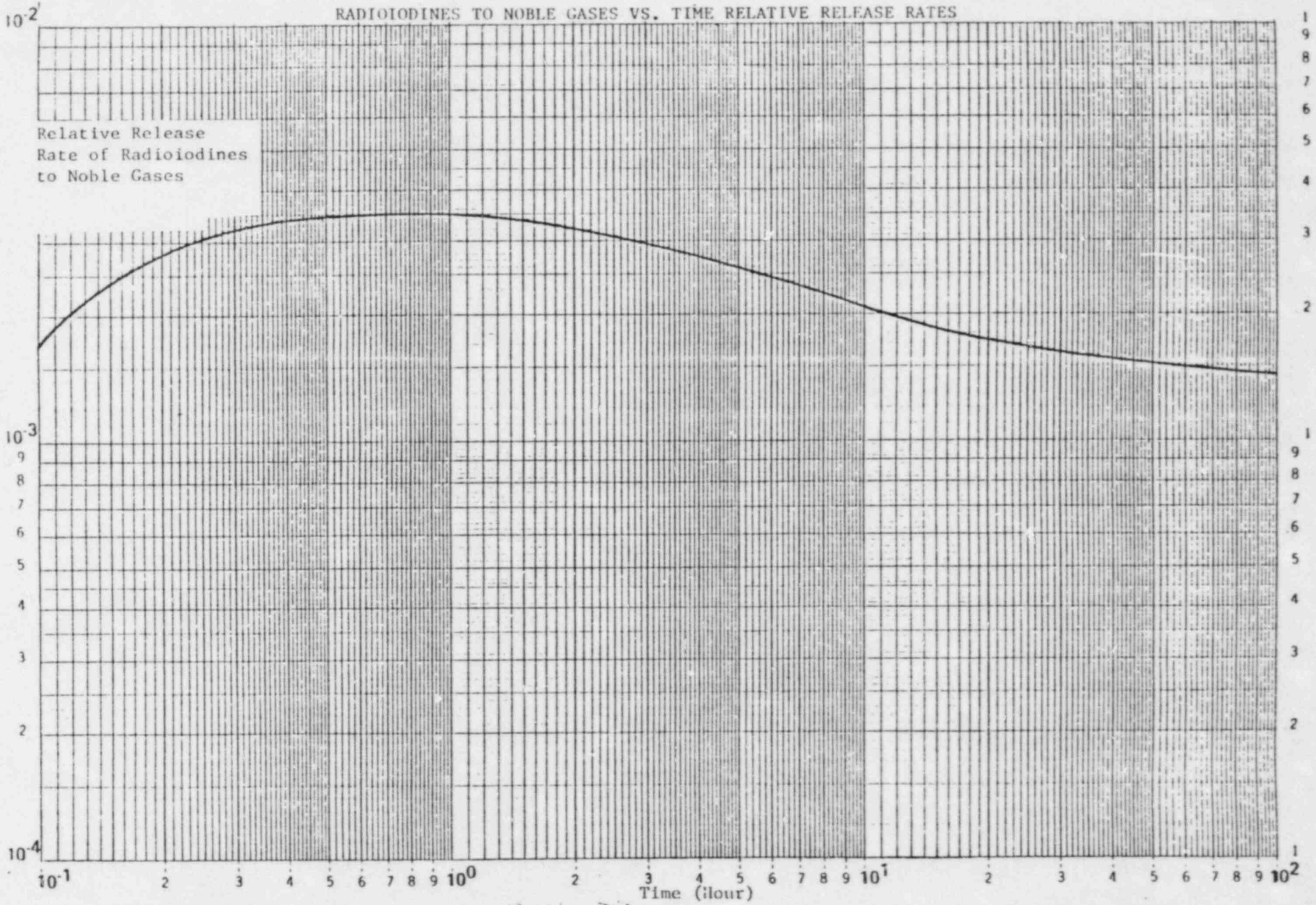
   a. Record the corresponding effective age in Column 1 below.

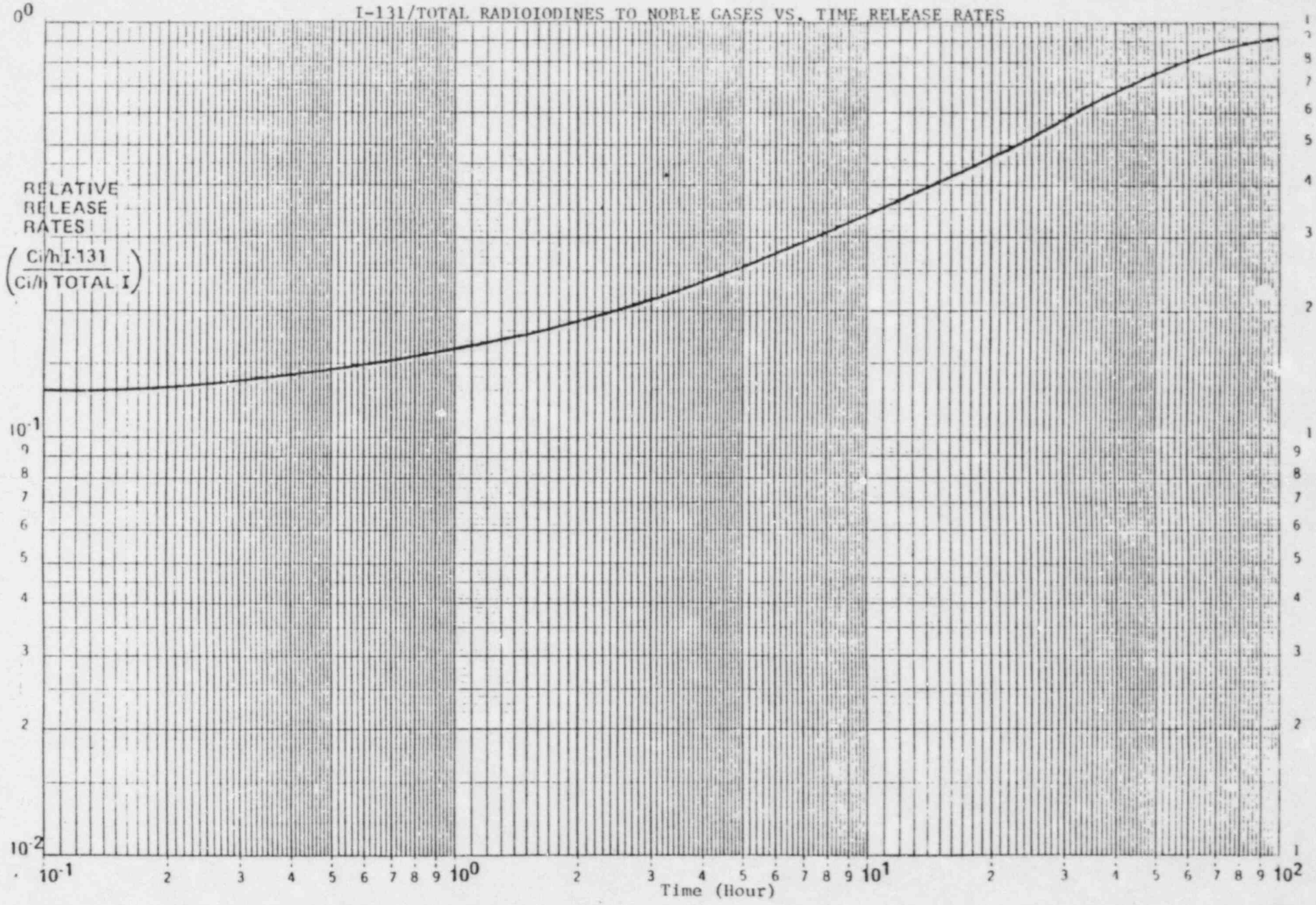
2. Using Attachment "H" and the effective age at the time of the total iodine release rate determination determine the decimal fraction of I-131 to total iodines released and record in Column 3.

3. Complete the math computations below.

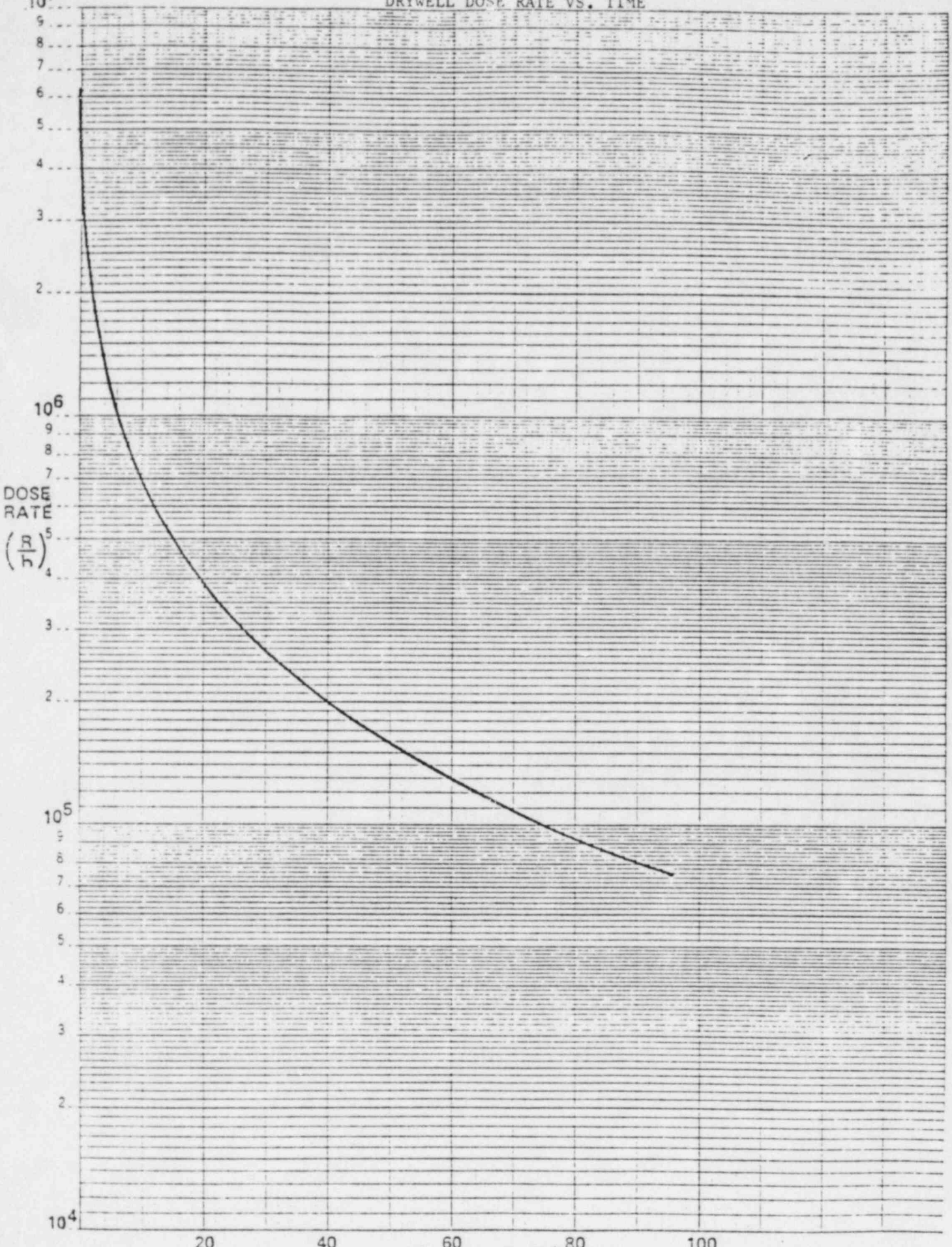
Effective Age (Hr) (1)	Total Iodine Release Rate (Ci/Sec) (2)	x	I-131 Relative Release Rate (Attach "H") (3)	=	I-131 Release Rate (Ci/Sec) (4)
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	
		x		=	

RADIOIODINES TO NOBLE GASES VS. TIME RELATIVE RELEASE RATES

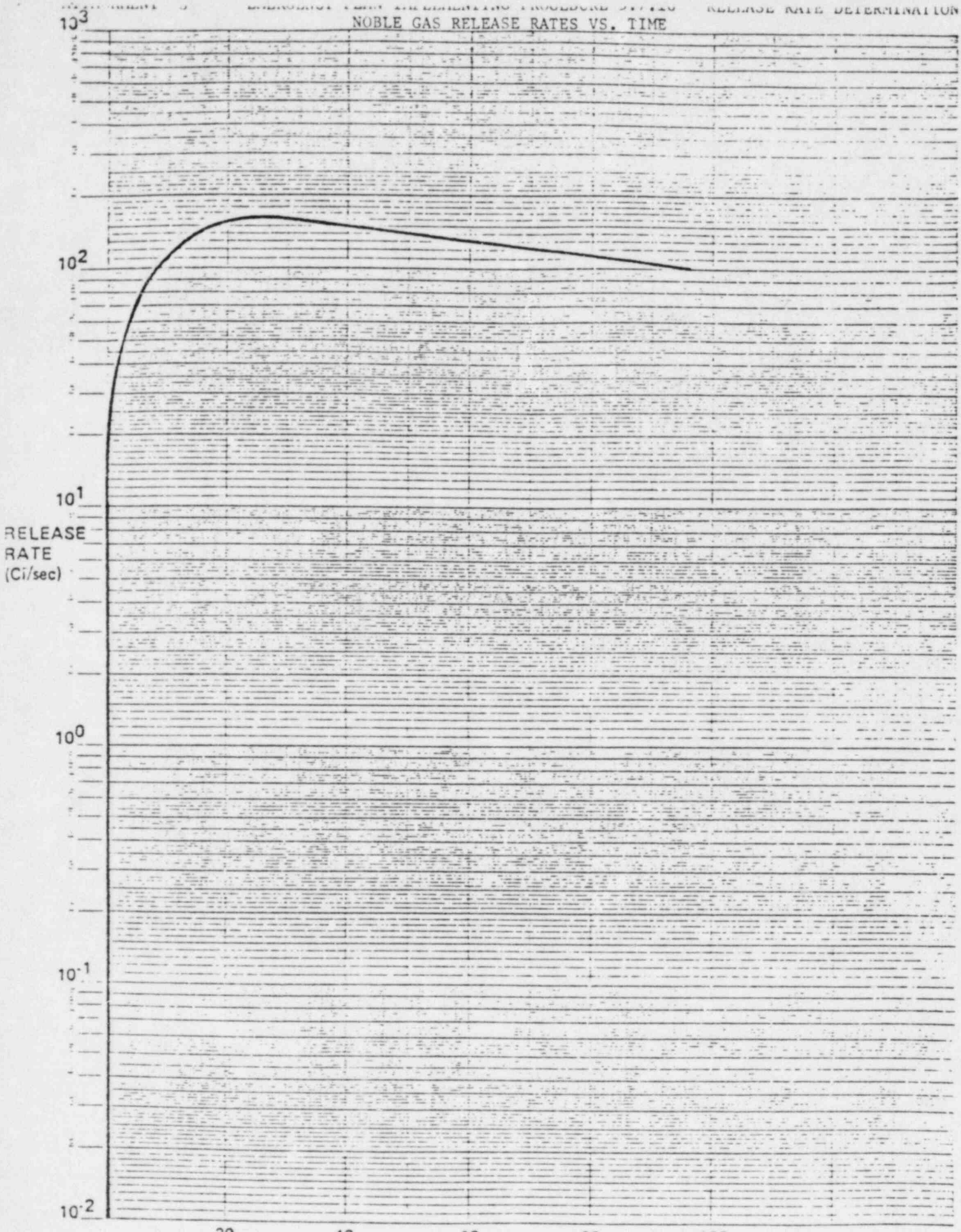


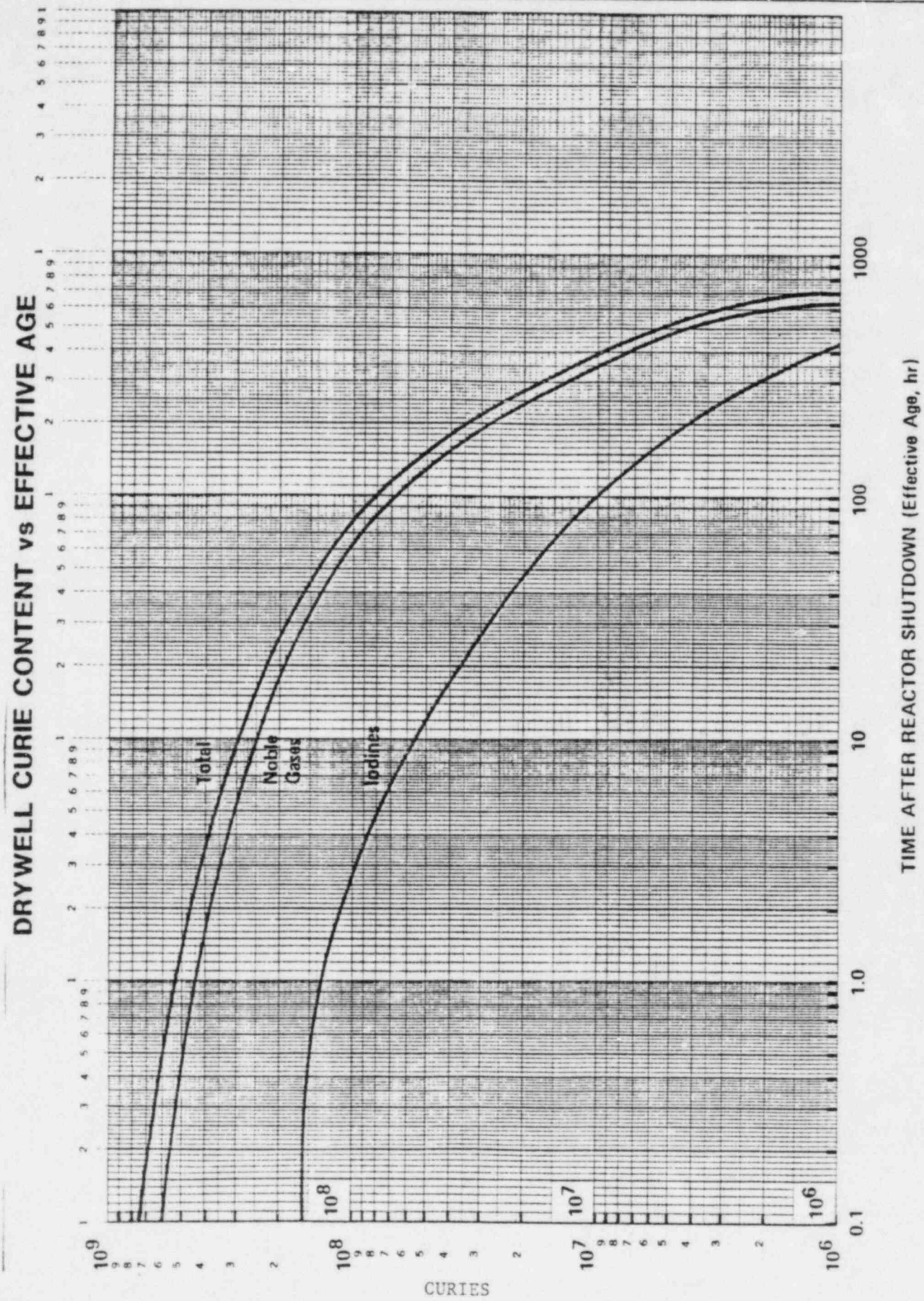

I-131/TOTAL RADIOIODINES TO NOBLE GASES VS. TIME RELEASE RATES
RELATIVE RELEASE RATES
(Ci/h I-131 / Ci/h TOTAL I)
Time (Hour)

DRYWELL DOSE RATE VS. TIME



NOBLE GAS RELEASE RATES VS. TIME




DRYWELL CURIE CONTENT vs EFFECTIVE AGE
TIME AFTER REACTOR SHUTDOWN (Effective Age, hr)
CURIES
Total
Noble Gases
Iodines
1000
100
10
1.0
0.1
10^9
10^8
10^7
10^6

I. PURPOSE

To provide an outline of procedures for the proper physical set up of equipment and operating instructions for the computerized NPPD Emergency Preparedness - Atmospheric Dispersion Model - Interim Version.

Should this program become inoperable, a manual backup system will be utilized. Therefore, this procedure also provides instructions and calculations necessary to predict off-site dose rates and integrated doses based upon actual meteorological data, release rates, and dispersion factor overlays.

This procedure also provides means for on shift personnel to quickly predict off-site dose rates and integrated doses based on meteorological data, release rates, and dispersion until emergency personnel arrive to use the more accurate computerized or manual backup method of dose assessment.

II. DISCUSSION

This procedure is intended to:

A. Ensure the proper physical set up of the appropriate computer terminals in the proper locations.

B. Provide personnel with appropriate instructions in the use of the computer terminals in order to successfully run the Atmospheric Dispersion Model - Interim Version.

C. Provide a manual backup means of adequately addressing dose assessment should the computerized model be inoperable or unavailable.

D. Section VIII. of this procedure is divided into three parts:

1. Part A. describes the operation of the computerized dose assessment model.

2. Part B. describes the hand calculated dose assessment method, should the computerized model fail.

3. Part C. describes a method that may be used by on-shift personnel to quickly establish a conservative dose assessment.

III. REFERENCE MATERIAL

A. Users Guide for EPM2 - Emergency Preparedness Atmospheric Dispersion Model; prepared by Dames & Moore.

B. NRC Regulatory Guide 1.145, August 1979, Atmospheric Dispersion Models For Potential Accident Consequence Assessments At Nuclear Power Plants.

C. NRC Regulatory Guide 1.111, July 1977, Methods For Estimating Atmospheric Transport And Dispersion Of Gaseous Effluents In Routine Releases From Light-Water-Cooled Reactors.

D. NRC Regulatory Guide 1.109, Revision 1, October 1977, Calculation Of Annual Doses To Man From Routine Releases Of Reactor Effluents For The Purpose Of Evaluating Compliance With 10CFR50, Appendix I, Iodine Inhalation Dose Factors.

E. Health Physics Journal, November 1981, Noble Gas Dose Rate Conversion Factors.

F. ICRP 59, Working Breathing Rate.

IV. PREREQUISITES

A. A release of airborne radioactive material has occurred or has the potential of occurring.

V. LIMITATIONS

A. Release Rate Determinations must be conducted in accordance with EPIP 5.7.16, Release Rate Determination.

VI. PRECAUTIONS

A. Actual dose rates will vary as a function of:

1. The total curies released (varies with time).

2. Release rate (varies with time).

3. The duration of the release.

4. The isotopic mixture of the release.

5. Meteorological conditions.

B. Update and refine dose assessments for critical receptor sites upon significant changes in one or more of the above parameters.

C. Should a release occur which necessitates rapid decision making concerning the recommendation of protective actions, the guidance contained in EPIP 5.7.20 should be followed.

VII. EQUIPMENT

A. Technical Support Center (TSC).

1. Texas Instruments T.I. 820 Printer, Hard-Copy Terminal.

2. Two RACAL-VADIC-VA3451P MODEMS, 300/1200 Baud.

3. RS-232 DATA SPLITTER.

4. Two standard telephones; at least one must have microwave and outside commercial telephone access.

5. Appropriate wiring harnesses for the proper connection of the terminals and modems.

6. Appropriate amounts of continuous Data Form paper for the hard-copy terminal (Printer).

B. Emergency Operations Facility (EOF)

1. Texas Instruments T.I. 820 Printer, Hard-Copy Terminal.

2. One RACAL-VADIC-VA3451P MODEM, 300/1200 Baud.

3. Two standard telephones; at least one must have microwave and outside commercial telephone access.

4. Appropriate wiring harnesses for the proper connection of the terminal and modem.

5. Appropriate amount of continuous Data Form paper for the hard-copy terminal (Printer).

C. Hand Calculations.

1. Environs Map.

2. Atmospheric Dispersion Overlays.

VIII. PROCEDURE

A. Computerized Dose Assessment.

1. Physical set up of equipment.

a. Technical Support Center (TSC).

1) The necessary equipment for the operation of the Atmospheric Dispersion Model in the TSC is given in Section VII. The T.I. 820 Printer, the two VA-3451P Modems (Marked A and B), the continuous Data Form paper, and the appropriate wiring harnesses are located in the TSC. Upon arrival in the TSC, make sure the separate pieces of equipment are properly connected to one another in accordance with the configuration shown in Attachment "A" of this procedure. Each cable is numbered to correspond with an identically numbered receptacle (i.e. #1 to #1, #2 to #2, etc.).

2) It is necessary that the T.I. 820 Printer and the VA-3451P Modems have the proper Terminal Configuration in order to successfully operate the Atmospheric Dispersion Model. This configuration shall be set for the faster 1200 Baud Rate. The configuration of the T.I. 820 Printer has been preset and should not require adjustment. If, however, the Printer is not properly configured, the instruction sheet for the necessary corrections is located on a pullout pad under the front lower left of the machine. For the 1200 Baud mode, the configuration number sequence should read 13, 25, 37. The method for obtaining this sequence of numbers is explained on the pullout pad mentioned above. The normal positions of the two rocker switches on the left side of the keyboard panel should be forward, in the LINE and VIEW position. The on-off switch is located on the back of the machine next to the 115 AC power cord should be in the ON position.

a) The switch configuration of the VA-3451P MODEMS should be as follows:

1. Front - Three toggle switches located on the left side of the machine are labeled FA; HS; and DA, VO, MA. The FA switch is a one position switch which will always be in the FA position. The HS switch has two positions and should be in the HS position for normal operation with the 1200 Baud Rate. The lower position, which is not labeled, is for use with the 300 Baud Rate, which will not be used under normal circumstances. The DA, VO, MA switch on the Modems should be in the middle or VO position.

2. Back - There are two horizontal switches on the back of each Modem. The inside switch (nearest the AC power cord) should be in the extreme outside position (away from the AC power cord). The outside switch (nearest the outer edge of the modem) is a three-position switch and should be in the middle position for normal use. The proper configuration and explanation of these two switches is attached to the bottom of each modem.

b) The lighting configuration on the front panel of the VA-3451P Modem is indicative of which mode the VA-3451P Modem happens to be in at the time the light is on. The key to the lighted panel is as follows:

1. TXD = Transmission of Data from the Printer to the Computer; only lights up when a signal is sent to the computer.

2. RXD = Lit when Recciving the Data from the Computer to the Printer.

3. HS = High Speed print rate; 1200 Baud when on/ 300 Baud when off.

4. CTS = Clear To Send; meaning the Modem is ready to work.

5. DSR = Data Set Ready; meaning the Computer is ready to work.

6. DTR = Data Terminal Ready; meaning the Printer is ready to work.

7. RI = Ring Mode; the Modem is ready to make a telephone call when the light is blinking.

8. CXR = Carrier Transmit; signal from the Computer to the Printer is established when lit. This mode will take 2 to 5 seconds after the first high-pitched tone is received. When the CXR light comes on the receiver may be hung up.

b. Emergency Operations Facility (EOF).

1) The necessary equipment for operation of the Atmospheric Dispersion Model in the EOF is given in Section VII. This equipment is stored in the CNS Security Building Administration Office. Each piece of equipment must be moved to the designated Radiological Assessment area. The equipment must then be properly connected in accordance with the configuration shown in Attachment "A" of this procedure. Each cable is numbered to correspond with an identically numbered receptacle (i.e. #8 to #8, #9 to #9, etc.).

2) The terminal configuration for the T.I. 820 Printer and the VA-3451P MODEMS is the same as those located in the TSC. That configuration is noted above.

2. Operating the Emergency Preparedness Atmospheric Dispersion Model - Interim Version.

a. Upon completion of the physical set up of the T.I. 820 Printer and appropriate MODEMS in the TSC and EOF as shown in Attachment "A", the following steps must be completed.

1) Plug all modules into a common 115 V AC outlet and turn the (OFF/ON) switch to the ON position on the T.I. 820 Printers. The VA-3451P MODEMS will automatically activate when the T.I. 820 is turned on.

2) In the TSC one telephone will be used to access the PRIME Computer in the Columbus General Office. The primary method of communication with the PRIME is the NPPD Microwave Telephone System. The secondary method of communication is a standard commercial telephone line. The numbers to be dialed in order to access the PRIME are as follows:

a) Primary Method (Microwave) from CNS is

b) Secondary Method (Commercial Telephone Line) from CNS is

Allow the telephone to ring until a continuous high pitched tone is received. The continuous high pitched tone indicates that access to the computer has been accomplished. At this time, push the three-position toggle switch on the VA-3451P MODEM A from the normal VO position to the DA position. Wait for the CXR indicator light on the front of the Modem to come on (light up). When the CXR light comes on, the communication link from the Computer to the Printer has been established and the telephone receiver should then be gently hung up.

In a normal operating condition the following lights on the VA-3451P MODEM will be on; HS, CTS, DSR, DTR, and CXR. If one or more of these lights are off, repeat Steps 1) and 2).

The second telephone in the TSC will be used to dial-up the Printer in the EOF. The dial-up number for the EOF is CNS Extension 301. Extension 301 is a direct hook-up to the VA-3451P MODEM located in the EOF. This is an Auto Answer/ Originate Modem which is connected directly to the T.I. 820 Printer in the EOF as shown in Attachment "A". Using a second telephone and VA-3451P MODEM B, the operator in the TSC will dial CNS Extension 301 and listen for the high-pitched tone as mentioned in the previous paragraph. Upon receiving the high-pitched tone, push the three-position toggle switch from the VO position to the DA position and wait for the CXR light to come on. Again the activation of this light indicates communication between the Printer in the TSC has been established with the Printer in the EOF.

At this time the equipment in the TSC is operational and the equipment in the EOF is slaved to the TSC equipment.

If the equipment in the TSC malfunctions, the VA-3451P Modem in the EOF will allow a direct communication link with the PRIME by pushing the switch on the Modem to the VO position and dialing the appropriate microwave number mentioned above. When the Computer has been accessed push the switch to the DA position as noted above.

During normal working hours contact the Columbus General Office Computer Services Division to clear all other work on the PRIME Computer. Since this program is run on a time share basis, clearing all other work will speed the calculations and enable the program to increase its efficiency. Contact one of the following people.

a) Dennis Smith -

b) Gary Linder -

c) John Riggle

d) Joe Srb -

3) At this time the Hard-Copy Terminals are operational. In order to test the terminals, the operator in the TSC shall type the word HELLO and then depress the return key. If the words LOGIN PLEASE ER! appear on the Hard-Copy Terminal, the equipment is functioning properly. If nothing is happening on the Printer, repeat Steps 1) through 3).

4) Upon proper completion of Steps 1) through 3) the following inputs must be entered in order to access the program Model. The computer prompt will indicate the order that inputs must be entered. The Computer Prompts and Operator Inputs are as follows:

Computer Prompt	Operator Input
LOGIN PLEASE ER!	LOGIN EPM1
PROJECT CODE ( ):	CNS
OK,	R EPM3

Notice that the operators' inputs sometimes require spaces between command words. For example; a space must be input between LOGIN and EPM1. Where shown all blanks are mandatory.

The program will now begin execution.

Give the program a Title (e.g. Turbine Steamleak).

5) The program will prompt each input that is necessary to properly execute the Model. Attachment "B" of this procedure contains certain site specific data asked for by the program. This data will be necessary for operator input to successfully complete the Model. With the exception of the Flow Velocity Data, all site parameters will be used as primary information for input to the program. Actual Flow Velocity Data may be obtained from the appropriate meters and charts in the Control Room and the information concerning the Flow Data Velocity in Attachment "B" will be used as secondary or backup data. This data is based on design flows and may NOT show the actual Flow Velocity. There is a halt after each prompt to allow the operator to input the necessary data. If the plume passes over special receptor or preselected sample points, the operator will be alerted. The operator should refer to Attachment "C" which identifies the map(s) referencing the corresponding locations.

NOTE: If at any time during the program the telephone link should become disconnected and the program ceases operation, take the following action. Re-dial the PRIME Computer and the Program will pick up where it left off when it was disconnected.

NOTE: In the event the terminals located in the TSC should malfunction or the TSC should be evacuated the TSC operator should NOT Log Out of the program. When the program reaches an appropriate stopping point such as the end of a 15 minute segment the operator will disconnect (hang up) the terminal from the PRIME Computer. This can be done by pushing the three-position toggle switches on both MODEM A and MODEM B to the VO position. At this time the EOF should be notified of the termination of TSC operation of the Dispersion Model. The operator in the EOF can then dial up the PRIME Computer as stated in Step 2) above and continue the uninterrupted sequence of 15-minute segments. The EOF then becomes the primary control center for operation of the Atmospheric Dispersion Model.

If the operator wishes to terminate the program, a prompt of 999 will occasionally appear. At this time, the operator must type 999. After typing 999, and thereby terminating the program, the following computer prompts will appear and the appropriate operator inputs must be entered.

Computer Prompt	Operator Input
STOP	
OK,	LO

6) The program has been Logged Out. The operator may either discontinue operations or initiate a new run. If a new run is desired, repeat Step 4) above. If the operator wishes to discontinue the operation of the program, push the three-position toggle switch from the DA position to the VO position.

B. Hand Calculated Dose Assessment.

1. The Emergency Director is responsible for the implementation of this procedure.

2. Initiate EPIP 5.7.16, Release Rate Determination, and obtain the release rate in (Ci/Sec) for:

   a. Noble Gases; record on Attachment "F", Section A., Column 3.

   b. Total Iodines; record on Attachment "F", Section B., Column 3.

   c. Recalculate Release Rates as a function of <u>effective age</u> and enter in the appropriate columns.

3. Determine the atmospheric stability category.

   a. Using differential temperature recorder determine atmospheric stability category. Visual aid on face of recorder will determine stability. Following step explains stability classification.

      1) Obtain the temperature difference in C° between 97m and 10m, if not available obtain the C° between 47m and 10m, if not available obtain the temperature difference between 97m and 47m (read from the upper level to the lower level). Utilizing the appropriate value, stability categories are defined as follows:

Pasquill Category	Delta Temp. °C (97m-10m)	Delta Temp. °C (47m-10m)	Delta Temp. °C (97m-47m)
A	-1.6	-0.70	-0.95
B	-1.6 to -1.5	-0.70 to -0.63	-0.95 to -0.85
C	-1.5 to -1.3	-0.63 to -0.55	-0.85 to -0.75
D	-1.3 to -0.43	-0.55 to -0.18	-0.75 to -0.25
E	-0.43 to 1.3	-0.18 to 0.55	-0.25 to 0.75
F	1.3 to 3.5	0.55 to 1.48	0.75 to 2.0
G	3.5	1.48	2.0

   b. Stability Category determines utilizing meteorological data is also discussed in Attachment "D".

4. Overlays.

a. If 2, 5, and 20 mile plume centerline doses are to be determined, calculate the plume centerline X/Q using Attachment "L", 2, 5, And 10 Mile Plume Centerline Determination. Complete these calculations and proceed to Step 6. of this procedure.

b. If it is necessary to identify key receptor sites and compute doses for these sites, select the proper atmospheric dispersion overlay. Overlays are labeled according to the atmospheric stability class. If the release is not from the ERP, utilize dispersion overlay stability Category C.

c. Situate the overlay upon the base map. Utilizing the wind direction in compass headings at the 97m height as previously determined, rotate the overlay until the plume centerline is oriented in the direction of the compass heading (compass headings are provided for a full 360° azimuth about the site).

d. Once the dispersion overlay is placed upon the base map, it is clear which receptor locations may be in the path of the dispersing plume. List <u>key</u> receptor site locations in Attachment "E", Column 2.

5. Determine X/Q values for key receptor sites.

a. Values on the overlay are $\frac{X\ 10m/s}{Q}$.

b. Each receptor site will have a different X10u/Q value.

1) X10u/Q values on the overlay are shown as isopleth lines printed directly upon the overlay. Each isopleth line is labeled with a capital letter to indicate its relative strength. The numerical value corresponding to the letter is shown in the far, lower right corner of the overlay. Plume centerline values are marked by plus marks (+) directly along the centerline. Each plus mark corresponds to the downwind distance labeling the vertical edges of the figure. The X10u/Q associated with each centerline distance is indicated in the lower right corner of the overlay, directly to the left of the X10u/Q value associated with the isopleth lines (capital letter values). Utilizing these values, it is possible to interpolate X10u/Q values for any area bounded by the outermost isopleth of each overlay. Record the X10u/Q value for each receptor site in Attachment "E", Column 3.

2) Estimate the X10u/Q value for each of the receptor site locations. It may be necessary to interpolate between isopleths. Enter this value in Attachment "E", Column 3.

3) Obtain the windspeed in m/s at the 97m height. Enter this value in Attachment "E", Column 4.

Note: $\frac{MPH}{2}$ = Meters/Sec (M/S).

4) Divide Column 3 by Column 4 yielding the resultant X/Q (Sec/m^3) value for that receptor site and record in Column 5.

In equation form the calculation may be represented as:

$$X/Q\ (Sec/m^3) = \frac{X\ 10m/s/Q}{\text{Windspeed (m/s) At 97m}}$$

Note: Dose Calculations will be performed on Attachment "F". A separate Attachment "F" should be used for each key receptor site (refer to Attachment "J" for dose equations and parameter descriptions).

6. Calculate the whole body gamma dose rates and dose commitment from noble gases for each key receptor site using (Attachment "F", Section A.).

a. Obtain the receptor site X/Q value determined in Step 4. or 5. (above) and enter in Sections A. and B., Column 2.

b. Determine the gamma decay Energy E as a function of effective age of the noble gas at the receptor site utilizing Attachment "G". Average gamma decay energy for noble gases as a function of effective age. Enter this value in Section A., Column 4.

1) For most cases the effective age of the noble gas at the receptor site may be equal to the effective age at the time of the release onset.

2) If the transit time from the release point to the receptor site is greater than 1 hour the transit time component should be considered. This will result in a more realistic dose estimate. Refer to Attachment "H" for effective age determinations at receptor site involving consideration of transit times.

c. Enter the anticipated or actual time of exposure in Column 7.

d. Complete math computations in Section A.

7. Calculate the thyroid inhalation dose rates and integrated doses from total iodines using Attachment "F", Section B.

a. Obtain the total iodine dose rate commitment factor as a function of effective age using Attachment "I", Total Iodine Dose Commitment Factors. Enter this value in Section B., Column 4.

Note: Attachment "I" is a log-log scale with units of 1.0 E+8 through 1.0 E+9 or the y-axis.

For effective ages greater than 100 hours use a value of 1.86 E+09 mrem-m^3/Hr-Ci.

b. Enter the acticipated or actual time of exposure in Column 6.

c. Complete the math computations in Section B.

8. Update and refine the dose assessments for critical receptor sites upon significant changes in releases, meteorological conditions, or effective ages (whole body gamma MeV/dis and thyroid total iodine conversion factors).

a. Sum the previous exposures using Attachment "F", Sections A. and B.

C. Initial Dose Assessment For On-Shift Personnel.

1. This method of dose assessment may be used by on-shift personnel to establish an initial dose assessment of off-site releases. This method may serve as an initial assessment until the on-shift crew is augmented by emergency response personnel and further dose assessment evaluations can be accomplished.

2. EPIP 5.7.16, Release Rate Determination, must have been completed. Identify the release point and refer to the appropriate Attachment in EPIP 5.7.16.

a. Attachment "A", Elevated Release Point Using Effluent Monitor Release Rate Determination.

b. Attachment "B", Turbine Building Release Rate Determination.

c. Attachment "C", Augmented Radioactive Waste Release Rate Determination.

d. Attachment "D", Elevated Release Point Primary Containment Monitor Release Rate Determination.

Record the noble gas and total iodine released from EPIP 5.7.16, Release Rate Determination, onto Attachment "J", On-Shift Initial Dose Assessment, of this procedure.

3. Sum the noble gas and total iodines being released and record on Attachment "J".

4. Because the data presented in the tables of Attachment "J" are per 100 Ci/Sec release, divide the total release above by 100 to determine the multiplication factor and record on Attachment "J", On-Shift Initial Dose Assessment.

5. Determine atmospheric stability class (see Page 9, Step B.3. of this procedure). Using differential temperature recorder determine atmospheric stability category. Visual aid on face of the recorder will determine stability. Record on Attachment "J", On-Shift Initial Dose Assessment, Item 2.

6. Determine wind speed from the wind speed record for the top of the ERP and record the mph on Attachment "J", On-Shift Initial Dose Assessment, Item 2.

7. Using the atmospheric stability class as a guide, choose one of the three tables that most closely compares with that stability class.

8. Using the wind speed an exposure rate at any distance up to 50 miles may be approximated.

9. Normally the exposure rates to the nearest downwind residence, population center, or area will be determined.

   Note: The thyroid exposure is based on adult uptake to determine the child thyroid dose rate; double the adult dose rate.

   Record the exposure rates at the chosen receptor site on Attachment "J".

10. Multiply the exposure rates times the multiplication factor from Step 4. to correct the exposure rates to the actual release and record on Attachment "J".

11. By integrating the exposure rate over a period of time (anticipated or actual duration of the release) the total dose can be determined. Record the rate and time on Attachment "J" and determine the total dose.

12. Compare the total integrated dose to Protective Action Guides in EPIP 5.7.20, Protective Action Guides.

    Note: EPIP 5.7.20, Protective Action Guides, Attachment "E", contains a similar set of tables that estimates the number of hours before a protective action guide is exceeded for this same release.

13. Inform the Emergency Director of the exposure rate, integrated dose, and protective guide comparison. It is the Emergency Director's decision to recommend a protective action.

D. Correlating Dose Assessment Determination With Off-Site Sampling Data.

1. Dose assessment determinations are based upon projected airborne radionuclide concentrations. By correlating projected airborne radionuclide concentrations with actual airborne radionuclide concentrations a dose assessment correction factor may be derived. This correction factor will be derived using actual and projected I-131 airborne concentrations.

a. Actual noble gas, particulate, and iodine off-site air concentrations will be determined by collecting off-site air samples (refer to EPIP 5.7.18) and analyzing these samples in the Radiochemistry Laboratory (refer to Chemistry Procedure 8.4.1.2 for sample analysis details). Generally, the most accurate results are obtained for I-131.

2. Record the projected I-131 release rate at the time of off-site sample collection from EPIP 5.7.16, Release Rate Determination, Attachment "I", onto Attachment "K", Dose Assessment Correction Factor Determination, Column 3, of this procedure.

3. Record the X/Q value for the sample collection location at the time of collection from Section A., Computer Dose Calculation, or Section B., Hand Calculation, Attachment "F", of this procedure on Attachment "K", Column 4.

4. Multiply the projected I-131 release rate (Ci/Sec), Column 3, by the X/Q value (Sec/m^3), Column 4, to obtain the projected I-131 airborne concentration (Ci/m^3 or µCi/cc), Column 5. Enter this value in Column 7.

5. Obtain the actual I-131 air concentration (Ci/m^3 or µCi/cc) from the Radiochemistry Laboratory and record this value on Attachment "K", Column 6.

6. Divide the actual I-131 air concentration (Ci/m^3 or µCi/cc) by the projected I-131 air concentration (Ci/m^3 or µCi/cc) to obtain the dose assessment correction factor, Column 8.

7. The Radiological Manager/Coordinator shall determine if the correction factor is applicable to all receptor sites or limited to specific receptor sites.

   a. For designated sites multiply the previously determined dose calculation by the correction factor.

   b. For designated sites incorporate the correction factor into future dose calculations.

IX. ATTACHMENTS

A. Attachment "A", Terminal Hook-Up Configuration At CNS Technical Support Center, Emergency Operations Facility, And Columbus General Office Flow Diagram.

B. Attachment "B", EPM2 Atmospheric Dispersion Model - Interim Version Input Information.

C. Attachment "C", Maps List.

D. Attachment "D", Stability Category Determination (Utilizing Data Obtained From Meteorological Tower).

E. Attachment "E", Key Receptor Site And X/Q Determination.

F. Attachment "F", Dose Rates And Integrated Dose For Whole Body And Thyroid Calculation.

G. Attachment "G", Noble Gas Mixture Average Gamma Decay Energy.

H. Attachment "H", Transit Times And Effective Ages Of Noble Gases At Receptor Sites Of Interest Determination.

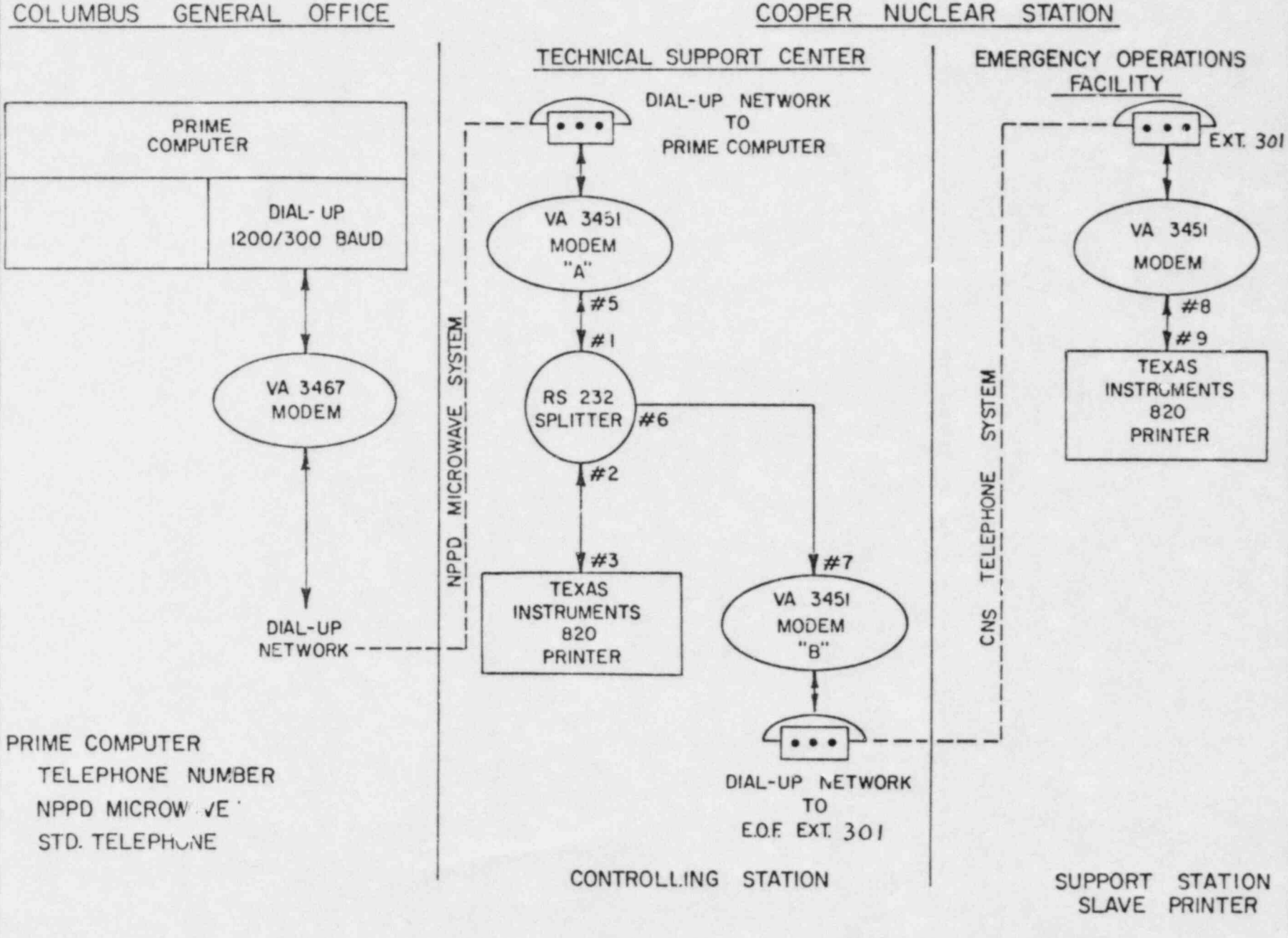
I. Attachment "I", Total Iodine Dose Commitment Factors Vs. Effective Age.

J. Attachment "J", On-Shift Initial Dose Assessment.

K. Attachment "K", Dose Assessment Correction Factor Determination.

L. Attachment "L", 2, 5, And 10 Mile Plume Centerline X/Q Determination.

ATTACHMENT "A" EPIP 5.7.17 TERMINAL HOOKUP CONFIGURATION



EPM2 ATMOSPHERIC DISPERSION MODEL - INTERIM VERSION INPUT INFORMATION

PARAMETER	REACTOR BUILDING	T-G BUILDING FAN EXHAUST BUILDING	RADWASTE BUILDING		AUGMENTED RADWASTE BUILDING	ELEVATED RELEASE POINT
Number Of Ducts	1	1	DUAL	SINGLE	1	1
Duct Coordinates (From ERP)	75'W, 492'N	100'E, 396'N	267'W, 583'N	230'W, 583'N	342'W, 525'N	0, 0
Model Coordinate Input	-75, 492	100, 396	-267, 583	-230, 583	-342, 525	0, 0
Effluent Release Height (Meters Above Grade)	49.1	10.1	16.5	16.5	13.5	99.4
Height Of Tallest Adjacent Building (Meters Above Grade)	44.5	44.5	44.5	44.5	44.5	44.5
Flow Velocity(e) (Meters/Second)	11.66	8.05(a)	6.45	8.16	15.67	14.42(b) 8.56(c) 22.98(d)
Flow Rate (cfm)	73405	50710(a)	40570	10030	16500	3000(b) 1780(c) 4780(d)
Release Vent (Meters)	1.95	1.95(a)	1.95	0.86	0.80	0.35
Diameter (Feet)	6.38	6.38(a)	6.38	2.82	2.61	1.16
Exhaust Temp (°F) Winter	70	70	70	70	70	60
Exhaust Temp (°F) Summer	90	90	90	90	90	90
Structure Elevation (Feet MSL)	Rx Bldg 1049' Ex Fan 1064'	TGB 1010' Fan Bldg 933'	Bldg 952' Ex Fan 957'	Bldg 952' Ex Fan 957'	Bldg 941' Ex Fan 941'	1228'
Grade Level (Feet MSL)	903'	903'	903'	903'	903'	903'

(a) Data given for Turbine-Generator exhaust fans is for one operating fan. Multiply data by total number of fans in operation. There are a total of four (4) fans. Typically three fans are in continuous operation with one standby.

(b) Elevated Release Point Dilution Fan Only.

(c) Standby Gas Treatment Fans Only.

(d) Elevated Release Point Dilution Fan and Standby Gas Treatment System Fans. This is the normal operating situation when the Standby Gas Treatment System is in operation.

(e) Design basis only - These numbers are to be used as backup information only. When possible use actual meter or chart readings.

MAPS LIST

1. Atmospheric Dispersion Model (EPM2) Special Receptor Points, NPPD Drawing CNS-MI-102, 10 Mile Radius.

2. Preselected Radiological Sampling And Monitoring Points In The Vicinity Of Cooper Nuclear Station, NPPD Drawing CNS-MI-03, 10 Mile Radius.

3. Cooper Nuclear Station Site And Property Boundary, NPPD Drawing 2.2 (P3-A-45), Revision 1, 1 Mile Radius.

4. Cooper Nuclear Station 50 Mile Emergency Planning Zone, Revision 2, 50 Mile Radius.

STABILITY CATEGORY DETERMINATION

(UTILIZING DATA OBTAINED FROM METEOROLOGICAL TOWER)

Methods Area Listed In Order Of Preference

1. Obtain the temperature difference in C° between 100m and 10m, if not available obtain the Delta C° between 100m and 60m, if not available obtain the delta C° between 60m and 10m. Utilizing the appropriate value, stability categories are defined as follows:

Pasquill Category	Delta Temp °C (100m-10m) *1	Delta Temp °C (100m-60m) *2	Delta Temp °C (60m-10m)
A	-1.7	-0.76	-0.95
B	-1.7 to -1.5	-0.76 to -0.68	-0.95 to -0.85
C	-1.5 to -1.3	-0.68 to -0.60	-0.85 to -0.75
D	-1.3 to -0.45	-0.60 to -0.20	-0.75 to -0.25
E	-0.45 to 1.3	-0.20 to 0.52	-0.25 to 0.75
F	1.3 to 3.6	0.52 to 1.6	0.75 to 2.0
G	3.6	1.6	2.0

STABILITY CATEGORY DETERMINATION

2. Obtain sigma at 100 meters for windspeeds above the threshold value. If not available obtain sigma at 10 meters. Utilizing the appropriate value, stability categories are defined as follows:

Stability Category	Stnd Deviation At 100m	Stnd Deviation At 60m	Stnd Deviation At 10m
A			25
B			20
C			15
D			10
E			5
F			2.5
G			1.7

3. If none of the above data is available from the new meterological tower, utilize data from the ERP tower.

4. If data is not available from either meterological tower utilize data obtained through visual observation.

STABILITY CATEGORY DETERMINATION

KEY TO STABILITY CATEGORIES

Surface Wind: _____ Day: _____ Night: _____

Speed (At 33') (m/Sec)	Incoming Solar Radiation			Thinly Overcast	
	Strong	Moderate	Slight	Greater Than 1/2 Cloud	Less Than 3/8 Cloud
2	A	A-B	B		
2-3	A-B	B	C	E	F
3-5	B	B-C	C	D	E
5-6	C	C-D	D	D	D
6	C	D	D	D	D

Note: The neutral class, D, should be assumed for overcast conditions during day or night.

- Sampling time of 10 minutes.
- Night refers to the period from 1 hour before sunset to 1 hour after sunrise.
- Class D may be assumed for overcast condition during day or night, regardless of wind speed.
- Strong incoming solar radiation; solar altitude greater than 60° with clear skies.
- Slight incoming solar radiation; solar altitude from 15° to 35° with clear skies.

KEY RECEPTOR SITE AND X/Q DETERMINATION

Effective Age (Hr)	Receptor Site	X10u/Q (m/s)		Windspeed At 97m (m/s)		X/Q_3 (Sec/m^3)
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	
			x	(10/ m/s)	=	

Note: $\frac{\text{MPH}}{2}$ = Meters/Sec.

DOSE RATES AND INTEGRATED DOSE FOR WHOLE BODY AND THYROID CALCULATION

Receptor Site Location: _____ Name: _____

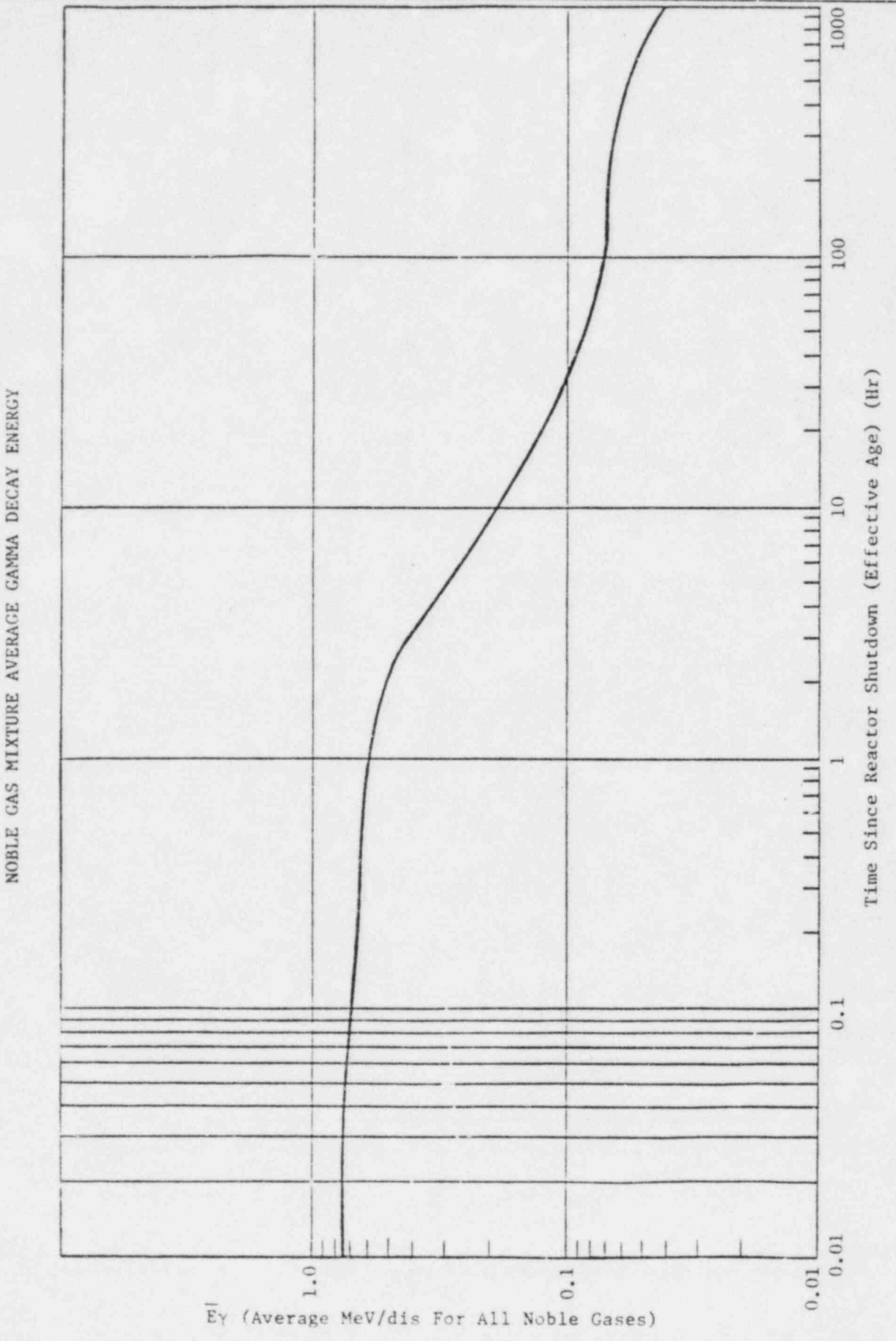
Section A.
Whole Body Dose Rate And Integrated Doses From Noble Gases As A Function Of Effective Age

Effective Age (Hr) (1)	X/Q_3 (Sec/m^3) (2)	Release Rate* $RR_{\gamma i}$ (Ci/Sec) (3)	E* (MeV/dis) (4)	Conv Fac $\frac{mR\text{-}dis\text{-}m^3}{MeV\text{-}Di\text{-}Hr}$ (5)	Dose Rate Dng (mrem/Hr) (6)	Exposure Time (Hr) (7)	Dose* (mrem) (8)
		x	x	x 9.5E5	=	x	=
		x	x	x 9.5E5	=	x	=
		x	x	x 9.5E5	=	x	=
		x	x	x 9.5E5	=	x	=
		x	x	x 9.5E5	=	x	=
		x	x	x 9.5E5	=	x	=
		x	x	x 9.5E5	=	x	=
		x	x	x 9.5E5	=	x	=
						Sum=	

Section B.
Thyroid Inhalation Dose Rates And Integrated Doses

Effective Age (Hr) (1)	Q/X_3 (Sec/m^3) (2)	Total Iodine* Release Rate RR (TI) (Ci/Sec) (3)	TI Conv Factor* $\frac{mrem\text{-}m^3}{Hr\text{-}C_1}$ (4)	Adult Dose Rate TI (mrem/Hr) (5)	Exposure Time (Hr) (6)	Adult Dose Commit (mrem) (7)	Child Dose Commit (mrem) (8)
		x	x =	x	=	x2=	
		x	x =	x	=	x2=	
		x	x =	x	=	x2=	
		x	x =	x	=	x2=	
		x	x =	x	=	x2=	
		x	x =	x	=	x2=	
		x	x =	x	=	x2=	
		x	x =	x	=	x2=	
					Sum=	Sum=	

*Update dose assessments upon significant changes in releases, meteorological conditions (X/Q) or effective ages (whole body MeV/dis or thyroid total iodine conversion factors).


NOBLE GAS MIXTURE AVERAGE GAMMA DECAY ENERGY
Time Since Reactor Shutdown (Effective Age) (Hr)
1000
100
10
1
0.1
0.01
1.0
0.1
0.01
$\bar{E}_\gamma$ (Average MeV/dis For All Noble Gases)

TRANSIT TIMES AND EFFECTIVE AGES OF NOBLE GASES AT RECEPTOR SITES OF INTEREST DETERMINATION

A. Effective Age is defined as time elapsed (Hr) since the core power generation was halted. For off-site locations the effective age of the isotopic mixture may be obtained through summarizing the following components:

1. The effective age at the time of release onset.

2. The transit time from the release point to the receptor site (refer to Section B. below).

B. Calculation of Transit Time from the release point to the receptor location.

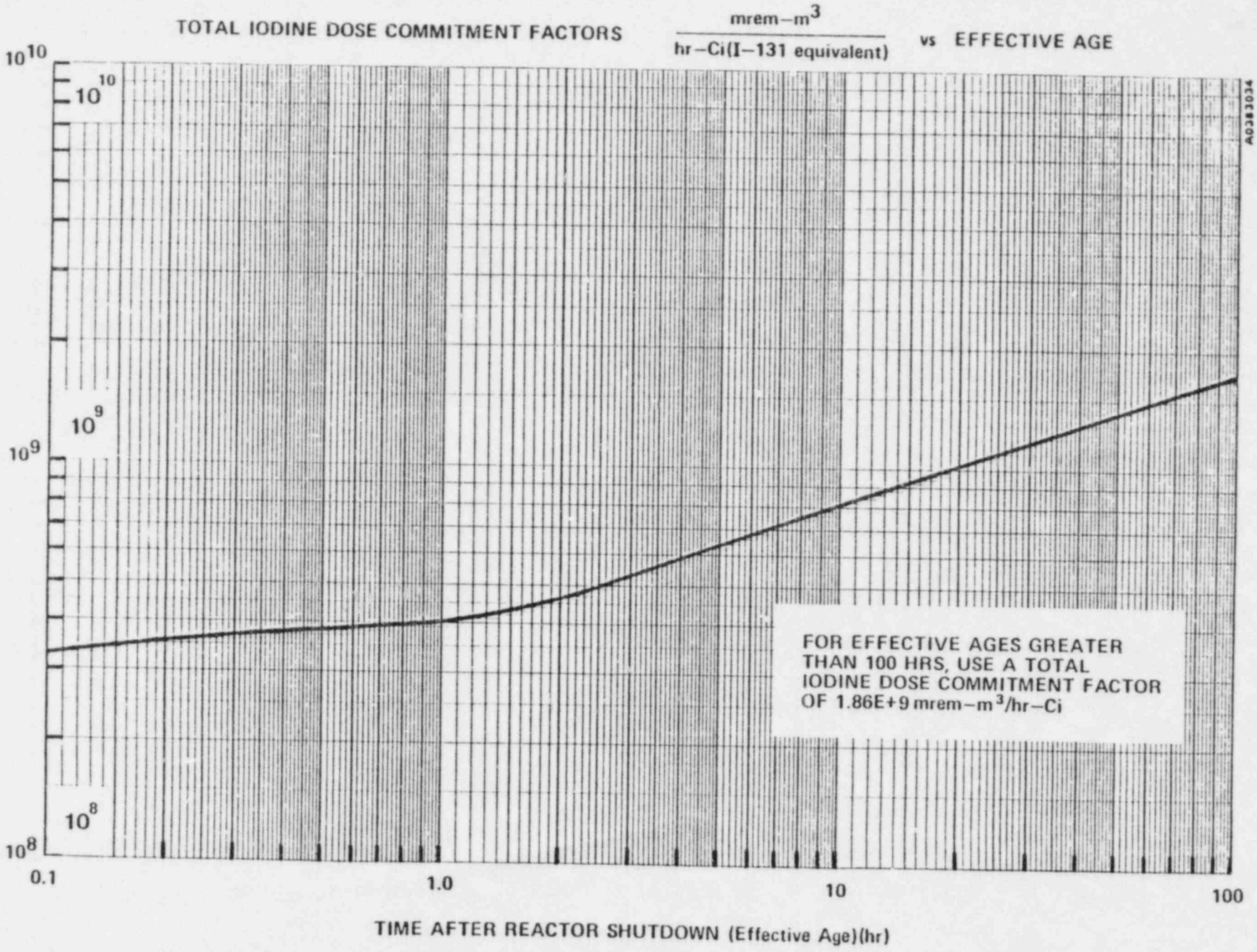
1. Estimate the downwind distance (miles) to the receptor location.

2. Divide the distance in miles by the 97m meter level wind speed (mph) to determine the plume transit time.

Receptor Site Downwind Distance (Miles)		97m Level Wind Speed (mph)		Plume Transit Time (Hr)
_____	÷	_____	=	_____
_____	÷	_____	=	_____
_____	÷	_____	=	_____
_____	÷	_____	=	_____
_____	÷	_____	=	_____

C. Determination of Effective Ages at receptor sites.

Effective Age Of Mixture At Time Of Release Onset (Hr)		Transit Time From Release Point To Receptor Location (Hr)		Effective Age Of Isotopic Mixture At Receptor Location (Hr)
_____	+	_____	=	_____
_____	+	_____	=	_____
_____	+	_____	=	_____
_____	+	_____	=	_____
_____	+	_____	=	_____


TOTAL IODINE DOSE COMMITMENT FACTORS mrem−m³ / hr−Ci(I−131 equivalent) vs EFFECTIVE AGE
10¹⁰
10⁹
10⁸
0.1
1.0
10
100
TIME AFTER REACTOR SHUTDOWN (Effective Age)(hr)
FOR EFFECTIVE AGES GREATER THAN 100 HRS, USE A TOTAL IODINE DOSE COMMITMENT FACTOR OF 1.86E+9 mrem−m³/hr−Ci

ON-SHIFT INITIAL DOSE ASSESSMENT

1. Release Rates (From EPIP 5.7.16, Release Rate Determination):

   Release Rate Noble Gases: _____ Ci/Sec

   Release Rate Total Iodines: _____ Ci/Sec

   Total Release (Sum Of Noble Gases And Total Iodines): _____ Ci/Sec

   $\frac{\text{Ci/Sec}}{100\ \text{Ci/Sec}}$ = Multiplication Factor

2. Meteorological Data:

   Stability Factor: _____

   Wind Speed MPH: _____

3. Using the above stability factor choose one of the three following tables that most closely represents that stability factor.

Exposure Rate mRem/Hr From 100 Ci/Sec Release Rate

STABILITY CLASS A OR B

WIND VELOCITY MPH	EXPOSURE MODE	DISTANCE DOWN WIND OF CNS MILES							
		1.5	2.5	3.5	5	10	20	35	50
22.5	Thyroid	53	22	16	12	7	4	2	---
	External	5	2	2	1	---	---	---	---
10	Thyroid	122	49	38	27	15	3	---	---
	External	12	5	4	2.5	1	---	---	---
5	Thyroid	250	100	75	55	20	7	---	---
	External	22	9	7	5	2	---	---	---

ON-SHIFT INITIAL DOSE ASSESSMENT

STABILITY CLASS C OR D

WIND VELOCITY MPH	EXPOSURE MODE	DISTANCE DOWN WIND OF CNS MILES							
		1.5	2.5	3.5	5	10	20	35	50
22.5	Thyroid	278	227	160	120	50	21	10	---
	External	27	22	16	11	5	2	1	---
10	Thyroid	625	556	385	263	111	12	---	---
	External	63	50	37	23	9	1	---	---
5	Thyroid	1250	1000	833	556	227	32	---	---
	External	125	91	67	43	15	2	---	---

STABILITY CLASS E OR F

WIND VELOCITY MPH	EXPOSURE MODE	DISTANCE DOWN WIND OF CNS MILES							
		1.5	2.5	3.5	5	10	20	35	50
22.5	Thyroid	---	20	47	79	94	70	47	---
	External	---	2	5	8	9	6	4	---
10	Thyroid	---	46	110	185	217	28	---	---
	External	---	4	10	16	17	2	---	---
5	Thyroid	6	93	227	357	417	69	---	---
	External	---	8	19	29	29	3	---	---

4. Using wind speed and distance, determine exposure rates: Distance: _____ Miles

	Exposure Rate	x Multiplication Factor (From Step 1.)	=	Exposure Rate (mrem/Hr)
External:	_____	x _____	=	_____
Thyroid:	_____	x _____	=	_____

5. Integrate the exposure rate from the above, over the anticipated or actual time of the release to determine integrated dose:

Exposure Rate	x	Time	=	Integrated Dose
_____ mRem/Hr Thyroid	x	_____ Hours	=	_____ mRem Thyroid
_____ mRem/Hr External	x	_____ Hours	=	_____ mRem External

Note: Derived thyroid dose from above is for an adult. Child thyroid dose is double that of the adult.

DOSE ASSESSMENT CORRECTION FACTOR DETERMINATION

Sample Site Location (1)	Effective Age At Sampling Time (2)	Projected I-131 Release Rate (Ci/Sec) (3)		Sample Site X/Q Value (Sec/m^3) (4)		Projected I-131 Airborne Conc (Ci/m^3) (5)	Actual I-131 Airborne Conc (Ci/m^3) (6)		Projected Airborne Conc (Ci/m^3) (7)		Dose Assessment Correction Factor (8)
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	
			x		=			÷		=	

2, 5, AND 10 MILE PLUME CENTERLINE X/Q DETERMINATION

1. Obtain the windspeed in m/s at the 97m height.

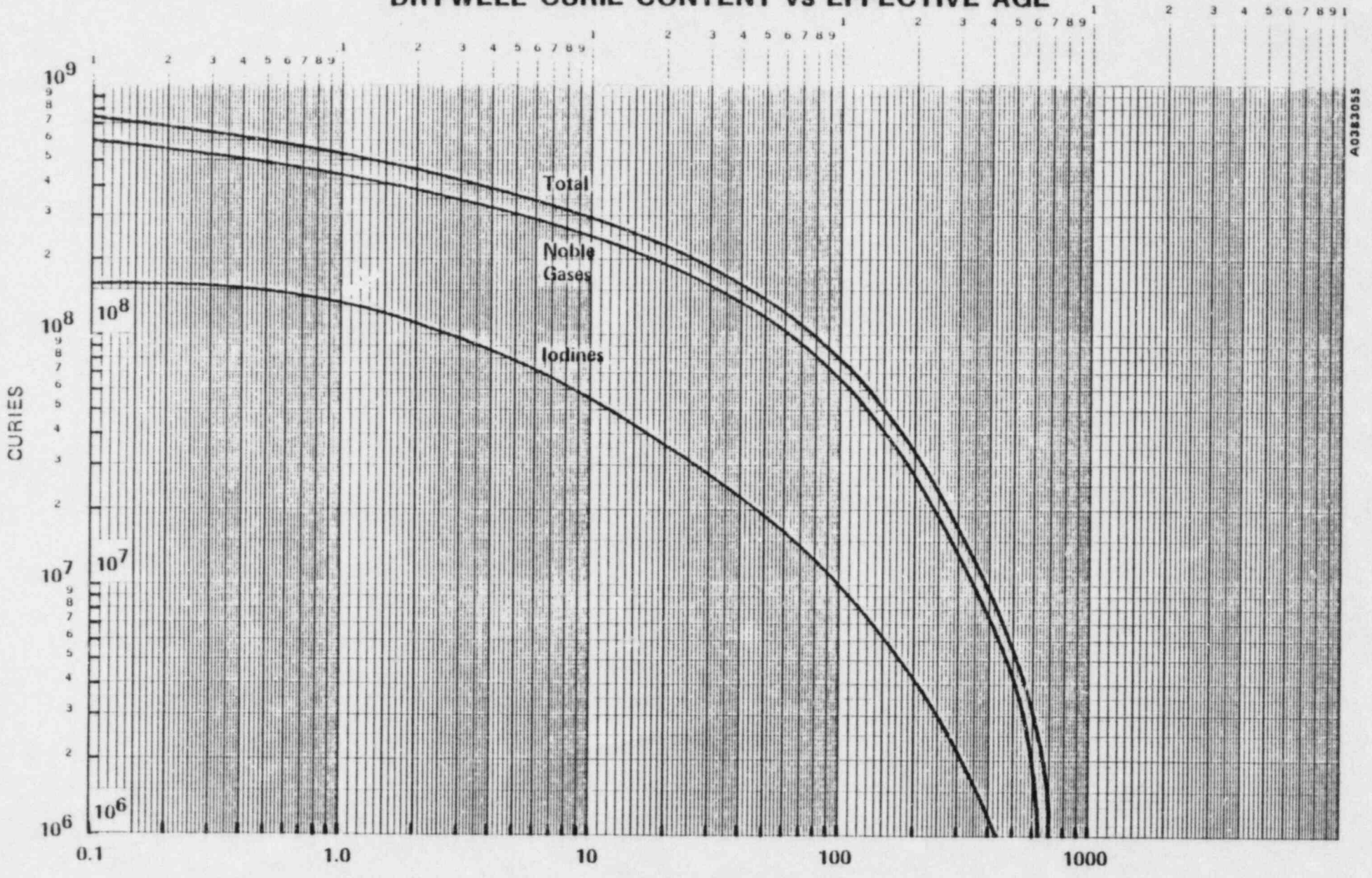
   Note: $\frac{MPH}{2} = (m/s)$

2. Sector the appropriate stability category below and enter the 97m height windspeed in the column.

3. Complete the math computations.

Stability Category	Plume Centerline Distance (Miles)	X 10u/Q	Windspeed At 97m (m/s)	X/Q (Sec/m^3)
A	2	6.38 E-09	x (10/____ m/s) =	
	5	2.93 E-09	x (10/____ m/s) =	
	10	1.61 E-09	x (10/____ m/s) =	
B	2	9.01 E-08	x (10/____ m/s) =	
	5	3.71 E-09	x (10/____ m/s) =	
	10	2.07 E-09	x (10/____ m/s) =	
C	2	6.04 E-07	x (10/____ m/s) =	
	5	1.37 E-07	x (10/____ m/s) =	
	10	4.52 E-08	x (10/____ m/s) =	
D	2	1.38 E-06	x (10/____ m/s) =	
	5	5.11 E-07	x (10/____ m/s) =	
	10	2.14 E-07	x (10/____ m/s) =	
E	2	3.01 E-06	x (10/____ m/s) =	
	5	1.18 E-06	x (10/____ m/s) =	
	10	5.69 E-07	x (10/____ m/s) =	
F	2	6.04 E-06	x (10/____ m/s) =	
	5	2.08 E-06	x (10/____ m/s) =	
	10	1.06 E-06	x (10/____ m/s) =	
G	2	1.36 E-05	x (10/____ m/s) =	
	5	4.44 E-06	x (10/____ m/s) =	
	10	2.04 E-06	x (10/____ m/s) =	

DRYWELL CURIE CONTENT vs EFFECTIVE AGE



I. PURPOSE

This procedure describes the emergency on-site radiological monitoring necessary to determine exposure rates, airborne particulate, noble gas, and radioiodine activity levels due to an accidental release of radionuclides. The on-site survey entails the interior space of all station buildings.

II. DISCUSSION

In the event of an accidental release involving radionuclides, data obtained from the on-site survey will be used to make initial assessments concerning the magnitude of the accident and decisions concerning evacuation of non-essential site personnel.

Principal concerns for accidental radioactive releases, particularly gaseous releases, include limiting internal doses through appropriate respiratory protection equipment, anti-contamination clothing, limiting external exposures by identifying areas of high external radiation, and containment of the material to prevent the spreading of contamination or release to the environs.

III. REFERENCE MATERIAL

A. CNS Emergency Plan.

B. NUREG 0654, Revision 1.

IV. PREREQUISITES

A. An unexpected in-plant release of radioactive material has occurred.

V. LIMITATIONS

A. Emergency radiation exposures in excess of 3 rem must be authorized by the Emergency Director in accordance with EPIP 5.7.12. Under no circumstances are exposures for sampling or monitoring procedures to exceed 5 rem (whole body), 15 rem (thyroid), or 75 rem (extremities).

VI. PRECAUTIONS

A. Use appropriate protective equipment.

B. Clearly label contaminated material and control access and egress from the area.

C. Check the batteries and perform source check test on the survey instruments to be used.

1. Allow warm up time for high range survey equipment.

2. While in route to the survey location, keep the survey meter on, with the meter set on the high scale and switch down as necessary.

VII. EQUIPMENT

A. As a minimum, the following equipment available from the emergency lockers is required:

1. High range survey instrument.

2. Appropriate self-reading dosimeter.

3. TLD.

4. Hand-held radios if deemed necessary.

5. Protective clothing and/or respirators.

a. Coveralls, hoods, shoe covers.

b. Respiratory equipment (self-contained or filter mask).

6. Air sampler (only if airborne sampling is required).

a. Plastic bags and envelopes for air samples.

VIII. PROCEDURE

A. On-Site Radiological Monitoring.

1. The on-site radiological monitoring team(s) are under the direction of the Chemistry and Health Physics Coordinator or his designee.

2. Survey members will be selected from those assembled at the Chemistry and Health Physics OSC and/or EOF.

a. Receive initial briefing and initial assignments from the Chemistry and Health Physics Coordinator or his designee.

b. Form the monitoring teams; each team should be comprised of two members.

c. Obtain appropriate equipment from the Emergency Lockers and perform the following tasks:

1) If necessary, don the protective clothing and respiratory equipment.

2) Record the pocket dosimeter readings.

3) Check the batteries and perform source check test on the survey instruments to be used.

a) Allow warm up time for high range survey equipment.

4) Obtain the background readings with the window open and window closed and record these readings.

5) If necessary, assemble appropriate air sampling equipment (sampler, cartridge, and filter) using the proper cartridge(s):

a) Identify the flow direction on the filter paper before installation.

b) If both radioiodines and noble gases are to be analyzed use CHARCOAL CARTRIDGES.

c) If only radioiodines are to be evaluated use AgXe, SILVER ZEOLITE cartridges.

Note: Noble gas concentrations may be determined by subtracting the silver zeolite results from the charcoal results.

d) Install the particulate filter and a radioiodine cartridge on the air sampler.

e) Turn on the air sampler, checking for proper flow rate (3 cfm).

3. On-site emergency monitoring procedures.

Note: Monitoring teams may be assigned one or more of the following tasks; gross gamma and/or beta dose rate measurements, air particulate levels, and radioiodine levels.

a. Gamma-beta dose rates.

1) While enroute to the survey location keep the survey meter on with the meter set on the high scale switch down as necessary.

2) Upon arrival at the survey location enter the area cautiously with the meter set in the high scale and the switch down as necessary:

a) Ascertain whether any of the following conditions exist: presence of steam or spillage, failed piping or equipment, or radiation levels in excess of 10 R/Hr. If conditions are judged to be serious, exit from the area and relay this information to the Chemistry and Health Physics Coordinator.

b) Perform the gamma dose rate measurements.

1. Use the survey instrument with the window closed.

3) Make a dose rate measurement with the detector held about 3' off the ground (waist level).

4) Record the data using normal station survey sheets.

5) Occasionally check the overhead or floor level radiation readings to make sure they are not significantly higher than the waist level measurements.

6) Repeat the procedure with the window open.

7) Record the data using normal station survey sheets.

8) From the above information determine the beta exposure rate and record.

b. Collection of the air particulate and radioiodine samples.

1) Assemble the air sampling equipment in accordance with Step 2.c. (this should be completed before arriving at the sampling location).

2) Start the air sampler.

a) Adjust the flow rate to the desired level, usually 3 cfm.

b) Allow the sampler to run at least 5 minutes.

c) Record the start time, stop time, flow rate, location, and sample on normal station air sampling survey sheets.

d) Place the particulate filter and the radioiodine cartridge on separate plastic bags, date, label, and seal in a plastic bag.

e) Return the particulate filter and iodine cartridge to the Health Physics Counting Room or Radiochemistry Counting Room for analysis.

f) To obtain the total iodine inhalation dose rate (mrem/Hr) multiply the I-131 air concentration (μCi/cc) by the appropriate correction factor:

Effective Age (Hr)	Correction Factor (mrem - cc/Hr - μCi I-131)
0 - 2	2.6 E+9

Effective Age (Hr)	Correction Factor (mrem - cc/Hr - μCi I-131)
2.1 - 10	2.4 E+9
10.1 - 30	2.1 E+9
30.1 - 100	2.0 E+9
> 100	1.86 E+9

c. Refer to Chemistry Procedure 8.4.1.2, Emergency Sampling - Gaseous Releases, for the collection of radioiodines, particulates, and noble gas samples at the release pathway and contact the Radiological Manager/Coordinator before implementing this procedure.

d. Post accident samples of primary coolant and containment atmosphere may be obtained to aid in release core degradation information. Refer to Chemistry Procedure 8.4.1.1, Post Accident And Atmosphere Sampling and contact the Radiological Manager/Coordinator before implementing this procedure.

IX. ATTACHMENTS

A. None.

I. PURPOSE

The purpose of this procedure is to provide a basis for relating actual or projected plume exposure doses to the EPA Protective Action Guides (PAGs) in order to recommend the appropriate protective actions to the County or State governments.

II. DISCUSSION

Dose estimates (which population groups may potentially receive) are calculated according to the dose assessment methodology described in EPIP 5.7.17, Dose Assessment. These dose estimates are referred to as projected doses. A protective action is an action taken to avoid or reduce a projected dose when the benefits derived from such action are sufficient to offset any undesirable features of the protective action.

III. REFERENCE MATERIAL

A. CNS Emergency Plan.

B. NUREG 0654, Revision 1.

C. Protective Action Guides And Protective Actions For Nuclear Incidents Manual, U.S. E.P.A., September 1975 (Revised May 1980).

D. Reactor Safety Study, Appendix VI, WASH 1400, October 1975.

IV. PREREQUISITES

A. Projected whole body and thyroid dose rates, as well as integrated doses for critical receptor site locations, have been calculated in accordance with EPIP 5.7.17, Dose Assessment, and such doses warrant recommending protective actions.

V. LIMITATIONS

A. The projected dose and affected off-site areas will depend upon the curies released, release rate, duration of release, isotopic mixture of the release, which varies with effective age, and existing meteorological conditions. The impact of these factors must be assessed in determining the projected dose.

B. PAGs for the general public are given in ranges. The lowest values should be used if there are no major local constraints in providing protection at this level. Local constraints may, however, make the lower values impractical to use, but in no case should the higher value be exceeded in determining a need for protective action.

VI. PRECAUTIONS

A. A protective action guide under no circumstances implies an acceptable dose.

B. Selection of protective actions must be considered subjectively, as conditions beyond the scope of this procedure may exist which, in the opinion of the Emergency Director, override the criteria contained in this procedure.

VII. EQUIPMENT

A. None.

VIII. PROCEDURE

A. Protective Action Guides.

1. The Radiological Assessment Coordinator will periodically update and refine dose assessments for critical receptor site locations in accordance with EPIP 5.7.17, Dose Assessment. He will then relay updated projected doses to the Emergency Director. Attachment "E" may be used as an aid to determine protective actions based on release information.

2. Based upon the projected doses and the guidance given in Attachment "A", the Emergency Director will determine if appropriate protective actions need to be implemented.

3. Should the projected doses indicate that sheltering or evacuation should be considered, the Emergency Director will determine the effectiveness of these protective actions as described in detail below.

a. Sheltering effectiveness

1) If necessary, recommend that officials warn the affected population to:

a) Seek shelter.

b) Close windows.

c) Turn off ventilation systems.

d) Seal cracks in doors with wet rags.

2) Control access to the affected area.

3) Evaluate the possibility of evacuation after the plume has passed:

a) After the plume has passed, evaluate the significance of ground deposition in accordance with EPIP 5.7.18, Off-Site And Site Boundary Monitoring.

1. Determine if dose rates are sufficient to warrant subsequent evacuation.

   a. Multiply the projected dose by the external factor (shielding factor for external whole body gamma doses are presented in Attachment "B"). Compare the projected dose to the PAG for whole body gamma dose.

2. Evaluate the significance of inhalation dose (shielding factors for inhalation doses are presented in Attachment "C"). Shielding factors are for a sealed, wood-frame house.

   a. Multiply the projected dose by the inhalation shielding factor to determine the reduction in inhalation dose from the plume. Compare the projected dose to the PAG for thyroid dose.

3. Determine the critical organ of concern, the whole body or the thyroid. Compare the PAG for the critical organ to the PAG for that organ.

b. Evacuation effectiveness.

1) The effectiveness of evacuation in limiting radiation dose is a function of:

a) Time required to evacuate - obtain evacuation times, T(EV), from Attachment "D" Evacuation Times. Alternatively, T(EV) may be estimated as follows:

$$T(EV) = T_D + T_N + T_M + T_T$$

Where:

T_D = Time delay after occurrence of the incident associated with notification of responsible officials, interpretation of data, and the decision to evacuate as a protective action.

T_N = Time required by officials to notify people to evacuate.

T_M = Time required for people to mobilize and get under way.

T_T = Travel time required to leave the affected areas.

If evacuation is completed before the plume arrives, then evacuation is 100% effective.

b) Time of exposure to the plume - Determine the plume arrival time T(PA) as follows:

$T(PA) = T_B + T_T$

Where:

T_B = Time projected before release begins.

T_T = Time projected for plume travel for given windspeed and downwind distances from the start of release. To calculate T_T refer to EPIP 5.7.17, Dose Assessment.

Evaluate constraints against evacuation. Compare the evacuation time T(EV) with the estimated plume arrival time T(PA).

1. If there is time to evacuate before the plume arrives, there are no local constraints, evacuation appears to offer a significant reduction in dose, and the societal benefits outweigh the societal cost, recommend evacuation.

2. In cases where there is no time to evacuate prior to the arrival of the plume arrival time and evacuation time are nearly equal and/or there are local constraints, again evaluate the benefits of sheltering (vs. the potential risks of evacuation).

IX. ATTACHMENTS

A. Attachment "A", Recommended Protective Actions To Reduce Whole Body And Thyroid Dose From Exposure to a Gaseous Plume.

B. Attachment "B", In External Gamma Dose From Passing Cloud.

C. Attachment "C", Reduction In Inhalation dose From Pass Cloud.

D. Attachment "D", Estimated Evacuation Times.

E. Attachment "E", Gross Protective Action Guides.

RECOMMENDED PROTECTIVE ACTIONS
TO REDUCE WHOLE BODY AND THYROID DOSE FROM EXPOSURE TO A GASEOUS PLUME

PROJECTED DOSE (REM) TO THE POPULATION	RECOMMENDED ACTIONS (a)	COMMENTS
Whole Body - < 1 Thyroid - < 5	No planned protective actions (b). Off-site authorities may issue an advisory to seek shelter and await further instructions. Monitor environmental radiation levels.	Previously recommended; protective actions may be reconsidered or terminated.
Whole Body - 1 to 5 Thyroid - 5 to 25	Seek shelter as a minimum. Consider evacuation/unless constraints make it impractical. Monitor environmental radiation levels. Control access to affected areas.	If constraints exist to prevent full-scale evacuation, special consideration be given for evacuation of children and pregnant women.
Whole Body - 5 And Above Thyroid - 25 And Above	Conduct mandatory evacuation. Monitor environmental radiation levels and adjust area for mandatory evacuation based on these levels. Control access to affected areas.	Sheltering is an alternative if evacuation cannot be promptly accomplished.

(a) These actions are recommended for planning purposes. Protective action decisions at the time of the incident must take existing conditions into consideration (e.g. weather, plume arrival time).

(b) At the time of the incident, officials may implement low-impact protective actions in keeping with the principle of maintaining radiation exposures as low as reasonably achievable (ALARA).

REDUCTION IN EXTERNAL GAMMA DOSE FROM PASSING CLOUD

STRUCTURE OR LOCATION	SHIELDING FACTOR[a] AVERAGE	SHIELDING FACTOR[a] RANGE
Outside	1.0	---
Vehicles	1.0	---
Wood Frame House (No Basement)[b]	0.9	---
Basement Of Wood House	0.6	0.1 to 0.7[c]
Masonry House (No Basement)	0.6	0.4 to 0.7[c]
Basement of Masonry House	0.4	0.1 to 0.5[c]
Large Office or Industrial Building	0.2	0.1 to 0.3[c][d]

TES:

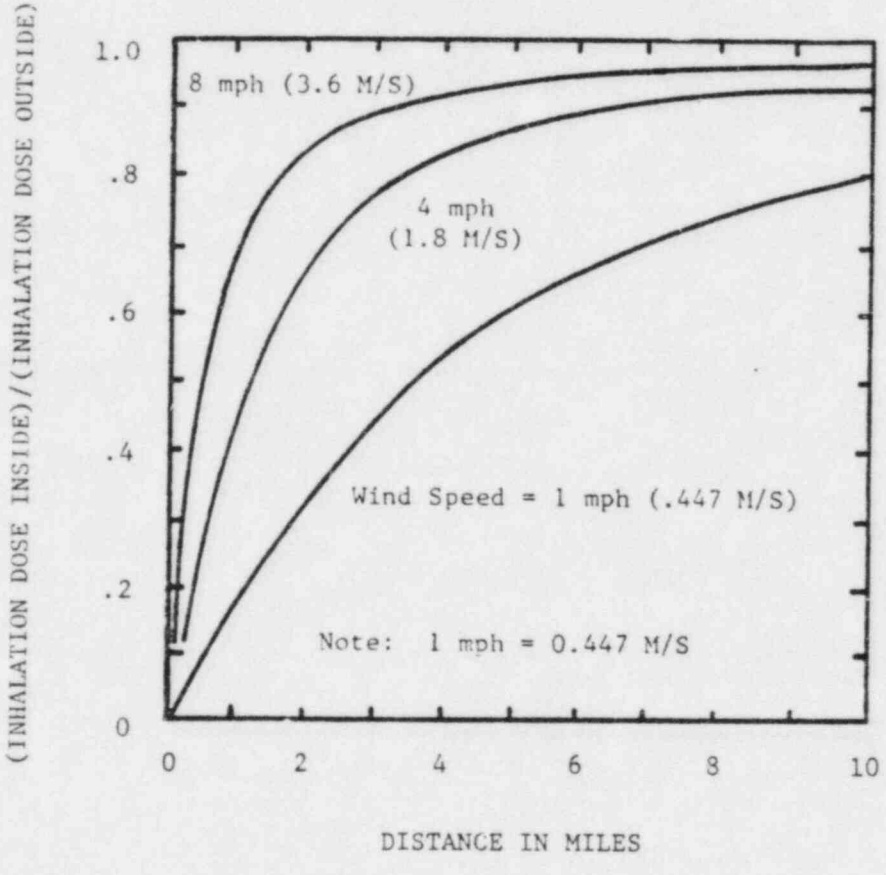
(a) The ratio of the interior dose to the exterior dose.

(b) A wood frame house with brick or stone veneer is approximately equivalent to a house for shielding purposes.

(c) This range is mainly due to different wall materials and different geometries.

(d) The reduction factor depends on where the personnel are located within the building (e.g. the basement or an inside room).

INHALATION SHIELDING FACTORS FOR
A WOOD HOUSE, SNUG DOORS, CLOSED WINDOWS



ESTIMATED EVACUATION TIMES

SECTOR RADIUS (MILES)	SECTOR	POPULATION	EVACUATION ROUTE	EVACUATION TIME (MINUTES) NORMAL	ADVERSE
1-2	A*	0		----	----
1-2	B*	4	9.2 Miles; Gravel Road to U.S. 136 East	18.5	55.25
1-2	C*	0		----	----
1-2	D*	0		----	----
1-2	E*	6	9.9 Miles; Route U To U.S. 136 East	19.9	59.5
1-2	F*	4	10.3 Miles; Route U East To 111 to U.S. 136 East	20.7	61.8
1-2	G*	0		----	----
1-2	H*	0		----	----
1-2	J*	0		----	----
1-2	K*	0		----	----
1-2	L	3	Northeast U.S. 67 South To U.S. 73 South To Falls City	26.0	83.0
1-2	M*	0		----	----
1-2	N	5	U.S. 136 West To U.S. 73/75 North To Nebraska City	26.0	83.0
1-2	P	4	U.S. 136 West To U.S. 73/75 North To Nebraska City	26.0	83.0
1-2	Q*	0		----	----
1-2	R*	0		----	----
2-5	A*	18	9.7 Miles; U.S. 136 East	19.7	58.8
2-5	B*	30	8.7 Miles; U.S. 136 East	17.8	53.4
2-5	C*	45	7.7 Miles; U.S. 136 East	16.0	48.0

ESTIMATED EVACUATION TIMES

SECTOR RADIUS (MILES)	SECTOR	POPULATION	EVACUATION ROUTE	EVACUATION TIME (MINUTES) NORMAL	ADVERSE
2-5	D*	215	8.6 Miles; Route U to U.S. 136 East	20.2	60.5
2-5	E*	110	8.9 Miles; Route E to U.S. 136 East	18.3	57.8
2-5	F*	37	9.8 Miles; Route U to Route E to Route 111 To U.S. 136 East	20.1	60.2
2-5	G*	15	12.4 Miles; Route U to Route E to Route 111 To U.S. 136 East	25.0	74.9
2-5	H*	5	13.3 Miles; Route U to Route E to Route 111 To U.S. 136 East	26.7	79.8
2-5	J	7	Northeast U.S. 67 South To U.S. 73 South To Falls City	19.7	62.0
2-5	K	17	Northeast U.S. 67 South To U.S. 73 South To Falls City	19.7	62.0
2-5	L	210	Northeast U.S. 67 South To U.S. 73 South To Falls City	19.7	62.0
2-5	M	26	Northeast U.S. 67 South To U.S. 73 South To Falls City	19.7	62.0
2-5	N	24	U.S. 136 West To U.S. 73/75 North To Nebraska City	19.7	62.0
2-5	P	46	U.S. 136 West To U.S. 73/75 North To Nebraska City	19.7	62.0
2-5	Q	42	U.S. 136 West To U.S. 73/75 North To Nebraska City	19.7	62.0
2-5	R	187	U.S. 136 West To U.S. 73/75 North To Nebraska City	19.7	62.0
5-10	A*	442	3.3 Miles; Route B East	12.4	38.4
5-10	B*	151	4.7 Miles; Route D to Route B East	11.5	34.4

ESTIMATED EVACUATION TIMES

SECTOR RADIUS (MILES)	SECTOR	POPULATION	EVACUATION ROUTE	EVACUATION TIME (MINUTES) NORMAL	ADVERSE
5-10	C*	635	5.3 Miles; U.S. 275 to U.S. 136 East	19.5	58.4
5-10	D*	1515	3.0 Miles; U.S. 136 East	27.2	81.7
5-10	E*	159	6.2 Miles; Route 111 To U.S. 136 East	14.6	43.8
5-10	F*	59	5.8 Miles; Route 2 To Route J East	12.6	37.2
5-10	G*	95	6.9 Miles; Route 2 To Route J East	14.6	43.7
5-10	H	69	Route U To Route E to Route 111 To U.S. 136 To Maryville	14.6	43.7
5-10	J	115	Northeast U.S. 67 South To U.S. 73 South To Falls City	14.6	43.7
5-10	K	333	Northeast U.S. 67 South To U.S. 73 South To Falls City	14.6	43.7
5-10	L	79	Northeast U.S. 67 South To U.S. 73 South To Falls City	14.6	43.7
5-10	M	111	Northeast U.S. 67 South To U.S. 73 South To Falls City	14.6	43.7
5-10	N	82	U.S. 136 West To U.S. 73/75 North To Nebraska City	12.4	38.4
5-10	P	107	U.S. 136 West To U.S. 73/75 North To Nebraska City	12.4	38.4
5-10	Q	148	U.S. 67 West To U.S. 73/75 North To Nebraska City	12.4	38.4
5-10	R	1236	U.S. 67 West To U.S. 73/75 North To Nebraska City	12.4	38.4

*Data Obtained From Evacuation Time Estimate Study January, 1981.

GROSS PROTECTIVE ACTION GUIDES

In the rages shown, the lowest value should be used if there are no major local constraints in providing protection at that level, especially to sensitive populations. Local constraints may make lower values impractical to use, but in no case should the higher value be exceeded in determining the need for protective action.

The attached chart may be used for preliminary determination of the Integrated Doses for downwind receptor points during an accident situation at CNS.

Calculation of time before Protective Action Guides (PAGs) are reached may be done using the following formula and attached Table. The Table includes PAGs for the Projected Whole Body Gamma Dose (Rem) and Projected Thyroid Dose (Rem) for Atmospheric Stability Classes B, D, and F. Each stability class if divided into wind speeds of 22.5, 10, and 5 mph. The stability classes represent a bracketing of the seven (7) Pasquill Categories of A, B, C, D, E, F, and G. The listed wind speeds are intended to bracket winds experienced 90% of the time at CNS. For wind speeds between those listed the more conservative (safe) times should be used.

The following formula shall be used to calculate the Actual Time (HOURS) to reach PAGs, based on Actual Emission Rates in Ci/Sec.

$$\frac{100 \text{ Ci/Sec}}{\text{Actual Emission Rate (Ci/Sec)}} \times \text{Chart Time} = \text{Actual Time (Hours) To Reach PAGs}$$

GROSS PROTECTIVE ACTION GUIDES

STABILITY CLASS A, B									
WIND VELOCITY MPH	PROTECTIVE* ACTION GUIDES		TIME (HOURS) TO REACH PROTECTIVE ACTION GUIDE (PAGE) INTEGRATED DOSE AT AN ERP RELEASE RATE OF 100 Ci/Sec DISTANCE DOWNWIND OF CNS - (MILES)							
			1.5	2.5	3.5	5	10	20	35	50
22.5	THYROID -	5 REM-PAG	94	227	312	416	757	1388	2272	----
		25 REM-PAG	471	1136	1562	2083	3787	6944	11363	----
	EXTERNAL -	1 REM-PAG	188	454	625	833	1639	3225	----	----
		5 REM-PAG	943	2272	3125	4166	8196	16129	----	----
10	THYROID -	5 REM-PAG	41	102	131	185	333	1724	----	----
		25 REM-PAG	208	510	657	925	1666	8620	----	----
	EXTERNAL -	1 REM-PAG	83	212	285	400	833	5000	----	----
		5 REM-PAG	416	1063	1428	2000	4166	25000	----	----
5	THYROID -	5 REM-PAG	20	50	66	90	250	757	----	----
		25 REM-PAG	104	250	333	454	1250	3787	----	----
	EXTERNAL -	1 REM-PAG	45	107	151	222	500	2941	----	----
		5 REM-PAG	227	537	757	1111	2500	14700	----	----

STABILITY CLASS C, D									
WIND VELOCITY MPH	PROTECTIVE* ACTION GUIDES		TIME (HOURS) TO REACH PROTECTIVE ACTION GUIDE (PAGE) INTEGRATED DOSE AT AN ERP RELEASE RATE OF 100 Ci/Sec DISTANCE DOWNWIND OF CNS - (MILES)							
			1.5	2.5	3.5	5	10	20	35	50
22.5	THYROID -	5 REM-PAG	18	22	31	41	100	238	500	----
		25 REM-PAG	92	113	156	208	500	1190	2500	----
	EXTERNAL -	1 REM-PAG	37	45	62	90	217	555	1298	----
		5 REM-PAG	185	227	312	454	1086	2777	6493	----
10	THYROID -	5 REM-PAG	8	9	13	19	45	416	----	----
		25 REM-PAG	40	49	65	96	227	2083	----	----
	EXTERNAL -	1 REM-PAG	16	20	27	43	107	1176	----	----
		5 REM-PAG	83	102	138	217	537	5882	----	----
5	THYROID -	5 REM-PAG	4	5	6	9	22	156	----	----
		25 REM-PAG	20	25	32	48	113	781	----	----
	EXTERNAL -	1 REM-PAG	8	11	15	23	66	625	----	----
		5 REM-PAG	41	56	75	116	333	3125	----	----

*Refer To Page 1 Of This Attachment.

GROSS PROTECTIVE ACTION GUIDES

STABILITY CLASS E, F, G									
WIND VELOCITY MPH	PROTECTIVE* ACTION GUIDES		TIME (HOURS) TO REACH PROTECTIVE ACTION GUIDE (PAGE) INTEGRATED DOSE AT AN ERP RELEASE RATE OF 100 Ci/Sec DISTANCE DOWNWIND OF CNS - (MILES)							
			1.5	2.5	3.5	5	10	20	35	50
22.5	THYROID -	5 REM-PAG	----	250	106	63	53	71	106	----
		25 REM-PAG	----	----	531	316	265	357	531	----
	EXTERNAL -	1 REM-PAG	----	500	217	131	114	169	285	----
		5 REM-PAG	----	2500	1086	657	574	847	1428	----
10	THYROID -	5 REM-PAG	----	108	45	27	23	178	----	----
		25 REM-PAG	----	543	227	138	119	892	----	----
	EXTERNAL -	1 REM-PAG	----	227	100	62	58	500	----	----
		5 REM-PAG	----	1136	500	312	294	2500	----	----
5	THYROID -	5 REM-PAG	833	54	22	14	12	72	----	----
		25 REM-PAG	4166	271	113	71	60	362	----	----
	EXTERNAL -	1 REM-PAG	----	120	52	34	35	294	----	----
		25 REM-PAG	----	602	263	172	178	1470	----	----

*Refer To Page 1 Of This Attachment.

I. PURPOSE

This procedure provides a means of insuring the operational readiness and availability of equipment required for the immediate action steps of all four Emergency Classification action levels.

II. DISCUSSION

As an emergency situation progresses, conditions may arise which require augmentation of emergency equipment. The necessary equipment will be utilized on an as-needed basis to support the emergency operations.

III. REFERENCE MATERIAL

A. CNS Emergency Plan.

B. NUREG 0654, Revision 1.

IV. PREREQUISITES

A. None.

V. LIMITATIONS

A. None.

VI. PRECAUTIONS

A. None.

VII. EQUIPMENT

A. Equipment covered by this procedure includes:

1. First aid and rescue equipment.

2. Respiratory protection equipment.

3. Vehicles and radio equipment.

4. Radiation detection equipment.

5. Decontamination equipment and supplies.

6. General emergency equipment and supplies.

III. PROCEDURE

A. Emergency Equipment Inventory.

1. Once per quarter and/or after use emergency equipment will be inventoried and the equipment calibrations checked. Operability and equipment maintenance will be conducted in accordance with normal station procedures.

2. During inspection any equipment found inoperative or out of calibration shall be replaced in a timely manner.

3. During inspection any deficiency of inventory shall be resolved by replacement in a timely manner.

4. Normal use equipment located in the OSCs may be used during emergency situations. This was one of the criteria of the placement of the OSCs, personnel assembled at these locations will have access to equipment and supplies they are familiar with in their normal duties that may be used during an emergency and dependent upon the emergency condition.

IX. ATTACHMENTS

A. Attachment "A", Emergency Equipment Maintained At Control Room.

B. Attachment "B", Emergency Equipment Maintained At TSC.

C. Attachment "C", Emergency Equipment Maintained At OSCs.

D. Attachment "D", Emergency Equipment Maintained At EOF.

E. Attachment "E", Emergency Equipment Maintained At AEOF.

F. Attachment "F", Emergency Equipment Maintained For Ambulance.

G. Attachment "G", Emergency Equipment Maintained At Hospital.

H. Attachment "H", Emergency Vehicles Maintained At CNS.

EMERGENCY EQUIPMENT MAINTAINED AT CONTROL ROOM

A. General Supplies.

	Item	Quantity
1.	Coveralls, Large.	4 Each
2.	Hood, Canvas.	4 Each
3.	Shoe Covers, Latex.	12 Pairs
4.	Shoe Covers, Canvas.	8
5.	Gloves, Surgeon's.	24 Pairs
6.	Glove Liners, White Cotton.	24 Pairs
7.	Gloves, Plastic Covered.	4 Pairs
8.	Gloves, White Cotton (Work).	12 Pairs
9.	Extended Probe Teletector (Range 0-1,000 R/Hr).	1 Each
10.	Geiger-Mueller Survey Meter (Range 0-50 mR/Hr).	1 Each
11.	Ion-Chamber RO-2 (Range 0-50 R/Hr).	1 Each
12.	Dosimeter, Direct Reading (1 R).	6 Each
13.	Dosimeter, Direct Reading (0-10 R).	4 Each
14.	Dosimeter, Direct Reading (0-200 mR).	4 Each
15.	Dosimeter Charger.	1 Each
16.	Batteries For Dosimeter Charger.	1 Set
17.	Thyroid Blocking Tablets.	10 Bottles

B. Respiratory Protection Equipment.

	Item	Quantity
1.	Air Breathing Masks (Self-Contained) (Complete In Case, 45 Ft^3 Tank).	3 Each
2.	Full Face Filter Masks With Filters.	30 Each

EMERGENCY EQUIPMENT MAINTAINED AT CONTROL ROOM

B. Respiratory Protection Equipment (Continued).

Item	Quantity
3. Spare 45 Ft^3 Air Cylinders.	3 Each

*Note: The air breathing equipment is not within the Emergency Box but the cases are rack-wall-mounted near the Emergency Box for convenience, inspection, and maintenance.

C. Miscellaneous (Supplies).

Item	Quantity
1. Masking Tape, Paper, 2".	3 Rolls
2. Masking Tape, Cloth, 2".	3 Rolls
3. Plastic Sheeting, 20' x 20'.	2 Sheets
4. Plastic Bag, Small.	1 Box
5. Plastic Bag, Large.	6 Each
6. Radiation Warning Signs.	12 Each
7. File Cards, 3" x 5".	1 Package
8. Radiation Barrier Rope, 200'.	1 Coil
9. Smear Papers, 100s.	12 Boxes
10. Radiation Warning Tape.	1 Roll
11. Pad, Paper, 8 1/2" x 11".	2 Each
12. Pad, Paper, 5" x 8".	2 Each
13. Pencils, Lead.	6 Each
14. Pencils, Grease Type, Red.	6 Each
15. Stapler With Staples.	1 Each
16. Envelopes, Manila, 3" x 5", 100s.	2 Each

EMERGENCY EQUIPMENT MAINTAINED AT CONTROL ROOM

C. Miscellaneous (Supplies) (Continued).

Item	Quantity
17. Clipboards.	2 Each
18. Hand Lantern, Battery Type.	2 Each
19. Flashlight, Battery Type.	2 Each
20. Sets Of Batteries For Hand Lantern.	2 Sets
21. Sets Of Batteries For Flashlights.	2 Sets
22. Scissors, Blunt Point, 6".	1 Set
23. Step-Off Pad.	2 Each
24. First Aid Kit.	1 Each
25. General Arrangement Drawing.	1 Set
26. Survey Map.	1 Each
27. Canister (Spare).	12 Each
28. Scotch Tape And Dispenser.	1 Each
29. Potassium Iodide Leaflets.	100 Copies
30. Emergency Procedure 5.4.1, General Fire.	1 Copy

EMERGENCY EQUIPMENT MAINTAINED AT TSC

A. Equipment And Reference Documents.

	Item	Quantity
1.	Copy Machine.	1 Each
2.	Telecopier.	1 Each
3.	Telephones; Includes NRC Extensions.	9 Each
4.	Radio Remote Control Units.	2 Each
5.	Zytron Terminals.	1 Each
6.	Alternate Intercom (Bone Phone).	1 Each
7.	Dose Assessment Equipment.	
	a. Computer Terminal.	1 Each
	b. Inopleths, Maps.	1 Set
8.	CNS Technical Specifications.	1 Set
9.	CNS Updated Safety Analysis Report.	1 Set
10.	Flow Diagrams And Drawings.	1 Set
11.	State Emergency Response Plans (Nebraska, Missouri, Kansas, And Iowa).	1 Each
12.	Local Emergency Response Plans (Otoe Relocation Plan, Nebraska EPZ Evacuation Study, Nemaha, Richardson, And Atchison Counties).	1 Each
13.	Emergency Plan, Complete Set Of EPIPs, And Emergency Telephone Directory.	1 Each

B. General Supplies.

	Item	Quantity
1.	Coveralls, Large.	4 Each
2.	Hood, Canvas.	4 Each
3.	Shoe Covers, Latex.	12 Pairs

EMERGENCY EQUIPMENT MAINTAINED AT TSC

B. General Supplies (Continued).

	Item	Quantity
4.	Shoe Covers, Canvas.	8 Pairs
5.	Gloves, Surgeon's.	24 Pairs
6.	Glove Liners, White Cotton.	24 Pairs
7.	Gloves, Plastic Covered.	4 Pairs
8.	Gloves, White Cotton (Work).	12 Pairs
9.	Masking Tape.	2 Rolls
10.	Ion-Chamber RO-2 (Range 0-50 R/Hr).	1 Each
11.	Dosimeter, Direct Reading (1 R).	5 Each
12.	Dosimeter Charger.	1 Each
13.	Batteries For Dosimeter Charger.	1 Set
14.	Sound Power Set.	2 Sets
15.	Sound Power Extensions.	2 Sets
16.	Flashlights.	2 Each
17.	Flashlight Batteries.	6 Sets
18.	Self-Contained Breathing Apparatus.	4 Each
19.	Spare Bottles For SCBA.	2 Each
20.	Full Face Particulate Respirators And Cartridges.	6 Each
21.	Thyroid Blocking Tablets.	10 Bottles
22.	Clipboards.	2 Each
23.	Step-Off Pads.	1 Each
24.	Emergency Action Logs.	10 Pads

EMERGENCY EQUIPMENT MAINTAINED AT TSC

C. EPIPs For Emergency Use.

EPIP Number	Title	Quantity
5.7.1	Emergency Classification	2 Copies
5.7.2	NOTIFICATION OF UNUSUAL EVENT Implementing Actions	2 Copies
5.7.3	ALERT Implementing Actions	2 Copies
5.7.4	SITE AREA EMERGENCY Implementing Actions	4 Copies
5.7.5	GENERAL EMERGENCY Implementing Actions	4 Copies
5.7.6	Notification	10 Copies
5.7.7	Activation Of TSC	10 Copies
5.7.10	Personnel Assembly And Accountability	5 Copies
5.7.11	Evacuation Of Non-Essential Site Personnel	10 Copies
5.7.13	Personnel Monitoring And Decontamination	10 Copies
5.7.14	Stable Iodide Thyroid Blocking	4 Copies
5.7.15	Rescue And Re-Entry	3 Copies
5.7.16	Release Rate Determination	2 Copies
5.7.17	Dose Assessment	14 Copies
5.7.18	Off-Site And Site Boundary Monitoring	5 Copies
5.7.19	On-Site Radiological Monitoring	2 Copies
5.7.23	Media	5 Copies
5.7.24	Medical	4 Copies

EMERGENCY EQUIPMENT MAINTAINED AT OSCs

A. Chemistry And Health Physics OSC.

1. General Supplies.

Item	Quantity
a. Clipboards.	4 Each
b. Note Pads.	4 Each
c. Pencils.	12 Each
d. Flashlights.	3 Each
e. Masking Tape.	2 Rolls
f. Emergency Action Log.	2 Pads
g. Dosimeters (1 R).	5 Each
h. High Range Survey Instrument.	2 Each
i. RO-2.	2 Each
j. Hi-Volume Air Sampler.	*
k. Particulate Filters, 2" And 4".	20 Each
l. Charcoal And Silver Zeolite, Cartridges.	10 Each
m. Air Sample Plastic Bags And Labels.	20 Each
n. Smear Supplies, Books.	10 Each
o. Batteries For Flashlights.	3 Sets
p. Dosimeter Charger.	1 Each
q. Batteries For Charger.	1 Set
r. Step-Off Pads.	1 Set
s. Area Roster Sheet.	1 Each

*Available From Normal Use Work Area.

EMERGENCY EQUIPMENT MAINTAINED AT OSCs

2. Protection Equipment.

Item	Quantity
a. Protective Clothing (Full Set).	6 Each
b. Self-Contained Breathing Apparatus.	4 Each
c. Spare Bottles.	2 Each
d. Thyroid Blocking Tablets.	10 Bottles

3. EPIPs For Emergency Use.

EPIP Number	Title	Quantity
5.7.8	Activation Of OSCs	5 Copies
5.7.10	Personnel Assembly And Accountability	2 Copies
5.7.13	Personnel Monitoring And Decontamination	10 Copies
5.7.15	Rescue And Re-Entry	5 Copies
5.7.19	On-Site And Radiological Monitoring	5 Copies
5.7.24	Medical	3 Copies

B. I & C/Electrical OSC.

1. General Supplies.

Item	Quantity
a. Dosimeters (1 R).	5 Each
b. Survey Instruments (Cutie Pie).	1 Each
c. Masking Tape.	2 Rolls
d. I & C/Electrical Tool Kits.	4 Each
e. Flashlights.	4 Each
f. Simpson VOM.	2 Each

EMERGENCY EQUIPMENT MAINTAINED AT OSCs

1. General Supplies (Continued).

Item	Quantity
g. Sound Power Sets.	2 Each
h. Sound Power Extensions.	2 Each
i. Emergency Action Logs.	2 Pads
j. Pencils.	10 Each
k. Batteries For Flashlights.	4 Sets
l. Dosimeter Charger.	1 Each
m. Batteries For Charger.	1 Set
n. Step-Off Pads.	2 Each
o. Area Roster Sheet.	1 Each

2. Protection Equipment.

Item	Quantity
a. Protective Clothing (Full Set).	6 Each
b. Self-Contained Breathing Apparatus.	4 Each
c. Spare Bottles.	2 Each
d. Full Face Particulate Respirators And Cartridges.	6 Each
e. Thyroid Blocking Tablets.	10 Bottles

3. EPIPs For Emergency Use.

EPIP Number	Title	Quantity
5.7.8	Activation Of OSCs	5 Copies
5.7.10	Personnel Assembly And Accountability	2 Copies
5.7.13	Personnel Monitoring And Decontamination	10 Copies

EMERGENCY EQUIPMENT MAINTAINED AT OSCs

3. EPIPs For Emergency Use (Continued).

EPIP Number	Title	Quantity
5.7.15	Rescue And Re-Entry	5 Copies
5.7.24	Medical	3 Copies

C. Mechanical Maintenance OSC.

1. General Supplies.

Item	Quantity
a. Dosimeters (1 R).	5 Each
b. Survey Instruments (Cutie Pie).	1 Each
c. Masking Tape.	2 Rolls
d. Flashlights.	4 Each
e. Emergency Action Logs.	2 Pads
f. Pencils.	10 Each
g. Batteries For Flashlights.	4 Sets
h. Dosimeter Charger.	1 Each
i. Batteries For Charger.	1 Set
j. Step-Off Pads.	2 Each
k. Area Roster Sheet.	1 Each

2. Protection Equipment.

Item	Quantity
a. Protective Clothing (Full Set).	6 Each
b. Self-Contained Breathing Apparatus.	4 Each
c. Spare Bottles.	2 Each

EMERGENCY EQUIPMENT MAINTAINED AT OSCs

2. Protection Equipment (Continued).

Item	Quantity
d. Full Face Particulate Respirators And Cartridges.	6 Each
e. Thyroid Blocking Tablets.	10 Bottles

3. EPIPs For Emergency Use.

EPIP Number	Title	Quantity
5.7.8	Activation Of OSCs	5 Copies
5.7.10	Personnel Assembly And Accountability	2 Copies
5.7.13	Personnel Monitoring And Decontamination	10 Copies
5.7.15	Rescue And Re-Entry	5 Copies
5.7.24	Medical	3 Copies

EMERGENCY EQUIPMENT MAINTAINED AT EOF

A. General Supplies.

	Item	Quantity
1.	Coveralls, Large.	6 Each
2.	Hood, Canvas.	6 Each
3.	Shoe Covers, Latex.	12 Pairs
4.	Shoe Covers, Canvas.	12 Pairs
5.	Gloves, Surgeon's.	24 Pairs
6.	Glove Liners, White Cotton.	24 Pairs
7.	Gloves, Plastic Covered.	8 Pairs
8.	Hard Hat.	6 Each
9.	Gloves, White Cotton (Work).	12 Pairs
10.	Extendable Probe Survey Instrument (Range 0-1,000 R/Hr).	2 Each
11.	Ion-Chamber Survey Meter (Range 0-50 R/Hr).	2 Each
12.	Geiger-Mueller Survey Meter (Range 0-50 mR/Hr).	4 Each
13.	Ion-Chamber (Range 0-25 R/Hr).	2 Each
14.	Sample Holder With Pancake Type Detector.	1 Each
15.	Scaler Electronic Package (MS-2 Or LCS-1).	1 Each
16.	Dosimeter, Direct Reading (1 R).	6 Each
17.	Dosimeter, Direct Reading (0-10 R).	6 Each
18.	Dosimeter, Direct Reading (0-200 mR).	4 Each
19.	Dosimeter Charger.	1 Each
20.	Batteries For Dosimeter Charger.	1 Set
21.	Portable Air Sampler (High Volume) (60 Hz, 120 V AC).	3 Each
22.	Portable Air Sampler (Low Volume).	1 Each

EMERGENCY EQUIPMENT MAINTAINED AT EOF

A. General Supplies (Continued).

Item	Quantity
23. Inverter (12 V DC To 120 V AC).	2 Each
24. Filters For Air Samplers:	
a. 4" For High Volume.	100 Each
b. 47 mm For Low Volume.	100 Each
25. Charcoal Filter For Air Samplers.	25 Each
26. Silver Zeolite Cartridges For Air Samplers.	25 Each
27. Extension Cord, Electric (50').	2 Each
28. Off-Site Radios (Low Band).	2 Each

B. Respiratory Protection Equipment*.

Item	Quantity
1. Air Breathing Masks (Self-Contained) (Complete In Case, 45 Ft^3 Tank).	4 Each
2. Full Face Filter Masks With Filters.	6 Each
3. Spare 45 Ft^3 Air Cylinders.	2 Each

*Note: The air breathing equipment is not within the Emergency Box but the cases are rack-wall-mounted near the Emergency Box for convenience, inspection, and maintenance.

C. Miscellaneous (Supplies).

Item	Quantity
1. Masking Tape, Paper, 2".	3 Rolls
2. Masking Tape, Cloth, 2".	3 Rolls
3. Plastic Sheeting, 20' x 20'.	2 Sheets
4. Plastic Bag, Small.	1 Box

EMERGENCY EQUIPMENT MAINTAINED AT EOF

C. Miscellaneous (Supplies) (Continued).

	Item	Quantity
5.	Plastic Bag, Large.	6 Each
6.	Radiation Warning Signs.	12 Each
7.	File Cards, 3" x 5".	1 Package
8.	Radiation Barrier Rope, 200'.	1 Coil
9.	Smear Papers, 100s.	12 Boxes
10.	Radiation Warning Tape.	1 Roll
11.	Pad, Paper, 8 1/2" x 11".	6 Each
12.	Pad, Paper, 5" x 8".	6 Each
13.	Pencils, Lead.	6 Each
14.	Pencils, Grease Type, Red.	6 Each
15.	Stapler With Staples.	1 Each
16.	Envelopes, Manila, 3" x 5", 100s.	2 Each
17.	Clipboards.	4 Each
18.	Hand Lantern, Battery Type.	3 Each
19.	Flashlight, Battery Type.	2 Each
20.	Sets Of Batteries For Hand Lantern.	3 Sets
21.	Sets Of Batteries For Flashlights.	2 Sets
22.	Flares, Railroad Type.	6 Each
23.	Pocket Knife.	1 Each
24.	Small Hand Tool Kit With Straight Slot Screwdriver, Phillips Screwdriver, Small Pliers, And Small Vise Grip.	1 Each
25.	Scissors, Blunt Point, 6".	1 Each

EMERGENCY EQUIPMENT MAINTAINED AT EOF

C. Miscellaneous (Supplies) (Continued).

	Item	Quantity
26.	Shovel.	1 Each
27.	Vials, 5 ml.	12 Each
28.	Pipette With Rubber Bulb.	12 Each
29.	Liter Bottle.	6 Each
30.	Step-Off Pads.	2 Each
31.	Area Roster Sheet.	1 Each

D. Personnel Decontamination Supplies.

	Item	Quantity
1.	Potassium Permanganate.	6 Vials
2.	Instructions For Making 4% Solution Of Potassium Permanganate.	1 Set
3.	Sodium Bisulfite.	6 Vials
4.	Titanium Dioxide.	3 Jars
5.	Alkanox.	2 Cans
6.	Tide, Detergent Soap.	1 Box
7.	Septisol (Germicide).	1 Can
8.	Lanolin.	1 Jar
9.	Swabs, Cotton Tipped, 100s.	3 Packages
10.	Compresses, Gauze, 3" X 3", 100s.	2 Packages
11.	Towels, Paper.	1 Roll
12.	Beaker, Plastic, 100 ml.	3 Each
13.	Hand Brush.	2 Each
14.	Thyroid Blocking Tablets.	1350 Bottles

EMERGENCY EQUIPMENT MAINTAINED AT EOF

E. First Aid And Rescue Equipment.

Item	Quantity
1. First Aid Kit.	1 Each
2. Stretcher*.	1 Each
3. Rope, 1/2" - 50'.	1 Coil

*Note: Stretcher stored near Emergency Box.

F. Additional Equipment And Reference Documents.

Item	Quantity
1. Copy Machine.	1 Each
2. Telecopiers.	2 Each
3. Typewriter.	1 Each
4. Telephones.	10 Each
5. C.D. Intercom.	1 Each
6. Radio Remote Control Units.	2 Each
7. Portable Radios (Low Band).	2 Each
8. Alternate Intercom (Bone Phone).	1 Each
9. Dose Assessment Equipment:	
a. Computer Terminal.	1 Each
b. Inopleths, Maps.	1 Set
10. CNS Technical Specifications.	1 Set
11. CNS Updated Safety Analysis Report.	1 Set
12. Flow Diagrams And Drawings.	1 Set
13. State Emergency Response Plans (Nebraska, Missouri, Kansas, And Iowa).	1 Each

EMERGENCY EQUIPMENT MAINTAINED AT EOF

F. Additional Equipment And Reference Documents (Continued).

	Item	Quantity
14.	Local Emergency Response Plans (Otoe Relocation Plan, Nebraska EPZ Evacuation Study, Nemaha, Richardson, and Atchison Counties).	1 Each
15.	Emergency Plan, Complete Set Of EPIPs, And Emergency Telephone Directory.	2 Each

G. EPIPs For Emergency Use.

EPIP Number	Title	Quantity
5.7.1	Emergency Classification	2 Copies
5.7.2	NOTIFICATION OF UNUSUAL EVENT Implementing Actions	2 Copies
5.7.3	ALERT Implementing Actions	2 Copies
5.7.4	SITE AREA EMERGENCY Implementing Actions	4 Copies
5.7.5	GENERAL EMERGENCY Implementing Actions	4 Copies
5.7.6	Notification	10 Copies
5.7.9	Activation Of EOF	10 Copies
5.7.10	Personnel Assembly And Accountability	5 Copies
5.7.11	Evacuation Of Non-Essential Site Personnel	10 Copies
5.7.13	Personnel Monitoring And Decontamination	10 Copies
5.7.14	Stable Iodide Thyroid Blocking	4 Copies
5.7.15	Rescue And Re-Entry	3 Copies
5.7.16	Release Rate Determination	7 Copies
5.7.17	Dose Assessment	14 Copies
5.7.18	Off-Site And Site Boundary Monitoring	5 Copies
5.7.19	On-Site Radiological Monitoring	2 Copies

EMERGENCY EQUIPMENT MAINTAINED AT EOF

G. EPIPs For Emergency Use (Continued).

EPIP Number	Title	Quantity
5.7.23	Media	10 Copies
5.7.24	Medical	4 Copies

EMERGENCY EQUIPMENT MAINTAINED AT AEOF

A. General Supplies.

	Item	Quantity
1.	Coveralls, Large.	6 Each
2.	Hood, Canvas.	6 Each
3.	Shoe Covers, Latex.	12 Pairs
4.	Shoe Covers, Canvas.	12 Pairs
5.	Gloves, Surgeon's.	24 Pairs
6.	Glove Liners, White Cotton.	24 Pairs
7.	Gloves, Plastic Covered.	8 Pairs
8.	Hard Hat.	6 Each
9.	Gloves, White Cotton (Work).	12 Pairs
10.	Ion-Chamber Survey Meter (Range 0-1,000 R/Hr).	1 Each
11.	Geiger-Mueller Survey Meter (Range 0-50 mR/Hr).	1 Each
12.	Ion-Chamber (Range 0-25 R/Hr).	1 Each
13.	Sample Holder With Pancake Type Detector.	1 Each
14.	Scaler Electronic Package (MS-2 Or LCS-1).	1 Each
15.	Dosimeter, Direct Reading (1 R).	6 Each
16.	Dosimeter, Direct Reading (0-10 R).	6 Each
17.	Dosimeter, Direct Reading (0-200 mR).	2 Each
18.	Dosimeter Charger.	1 Each
19.	Batteries For Dosimeter Charger.	1 Set
20.	Portable Air Sampler (High Volume) (60 Hz, 120 V AC).	3 Each
21.	Portable Air Sampler (Low Volume).	1 Each
22.	Inverter (12 V DC To 120 V AC).	2 Each

EMERGENCY EQUIPMENT MAINTAINED AT AEOF

A. General Supplies (Continued).

Item	Quantity
23. Filters For Air Samplers:	
a. 4" For High Volume.	100 Each
b. 47 mm For Low Volume.	100 Each
24. Charcoal Filter For Air Samplers.	25 Each
25. Silver Zeolite Cartridges For Air Samplers.	25 Each
26. Extension Cord, Electric (50').	1 Each

B. Respiratory Protection Equipment*.

Item	Quantity
1. Air Breathing Masks (Self-Contained) (Complete In Case, 45 Ft^3 Tank).	2 Each
2. Full Face Filter Masks With Filters.	6 Each
3. Spare 45 Ft^3 Air Cylinders.	2 Each

*Note: The air breathing equipment is not within the Emergency Box but the cases are rack-wall-mounted near the Emergency Box for convenience, inspection, and maintenance.

C. Miscellaneous (Supplies).

Item	Quantity
1. Masking Tape, Paper, 2".	3 Rolls
2. Masking Tape, Cloth, 2".	3 Rolls
3. Plastic Sheeting, 20' x 20'.	2 Sheets
4. Plastic Bag, Small.	1 Box
5. Plastic Bag, Large.	6 Each
6. Radiation Warning Signs.	12 Each

EMERGENCY EQUIPMENT MAINTAINED AT AEOF

C. Miscellaneous (Supplies) (Continued).

	Item	Quantity
7.	File Cards, 3" x 5".	1 Package
8.	Radiation Barrier Rope, 200'.	1 Coil
9.	Smear Papers, 100s.	12 Boxes
10.	Radiation Warning Tape.	1 Roll
11.	Pad, Paper, 8 1/2" x 11".	6 Each
12.	Pad, Paper, 5" x 8".	6 Each
13.	Pencils, Lead.	6 Each
14.	Pencils, Grease Type, Red.	6 Each
15.	Stapler With Staples.	1 Each
16.	Envelopes, Manila, 3" x 5", 100s.	2 Each
17.	Clipboards.	2 Each
18.	Hand Lantern, Battery Type.	3 Each
19.	Flashlight, Battery Type.	2 Each
20.	Sets Of Batteries For Hand Lantern.	3 Sets
21.	Sets Of Batteries For Flashlights.	2 Sets
22.	Flares, Railroad Type.	6 Each
23.	Pocket Knife.	1 Each
24.	Small Hand Tool Kit With Straight Slot Screwdriver, Phillips Screwdriver, Small Pliers, And Small Vise Grip.	1 Each
25.	Scissors, Blunt Point, 6".	1 Each
26.	Shovel.	1 Each
27.	Vials, 5 ml.	12 Each

EMERGENCY EQUIPMENT MAINTAINED AT AEOF

C. Miscellaneous (Supplies) (Continued).

	Item	Quantity
28.	Pipette With Rubber Bulb.	12 Each
29.	Liter Bottle.	6 Each
30.	Step-Off Pads.	2 Each

D. Emergency Decontamination Equipment And Supplies.

	Item	Quantity
1.	55 Gallon Radwaste Barrels With Lids.	3 Each
2.	Disposable Coveralls.	50 Each
3.	Vinyl Examination Gloves, 25 Pair/Box.	2 Boxes
4.	2" Masking Tape.	3 Rolls
5.	3' x 1' x 5' Poly Bag.	12 Each
6.	8" x 10" x 24" Poly Bag.	36 Each
7.	54" x 15", 3-Ring, Vinyl Swimming Pool.	4 Each
8.	Tire Pump.	1 Each
9.	Plastic Buckets.	4 Each
10.	Bars Ivory Soap, Motel Size.	24 Each
11.	Bath Towels, Disposable.	120 Approx.
12.	Applicators, Cotton Tipped (100/Package).	2 Packages
13.	Poly Sheeting (20' x 100' x 0.006").	1 Roll
14.	Health Physics Procedure 9.1.6, Personnel Decontamination.	6 Copies
15.	Potassium Permanganate.	6 Vials
16.	Instructions For Making 4% Solution Of Potassium Permanganate.	1 Set
17.	Sodium Bisulfite.	6 Vials

EMERGENCY EQUIPMENT MAINTAINED AT AEOF

D. Emergency Decontamination Equipment And Supplies (Continued).

	Item	Quantity
18.	Titanium Dioxide.	3 Jars
19.	Alkanox.	2 Cans
20.	Tide, Detergent Soap.	1 Box
21.	Septisol (Germicide).	1 Can
22.	Lanolin.	1 Jar
23.	Swabs, Cotton Tipped, 100s.	3 Packages
24.	Compresses, Gauze, 3" x 3", 100s.	2 Packages
25.	Towels, Paper.	1 Roll
26.	Beaker, Plastic 100 ml.	3 Each
27.	Hand Brush.	10 Each
28.	Thyroid Blocking Tablets.	700 Bottles

E. First Aid And Rescue Equipment.

	Item	Quantity
1.	First Aid Kit.	1 Each

F. Additional Equipment And Reference Documents.

	Item	Quantity
1.	State Emergency Response Plans (Nebraska, Missouri, Kansas, And Iowa).	1 Each
2.	Local Emergency Response Plans (Otoe Relocation Plan, Nebraska EPZ Evacuation Study, Nemaha, Richardson, And Atchison Counties).	1 Each
3.	Emergency Plan, Complete Set Of EPIPs, And Emergency Telephone Directory.	2 Each

EMERGENCY EQUIPMENT MAINTAINED FOR AMBULANCE

A. Emergency Equipment Maintained For Ambulance.

	Item	Quantity
1.	Dosimeter, Direct Reading (0-200 mR).	10 Each
2.	Dosimeter Charger.	2 Each
3.	TLD Badge.	10 Each
4.	Geiger-Mueller Survey Meter.	1 Each
5.	Ion-Chamber Survey Instrument.	1 Each
6.	Radiation Tags.	10 Each
7.	Plastic Sheeting.	1 Roll
8.	Dosimeter Log Sheets.	3 Each
9.	Smear Supplies.	1 Box
10.	Health Physics Procedure 9.6.2, Portable Beta-Gamma Counting Instrument.	1 Copy
11.	Scaler Electronic Package (MS-2) With Pancake Type Detector And Sample Holder.	1 Each
12.	High Band Frequency 2-Way Radio.	1 Each
13.	Form CNS-HP25, TLD Badging Record.	1 Each

EMERGENCY EQUIPMENT MAINTAINED AT HOSPITAL

A. Emergency Equipment Maintained At Hospital.

	Item	Quantity
1.	Radiation Barrier Rope.	1 Roll
2.	Masking Tape.	10 Rolls
3.	Absorbent Paper.	1 Roll
4.	Plastic Sheeting.	1 Roll
5.	Waste Container (Liquid And Solid).	1 Each
6.	Applicable Radiation Warning Signs.	5 Each
7.	Shoe Covers, Plastic.	60 Pairs
8.	Shoe Covers, Cloth.	15 Pairs
9.	Bags, Plastic (Large).	10 Each
10.	Bags, Plastic (Small).	20 Each
11.	Radiation Marking Tape.	2 Rolls
12.	Coveralls (Anti-C).	2 Pairs
13.	EPIP 5.7.24, Medical.	5 Copies
14.	Gloves, Rubber Disposable.	2 Boxes
15.	Cardboard Boxes, 2' x 3'.	6 Each
16.	Masolin Rags.	100 Each

EMERGENCY VEHICLES MAINTAINED AT CNS

A. Emergency Vehicles Maintained At CNS.

Item	Quantity
1. Window Van (4WD), Suburban With High Band Radio For Emergency/Environmental Use Only.	1
2. Pickup Truck (4WD), 3/4 Ton With High Band Radio.	1
3. Pickup Truck (2WD), 3/4 Ton.	1
4. Ambulance (2WD), Chevy Van 20 With Medical Configuration High Band Radio For Medical Use Only.	1
5. Automobile, Sedan* With High Band Radio.	5

*Vehicles normally driven by Station Superintendent and Department Supervisors.

I. PURPOSE

To effectively respond to an emergency the CNS technical staff must remain isolated from peripheral duties that may distract from mitigating the emergency and restoring the station to safe and stable conditions. It is recognized, however, that accurate and timely information must be made available to the various state, local, and federal agencies, the general public, and the news media. To facilitate this goal additional NPPD personnel will report to the Emergency Operations Facility (EOF) and act as the liaison between CNS technical personnel and NPPD public information personnel located in the General Office Emergency Center (GOEC) and Media Release Center (MRC). This procedure identifies how information regarding station status will be developed and transmitted to the GOEC and MRC.

II. DISCUSSION

A. The policies regarding public information to be transmitted to the GOEC and MRC (and ultimately to the general public) are described below and will serve to guide NPPD during any emergency at CNS:

1. The District has established a policy of full disclosure and will maintain a free, open relationship with the public, with public officials, and with the communities near CNS and with its employees.

2. The District will provide the public with accurate, prompt, and candid information pertaining to the emergency. This information will be either written or spoken and will be disseminated through established news and information channels.

3. The District will communicate with the public via newspaper, radio, television, and written correspondence, with the news media by means of written materials, briefings, telecasts, radio broadcasts, conferences, and telephone, and with its employees by means of telephone and/or intra-district publications.

B. Depending upon the emergency situation it may become necessary to develop and release general information regarding the status of station prior to arrival of additional NPPD personnel at the EOF and NPPD Public Information Officers at the MRC. If this occurs, the release of information to the media will be made at the discretion of the Manager, Public Affairs Division, after making contact with the Emergency Director (or his designated representative) and the GOEC staff.

C. This procedure is implemented by NPPD personnel at the following off-site emergency response facilities:

1. General Office Emergency Center (GOEC).

2. Media Release Center (MRC).

3. Emergency Operations Facility (EOF).

D. Information describing the procedures to be followed and activities to be conducted at the GOEC and MRC are presented in General Office Guideline 5.4.

III. REFERENCE MATERIAL

A. CNS Emergency Plan.

B. NUREG 0654, Revision 1.

C. NUREG 0696.

D. General Office Guideline 5.3.

E. General Office Guideline 5.4.

IV. PREREQUISITES

A. An ALERT, SITE AREA EMERGENCY, or GENERAL EMERGENCY has been declared in accordance with EPIP 5.7.1, Emergency Classification.

B. Either EPIP 5.7.2, EPIP 5.7.3, EPIP 5.7.4, or EPIP 5.7.5 and EPIP 5.7.6 has been implemented.

V. LIMITATIONS

A. None.

VI. PRECAUTIONS

A. Accuracy in developing and releasing information regarding an emergency at CNS is extremely important. Always verify information with other sources before any releases are made to the GOEC, the MRC, the media, or the public.

B. Accuracy in receiving information regarding an emergency at CNS is extremely important. Ensure that the information is recorded concisely and that the reporting official repeats the information and gives his name.

VII. EQUIPMENT

A. None.

VIII. PROCEDURE

A. Media.

1. Immediate actions.

a. Upon initial declaration of and ALERT or higher emergency classification the Information Manager (IM) and the Technical Information Coordinator (TIC) will proceed to the EOF in accordance with General Office Guideline 5.1.

b. The Chief Public Information Officer (PIO), acting under the direction of the Senior Division Manager of Power Operations in the GOEC will ensure that:

1) Information related to the emergency situation is received from the Emergency Director or his representative and recorded on Attachment "A".

2) Information flow to the media as outlined in Attachment "B" is established.

c. The NRC will be activated in accordance with General Office Guideline 5.3, Activation Of MRC.

2. Subsequent actions.

a. Once the Information Manager and Technical Information Coordinator arrive at the EOF they will:

1) Establish contact with the GOEC and MRC.

2) Review the EOF Status Boards (Plant and Radiological) and discuss the situation with appropriate members of the CNS Emergency Response Organization.

b. The Technical Information Coordinator in conjunction with the Information Manager will gather information regarding the emergency and complete a Media Release Information Form (Attachment "C").

c. The Technical Information Coordinator will review the Media Release Information Form with the Operations Advisor for completeness and accuracy.

d. The Technical Information Coordinator will provide it to the Information Manager for transmission to the GOEC and MRC.

e. The Information Manager and Technical Information Coordinator will ensure information is properly coordinated and released on a continuing basis until the Emergency Director has determined that the emergency has been mitigated and recovery operations will commence.

f. During recovery operations, acting under the Recovery Director, the Information Manager and Technical Information Coordinator will continue to provide information to the media via the GOEC and/or the MRC.

IX. ATTACHMENTS

A. Attachment "A", Public Information Emergency Information Log.

B. Attachment "B", Media Release Information Form.

C. Attachment "C", Information Flow For Media Release.

PUBLIC INFORMATION
EMERGENCY INFORMATION LOG

Depending upon the circumstances this form may be used in whole or in part, as a record of emergency information received.

Date: _____ Time: _____ Number: _____

THIS IS/IS NOT AN EXERCISE

Name Of Individual Providing Information: _____

1. Date And Time Of Emergency: _____

2. Type Of Emergency (Describe Briefly): _____

_____

_____

Classification (Circle One): Unusual Event - Alert Condition - Site Area Emergency - General Emergency

THIS IS/IS NOT AN EXERCISE

3. Plant Status At Present Time: _____

_____

_____

4. Will The General Public Be Affected? (Describe Briefly): _____

_____

_____

5. Other Comments: _____

_____

_____

_____

Name Of Individual Receiving Information: _____

MEDIA RELEASE INFORMATION FORM

Release Number: _____

ROUTING: _____

PRIORITY:
___ URGENT
___ ROUTINE
___ DISCRETIONARY

CLEARANCES:
___ EOF PIO ___ DATE: _____
___ GOEC PIO ___ TIME: _____

INFORMATION SOURCE(S): _____

INFORMATION: _____

MEDIA RELEASE INFORMATION FORM

STATION STATUS REPORT

INFORMATION SOURCE:

RELEASE NUMBER: _____ TIME: _____ A.M./P.M. PAGE ___ OF ___

NAME: _____ POSITION: _____

STATION STATUS IS: _____

ACTIONS BEING TAKEN: _____

REPORT DEVELOPED BY: _____

DISTRIBUTION:

COEC: ____ MRC: ____ EOC: ____ EOF: _ _

MEDIA RELEASE INFORMATION FORM

EMERGENCY RESPONSE STATUS REPORT

INFORMATION SOURCE:

RELEASE NUMBER: _____ TIME: _____ A.M./P.M. PAGE ____ OF ____

NAME: _____ POSITION: _____

AGENCY: _____

RESPONSE ACTIONS INITIATED: _____

_____

_____

_____

_____

_____

_____

RESPONSE ACTIONS COMPLETED: _____

_____

_____

_____

_____

_____

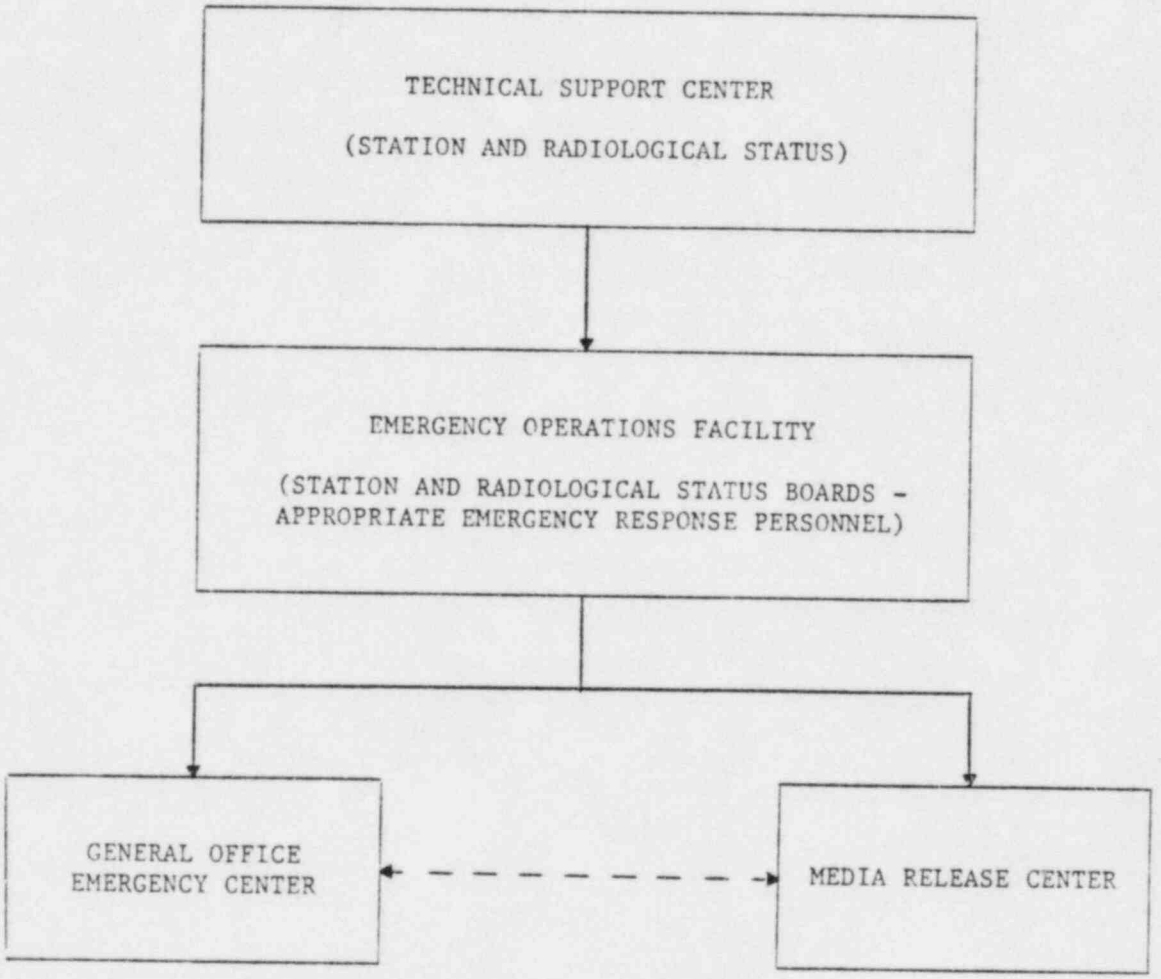
_____

REPORT DEVELOPED BY: _____

DISTRIBUTION:

GOEC: ____ MRC: ____ EOC: ____ EOF: ____

INFORMATION FLOW FOR MEDIA RELEASE



———— Primary Flow (Status Of Emergency)

- - - - - - Flow As Required By Situation (Policy Decisions)

( ) Information Sources

I. PURPOSE

The purpose of this procedure is to describe the Early Warning System within the Emergency Planning Zone (EPZ) of Cooper Nuclear Station. This system was set up to meet prompt notification requirements for Cooper Nuclear Station. It was also designed for response to any disaster; fire, flood, tornado, etc., where prompt notification of the public is desirable.

II. DISCUSSION

The Early Warning System consists of fixed sirens covering areas of high population density and tone activated Emergency Broadcast System (EBS) radios in the low population density rural areas.

The fixed siren system is composed of ten pole mounted sirens located in or near the following towns:

A. Nebraska:

1. Peru - one siren in town.
2. Brownville - one siren in town.
3. Nemaha - one siren in town.
4. Shubert - one siren in town.

B. Missouri:

1. Watson - one siren near town.
2. Rock Port - one siren in town.
3. Phelps City - one siren in town.
4. Langdon - one siren near town.
5. Nishnabotna - one siren near town.
6. Intersection of US-136 and I-29 - one siren near this intersection.

These fixed sirens are Federal Signal Corporation Thunderbolt sirens capable of producing 125 db of sound in any of three sound patterns.

The EBS tone activated radios are in residences located within the rural EPZ areas outside the hearing range of the fixed sirens. These radios are pretuned to the Primary Emergency Broadcast Stations , kHz Omaha, within the Nebraska EPZ and . . kHz St. Joseph, within the Missouri EPZ) and are automatically activated when the EBS station sounds the EBS tones. These radios also have battery backup power.

In addition to the primary means of notification, fixed sirens and tone activated radios, a backup system consisting of vehicle mounted mobile siren units is available. This Mobile Siren System is comprised of mobile units following designated routes. Mobile sirens have been provided to each volunteer fire department within these areas to cover the number of routes specified below.

A. Nebraska:

1. Peru - four routes.

2. Brownville - four routes.

3. Nemaha - four routes.

4. Shubert - two routes.

B. Missouri:

1. Rock Port - seven routes.

2. Watson - four routes.

In addition, the Richardson and Nemaha County Sheriff's personnel also have designated notification routes.

See Attachment "D" for maps of the designated routes.

The mobile sirens are Whelen Engineering Company Model 370 PA speakers coupled to a Whelen WS-295 power amplifier. These sirens are capable of producing four distinct sounds at a sound level exceeding 70 db.

III. REFERENCE MATERIAL

A. CNS Emergency Plan.

B. NUREG 0654, Revision 1.

C. CNS Emergency Planning Information Booklet.

IV. PREREQUISITES

A. Prompt notification to the public is deemed necessary for implementation of protective action guides. This will normally be determined by state and local authorities in accordance with their respective Nuclear Power Plant Emergency Response Plans. The CNS Emergency Director will recommend protective actions to these authorities in accordance with EPIP 5.7.20, Protective Action Guides, or in severe situations, may activate the Early Warning System in accordance with EPIP 5.7.6, Notification.

V. LIMITATIONS

A. The Early Warning System, in addition to its use as a means of prompt notification in the event of an incident at Cooper Nuclear Station requiring a protective action, may be used to warn the public of attack, tornado, flood, fire, or any disaster requiring prompt notification of the public.

VI. PRECAUTIONS

A. The Early Warning System to be used only in the event of emergencies or scheduled testing.

VII. EQUIPMENT

A. Ten fixed sirens located in the following population centers:

1. Nebraska:

a. Peru - one siren in town.

b. Brownville - one siren in town.

c. Nemaha - one siren in town.

d. Shubert - one siren in town.

2. Missouri:

a. Rock Port - one siren in town.

b. Watson - one siren near town.

c. Phelps City - one siren in town.

d. Langdon - one siren near town.

e. Nishnabotna - one siren near town.

f. Intersection of US-136 and I-29 - one siren near this intersection.

B. Tone activated Emergency Broadcast System radios located in rural residences within the Emergency Planning Zone.

C. Backup mobile sirens are in the following locations. The number of operable mobile sirens at each location shall meet or exceed the number of mobile siren routes assigned to each location. Spare mobile sirens may be maintained at each location.

1. Nebraska:

a. Peru - four routes with three mobile units mounted on fire trucks and one universal mount mobile siren unit within the Fire House.

b. Brownville - four routes with three mobile units mounted on fire trucks and one universal mount mobile siren unit within the Fire House.

c. Nemaha - four routes with one mobile unit on a fire truck and three universal mount mobile siren units within the Fire House.

d. Shubert - two routes with two mobile units within the Fire House.

e. Indian Cave State Park - one mobile unit mounted on Park Ranger vehicle.

f. Nemaha County Sheriff - two routes with two mobile units mounted on Sheriff's Department vehicles.

g. Richardson County Sheriff - one route with one mobile unit mounted on Sheriff's Department vehicle.

2. Missouri:

a. Rock Port - seven routes with four universal mount mobile siren units stored within the Fire House and three units installed on fire vehicles.

b. Watson - four routes with one universal mount mobile siren unit within the Fire House and three units installed on fire vehicles.

D. Communications equipment installed for the backup mobile siren system includes base and mobile two-way radio units to the respective County Sheriff Departments for the following, if equipment did not already exist before installation of the EWS:

1. Nebraska:

a. Peru - one base and one mobile.

b. Brownville - one base and one mobile.

c. Nemaha - one base and one mobile.

d. Indian Cave State Park - one base and two mobile units.

e. Shubert - one unlisted telephone in the Fire House.

2. Missouri:

a. Rock Port - Firemen have their own encoder system.

b. Watson - one base and one mobile.

VIII. PROCEDURE

A. Fixed Sirens.

1. Activation.

a. Activation of the fixed sirens will be accomplished by the County Sheriff in the county which the siren is located:

1) Nemaha County Sheriff activates the fixed sirens in Peru, Brownville, and Nemaha (Nemaha County Sheriff has the capability to also activate the Shubert fixed siren).

2) Richardson County Sheriff activates the fixed siren in Shubert.

3) Atchison County Sheriff activates the fixed sirens in Rock Port, Watson, Phelps City, Nishnabotna, Langdon, and US-136 and I-29 intersection.

b. The Sheriffs will be requested to sound the fixed sirens in their respective areas by the local and/or state emergency response authorities. These authorities will have responded to a Cooper Nuclear Station emergency in accordance with their respective state and local emergency response plans. In a severe situation, the Sheriffs may be requested to sound the sirens by the CNS Emergency Director if immediate protective action is deemed necessary. The CNS Emergency Director will then contact the appropriate Emergency Broadcast System (EBS) station(s) to activate the EBS. To activate the EBS the Emergency Director must telephone , and provide an authentication code to the station(s) in order that radio station personnel may be assured the Emergency Director's call is legitimate. The authentication codes are located in the glass case in the Shift Supervisor's Office in the Control Room. The glass must be broken to obtain the code. Once the authenticity of the call is established, the Emergency Director will deliver the appropriate preformatted message to the EBS station(s) in accordance with EPIP 5.7.6, Notification. The stations will then activate their EBS equipment and transmit the warning message.

2. Testing by an actual activation of the fixed sirens will be accomplished in accordance with the following schedule:

   a. Nemaha County - third Saturday of each month.

   b. Richardson County - fourth Friday of each month.

   c. Atchison County - first Saturday of each month.

3. Maintenance or repair.

   a. If repair of the fixed sirens is required, the Cooper Nuclear Station Control Room personnel will be notified and will initiate necessary repair action, logging, and notification.

      Note: See Attachments "A", "B", and "C" for Sheriff's procedure to activate the fixed sirens.

B. EBS Tone Activated Radios.

1. Activation.

   a. Activation of the EBS radios are accomplished by the primary EBS transmitter stations; kHz Omaha for Nebraska EPZ, and kHz St. Joseph for Missouri EPZ. When these stations activate their emergency broadcast, a dual tone is sounded which turns on the EBS tone activated radio receivers and then the emergency message is broadcast. The EBS tone activated receivers stay on, continuing with the EBS station's program format until reset to automatic.

   b. The primary Emergency Broadcast station will be requested to broadcast an EBS message by local or state emergency response authorities. These authorities will have responded to a Cooper Nuclear Station emergency in accordance with their respective state and local emergency response plans. In a severe situation, the stations may be requested to broadcast an EBS message by the CNS Emergency Director if immediate protective action is deemed necessary. To activate the Emergency Broadcast System (EBS) the Emergency Director must telephone KFAB and/or KFEQ and provide an authentication code to the station(s) in order that radio station personnel may be assured the Emergency Director's call is legitimate. The authentication codes are located in the glass case in the Shift Supervisor's Office in the Control Room. The glass must be broken to obtain the code. Once the anthenticity of the call is established, the Emergency Director will deliver the appropriate preformatted message to the EBS station(s) in accordance with EPIP 5.7.6, Notification. The stations will then activate their EBS equipment and transmit the warning message.

2. Testing.

a. Once per week the primary EBS stations test their EBS system which activates the tone activated radios and proceeds with the message. In the event of an actual emergency appropriate information would be broadcast at this time. Thus, individuals with EBS tone activated radios will have their radios automatically tested once per week. A test button is provided on each radio to check the radio by bypassing the automatic activation function to verify operability. In addition, the EBS activated radios have a battery test button and indicator light to check the battery backup power source.

3. Maintenance or repair.

a. Should the EBS activated radio fail any of the above tests, malfunction, or need maintenance or repair, a telephone number is posted on the radio for the individual to call to initiate corrective actions. See Attachment "N" for description of material attached to the radio. Reporting and correction of tone activated radio malfunctions shall be conducted as specified in EPIP 5.7.27.1, EBS Tone Activated Radio Malfunctions.

C. Backup Mobile Sirens.

1. Activation.

a. The backup mobile siren system may be utilized at the decision of local or state emergency authorities on a contingent basis to augment the fixed sirens and EBS tone activated radios. In a severe situation, this system may also be activated by the Emergency Director.

b. Upon the decision to activate the backup mobile siren system, Volunteer Firemen will be called to their respective Fire Houses by the sounding of their local fire siren. The County Sheriff may activate this siren by radio encoder or he may contact the local Fire Chief who will activate the siren himself.

c. The Fire Chief or Senior Firemen will contact the County Sheriff by radio or telephone and request information. If the backup mobile siren system is to be activated, Firemen will place the mobile siren units on vehicles (if not already installed), perform an operational check, and drive the routes as outlined in Attachment "D". Each Fire House has a procedure outlining these steps. Attachments "E" through "L" contain these procedures. Upon completion of the notification routes, the Fire Chief or Senior Firemen will report back to the County Sheriff.

Note: Nemaha County and Richardson County Sheriff personnel also have routes as shown in Attachment "C" and route procedure Attachments "K" and "L".

2. Testing.

   a. Mobile sirens at the Fire Houses will normally be tested during the scheduled Fire Department meetings. Testing and operability of the sirens will be verified during regularly scheduled Quality Assurance audits.

3. Maintenance or repair.

   a. Responsibility for maintenance and repair of mobile sirens rests with Cooper Nuclear Station. If a mobile siren is found to be inoperable or in need of repair, the Cooper Nuclear Station Control Room personnel (. should be notified. The Emergency Planning Coordinator will be informed and will initiate necessary repair actions.

IX. ATTACHMENTS

A. Nemaha County Sheriff - Activation Of Early Warning System.

B. Richardson County Sheriff - Activation Of Early Warning System.

C. Atchison County Sheriff - Activation Of Early Warning System.

D. D-1 - Peru Notification Routes.

   D-2 - Brownville Notification Routes.

   D-3 - Nemaha Notification Routes.

   D-4 - Shubert Notification Routes.

   D-5 - Nemaha County Sheriff Notification Routes.

   D-6 - Richardson County Sheriff Notification Routes.

   D-7 - Rock Port Notification Routes.

   D-8 - Watson Notification Routes.

E. Peru Volunteer Fire Department - Mobile Siren Procedure.

F. Brownville Volunteer Fire Department - Mobile Siren Procedure.

G. Nemaha Volunteer Fire Department - Mobile Siren Procedure.

H. Shubert Volunteer Fire Department - Mobile Siren Procedure.

I. Rock Port Volunteer Fire Department - Mobile Siren Procedure.

J. Watson Volunteer Fire Department - Mobile Siren Procedure.

K. Nemaha County Sheriff - Mobile Siren Procedure.

L. Richardson County Sheriff - Mobile Siren Procedure.

M. Indian Cave State Park - Mobile Siren Procedure.

N. EBS Tone Activated Radio Operating Instructions.

NEMAHA COUNTRY SHERIFF - ACTIVATION OF EARLY WARNING SYSTEM

In the event of an emergency at Cooper Nuclear Station or any civil disaster which may require immediate alerting of people from the towns of Brownville, Peru, Shubert, and Nemaha, the following procedure will be utilized:

1. Sound the alert tone for sirens in the designated areas (use code near controls to alert individual sirens or all sirens sounded at once). Sound the sirens for several three-minute cycles.

   Note: The Shubert siren may also be sounded from Richardson County Sheriff's Office.

2. The sounding of these sirens alerts residents in these communities to tune to the Emergency Broadcast Station, kHz, for emergency information. Rural residences within the Emergency Planning Zone will be alerted with EBS tone activated radios when the EBS message is broadcast.

3. Contact the Indian Cave Park Ranger by radio or telephone and request him to alert visitors.

4. If activation of the backup mobile siren system is deemed necessary:

   a. Establish communications with the local Fire Chief in the siren area by telephone or radio (Peru - radio, Brownville - radio, Nemaha - Fire Chief radio or telephone).

   b. The Fire Chief will dispatch the Firemen with mobile sirens on predesignated routes. These mobile sirens have public address systems and will be used to alert residents along their routes to tune to the Emergency Broadcast Station.

   c. Dispatch two Sheriff's Officers to cover the Nemaha County Sheriff's mobile siren routes.

   d. The Fire Chief is to report back when the routes have been completed.

   e. Once notified by the respective Fire Chief and Sheriff's personnel that all Early Warning routes have been completed, the Nemaha County Sheriff will relay this information to the Nemaha County Emergency Operations Center.

Testing: Activate the fixed sirens in Brownville, Peru, and Nemaha at 1000 on the third Saturday of each month. Activate each siren for 15 to 20 seconds and then cancel. Contact each community to verify the sirens were sounded. Log this activation and verification of sounding in the Dispatcher's Log Book. If a siren is found to be inoperable, contact Cooper Nuclear Station during normal working hours or . during off hours or weekends) and inform the Emergency Planning Coordinator or the Shift Supervisor of the malfunction.

RICHARDSON COUNTY SHERIFF - ACTIVATION OF EARLY WARNING SYSTEM

In the event of an emergency at Cooper Nuclear Station or any civil disaster which may require immediate alerting of people from the town of Shubert, the following procedure will be utilized:

1. Sound the alert tone for the siren in Shubert (use code near controls to alert siren). Sound the siren for several three-minute cycles.

   Note: The Shubert siren may also be sounded from the Nemaha County Sheriff's Office.

2. The sounding of this siren alerts residents in these community to tune to the Emergency Broadcast System radio station, kHz, for emergency information. Rural residences within the Emergency Planning Zone will be alerted with EBS tone activated radios when the EBS message is broadcast.

3. If activation of the Backup Mobile Siren System is deemed necessary:

   a. Establish communications with the local Fire Chief in the siren area by telephone (unlisted Fire House telephone number is .

   b. The Fire Chief will dispatch the Firemen with mobile sirens on pre-designated routes. These mobile sirens have public address systems which will be used to alert residents along their routes to tune to the Emergency Broadcast Station.

   c. Dispatch Officer to cover Richardson County Sheriff's mobile siren route.

   d. The Fire Chief is to report back when the routes have been completed.

   e. Once notified by the Fire Chief and sheriff's personnel that all Early Warning routes have been completed, the Richardson County Sheriff will relay this information to the Richardson County Emergency Operations Center.

Testing: Activate the fixed sirens in Shubert at 1630 on the fourth Friday of each month. Activate the siren for 15 to 20 seconds and then cancel. Contact Shubert to verify the siren was sounded. Log this activation and verification of sounding in the Dispatcher's Log Book. If the siren is found to be inoperable, contact Cooper Nuclear Station during normal working hours or during off hours or weekends) and inform the Emergency Planning Coordinator or the Shift Supervisor of the malfunction.

ATCHISON COUNTY SHERIFF - ACTIVATION OF EARLY WARNING SYSTEM

In the event of an emergency at Cooper Nuclear Station or any civil disaster which may require immediate alerting of people from the towns of Rock Port, Watson, Phelps City, Langdon, Nishnabotna, and siren at the US-136 and I-29 intersection, the following procedure will be utilized:

1. Sound the alert tone for sirens in the designated areas (use code near controls to alert individual sirens or all sirens at once). Sound the sirens for several three-minute cycles.

2. The sounding of these sirens alerts residents in these communities to tune to the Emergency Broadcast System radio station, . kHz, for emergency information. Rural residences within the Emergency Planning Zone will be alerted with EBS tone activated radios when the EBS message is broadcast.

3. If activation of the Backup Mobile Siren System is deemed necessary:

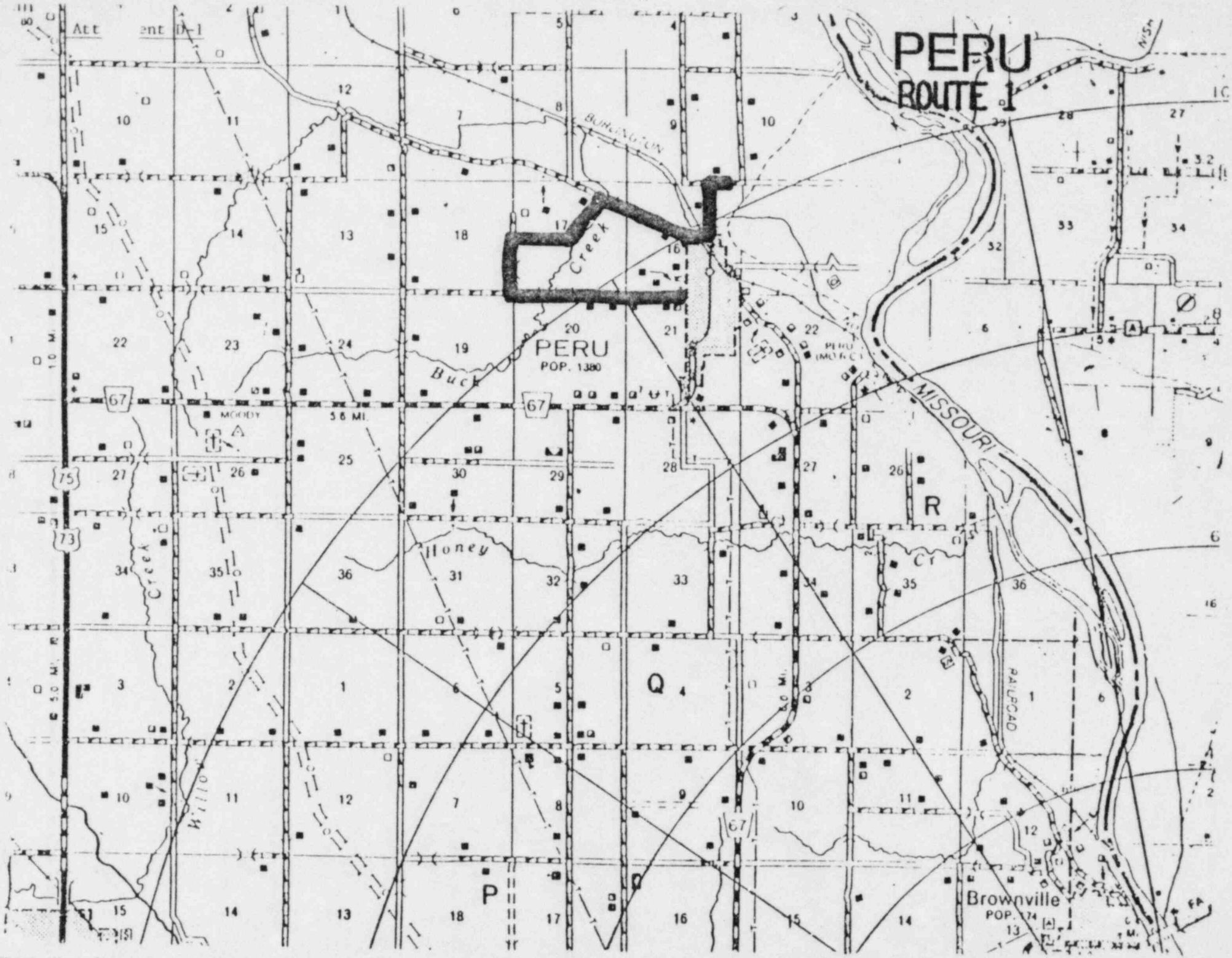
   a. Establish communication with the Rock Port and Watson Fire Departments in the siren area by telephone or radio. Watson has a base radio.

   b. The Fire Chief will dispatch the Firemen with mobile sirens in predesignated routes. These mobile sirens have public address systems which will be used to alert residents along their routes to tune to the Emergency Broadcast Station.

   c. The Fire Chief is to report back when the routes have been completed.

   d. Once notified by the respective Fire Chief and Sheriff's personnel that all Early Warning routes have been completed, the Atchison County Sheriff will relay this information to the Atchison County Emergency Operations Center.

Testing: Activate the fixed sirens in Rock Port, Watson, Phelps City, Langdon, Nishnabotna, and the siren located at US-136 and I-29 intersection at 1200 the first Saturday of each month. Activate each siren for 15-20 seconds and then cancel. Contact each community to verify the sirens were sounded. Log this activation and verification of sounding in the Dispatcher's Log Book. If a siren is found to be inoperable, contact Cooper Nuclear Station during normal working hours or during off hours or weekends) and inform the Maintenance Supervisor or the Emergency Planning Coordinator of the malfunction.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MISSOURI
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Brownville
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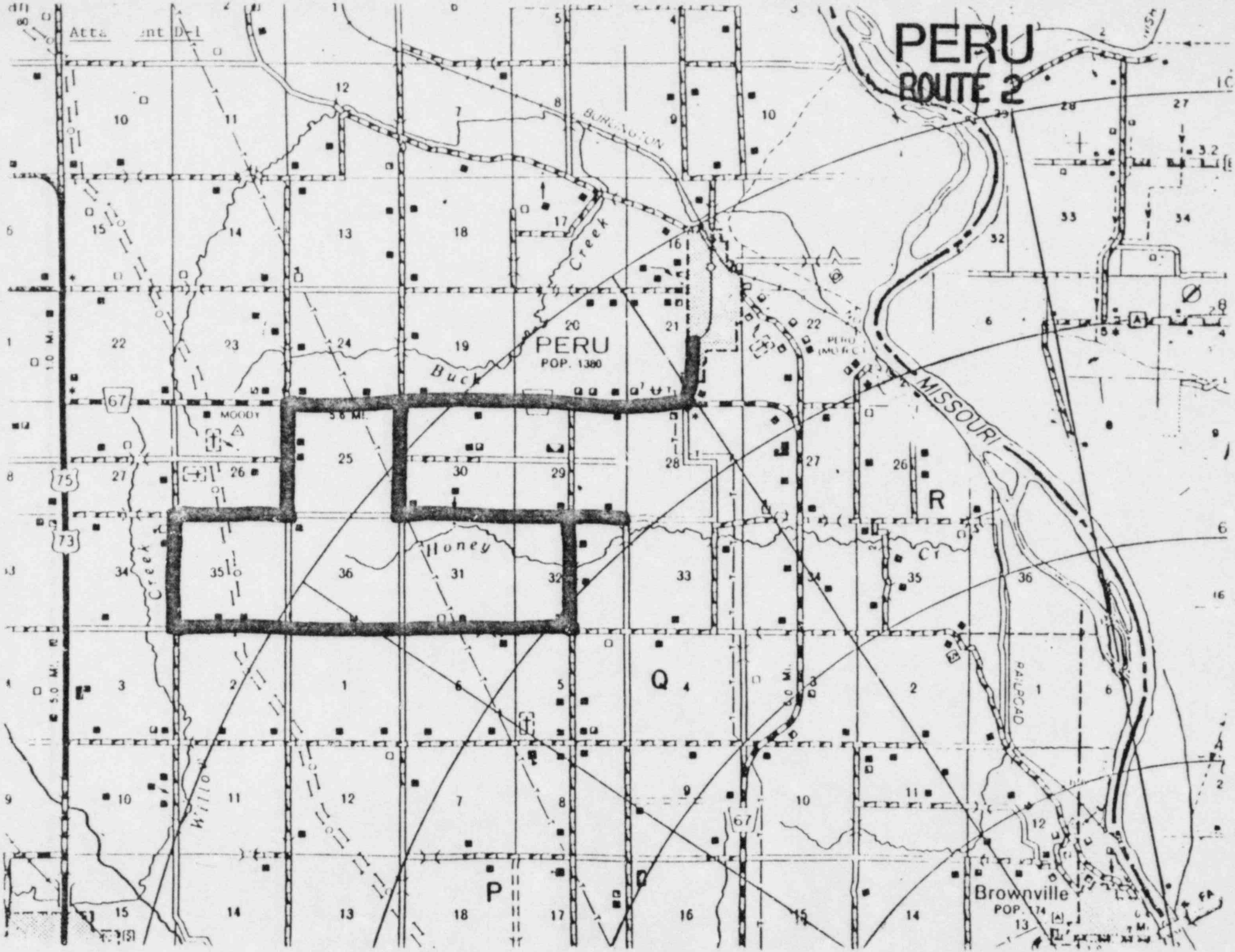
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ROUTE 2
PERU
POP. 1380
MISSOURI
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Honey Creek
Willow Creek
MOODY
Brownville
POP. 174
RAILROAD
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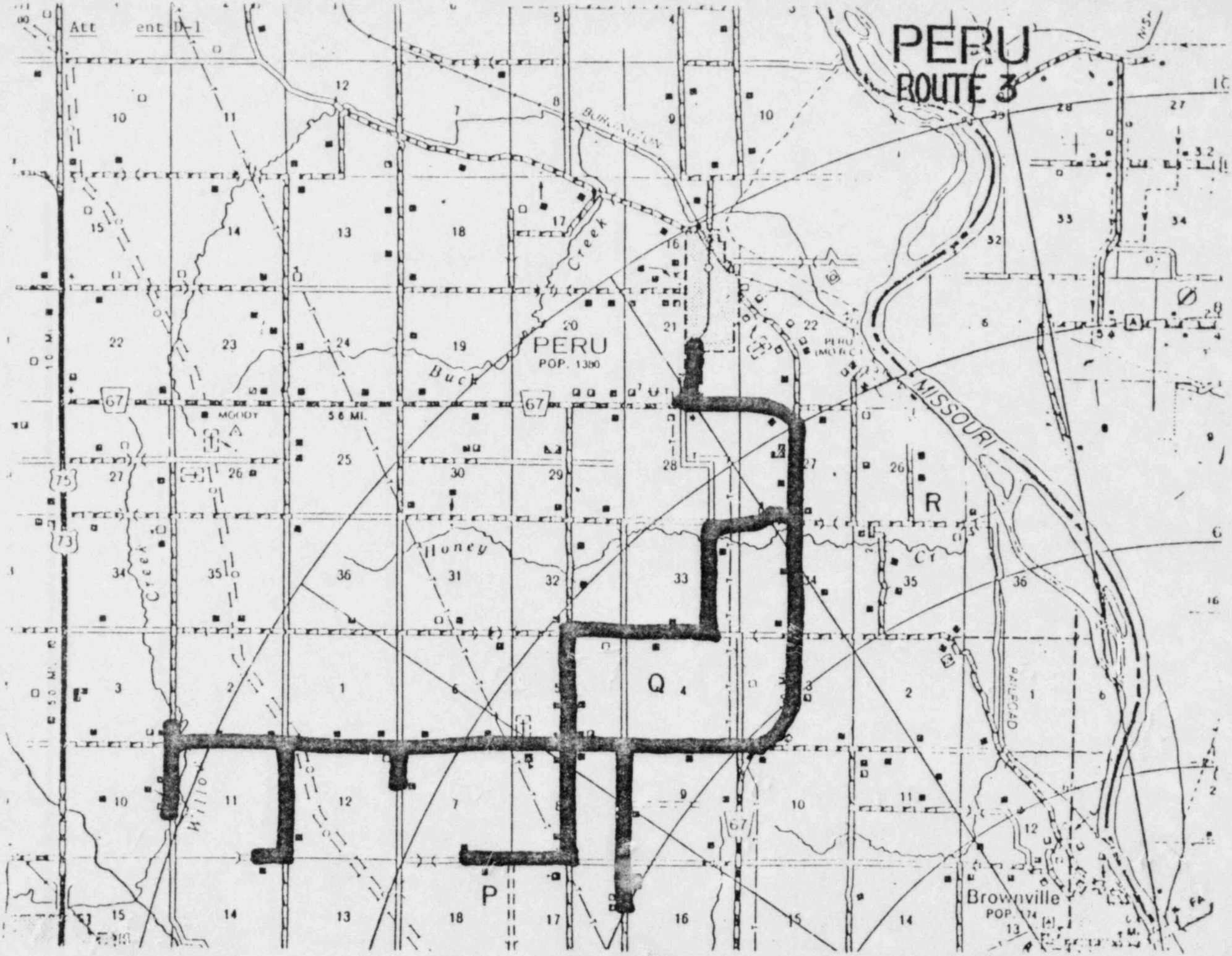
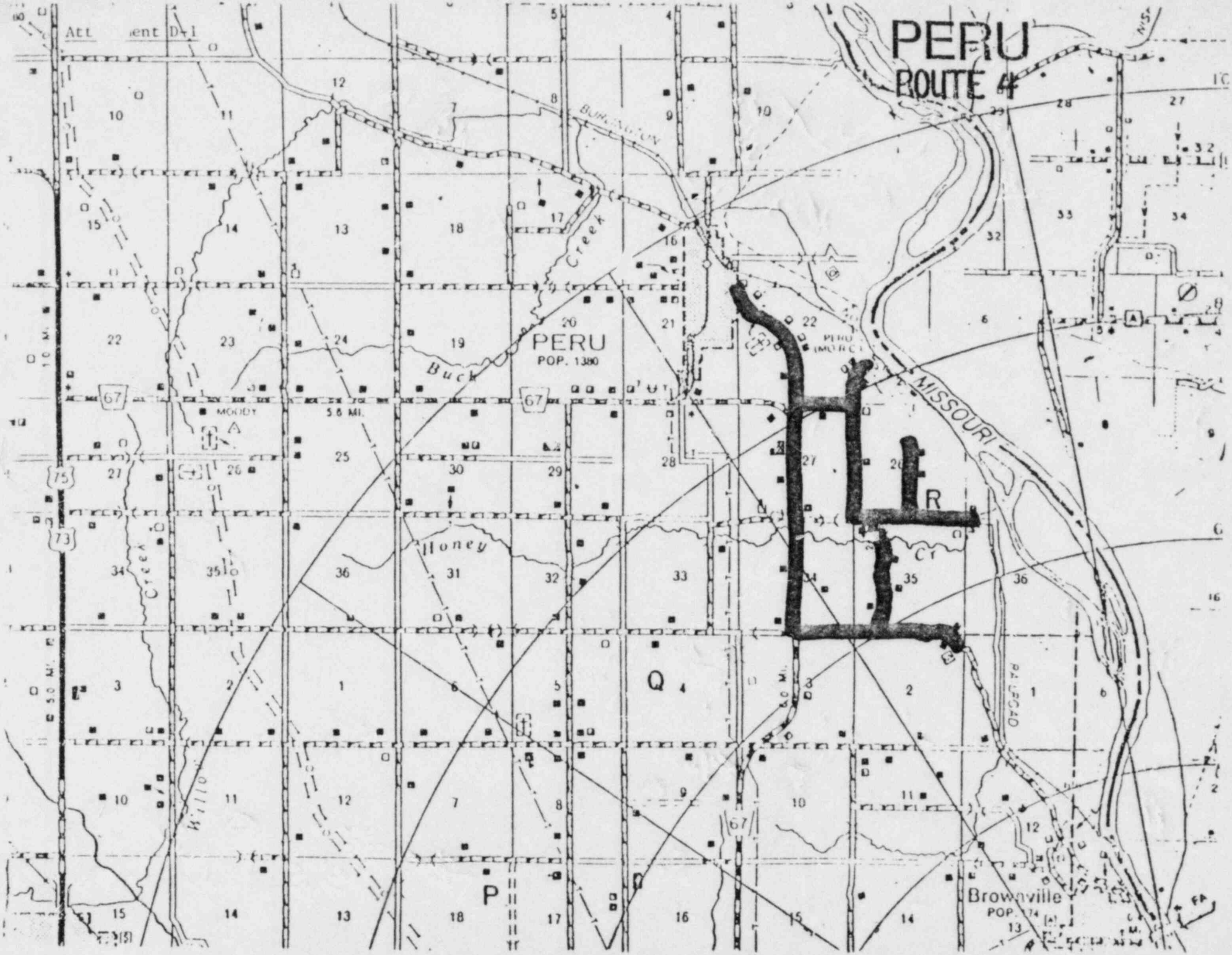
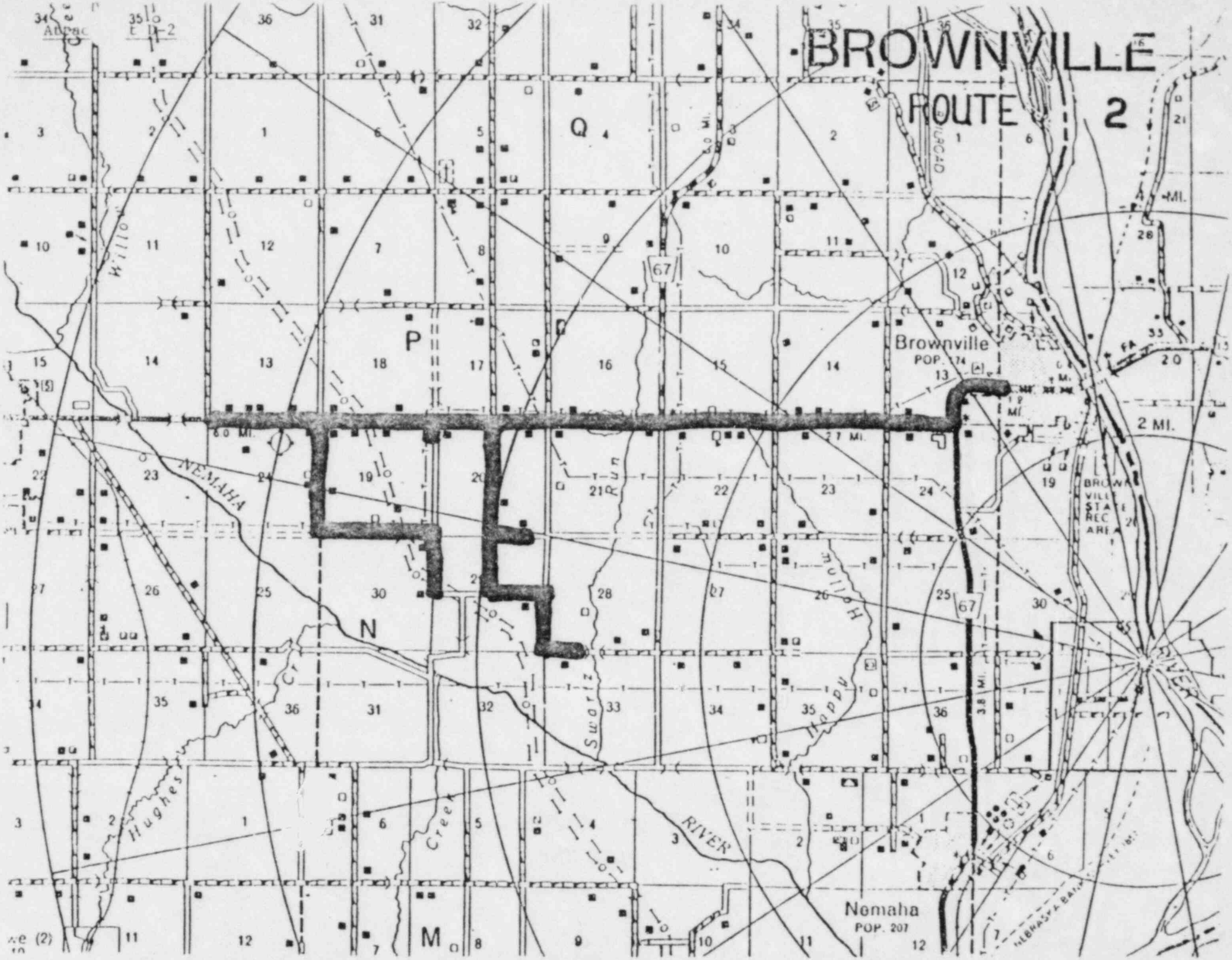
Attachment D-1



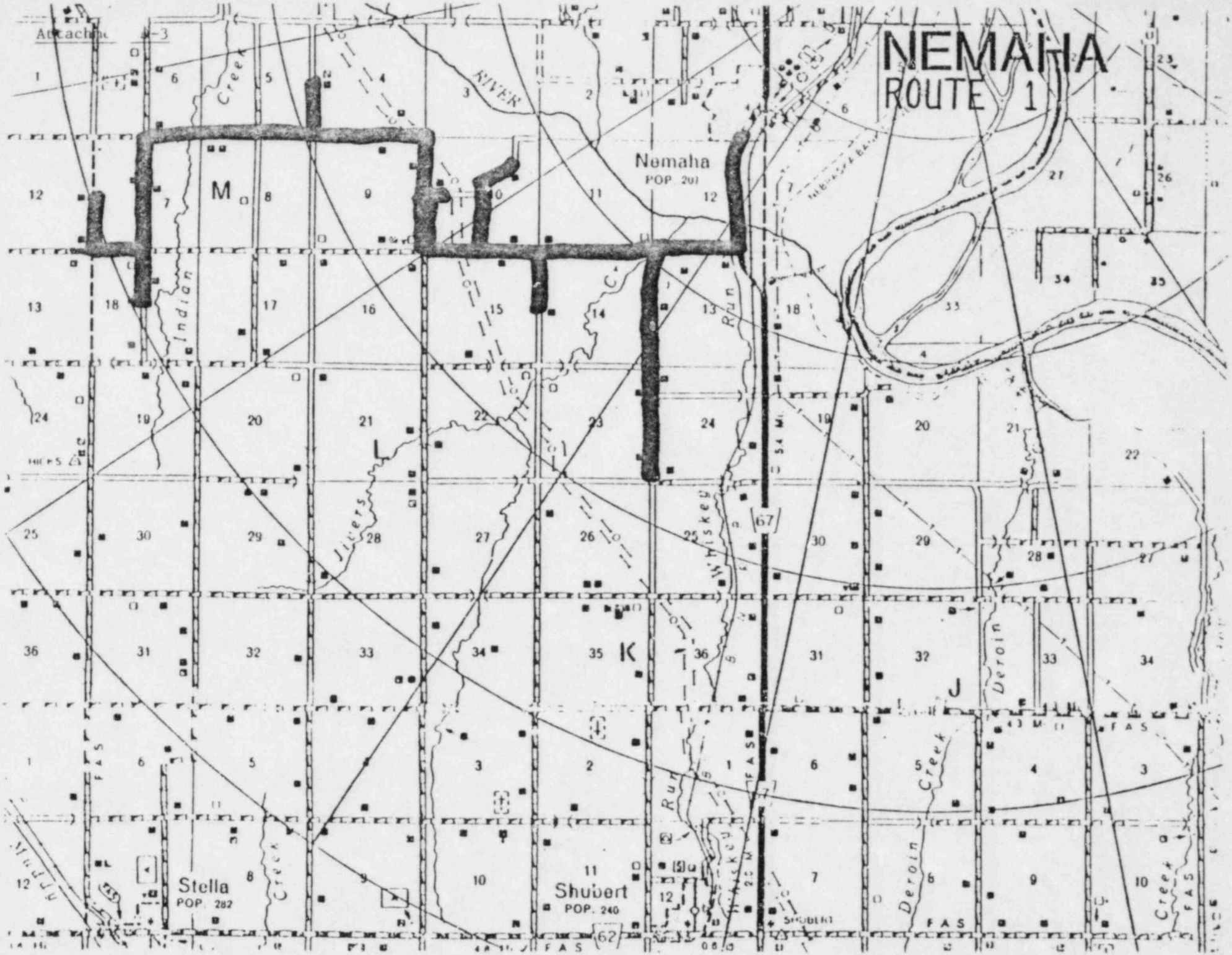

Att ent D-1
PERU
ROUTE 4
PERU
POP. 1380
MOODY
5.6 MI.
Buck Creek
Honey Creek
Creek
MISSOURI
R
Q
P
Browneville
POP. 74
BURLINGTON


BROWNVILLE
ROUTE 1
Brownville
POP. 174
Nemaha
POP. 207
NEMAHA
RIVER
Hughes Creek
Swartz Creek
Happy Hollow
Willow Creek
BUCKEYE
NEBRASKA BAND
BROWNVILLE STATE REC AREA
136
67
6.0 MI.
2.1 MI.
3.8 MI.
2 MI.
P
Q
N
M


BROWNVILLE
ROUTE 2
Brownville
POP. 174
Nemaha
POP. 207
67
2 MI.
NEMAHA
Hughes
Creek
RIVER
Swartz
Happy
Hollow
Willow
Q
P
N
M


BROWNVILLE
ROUTE 3
Brownville
POP. 174
Nemaha
POP. 207
2 MI.
6.0 MI.
NEMAHA
RIVER
Hughes
Creek
Swartz
Happy
Hollow
BROWNVILLE STATE REC AREA
67
136

Attachment 1-2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ROUTE 1
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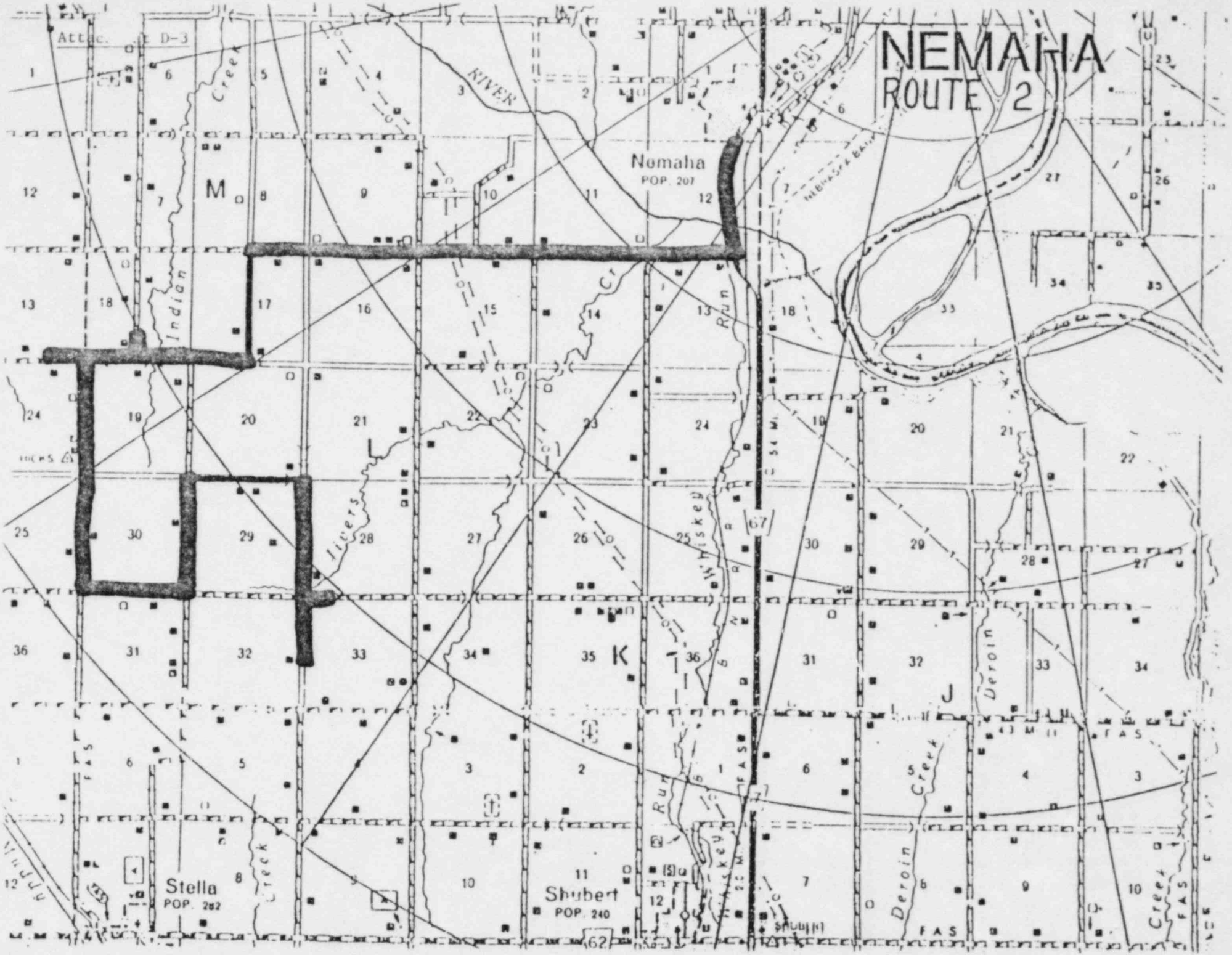
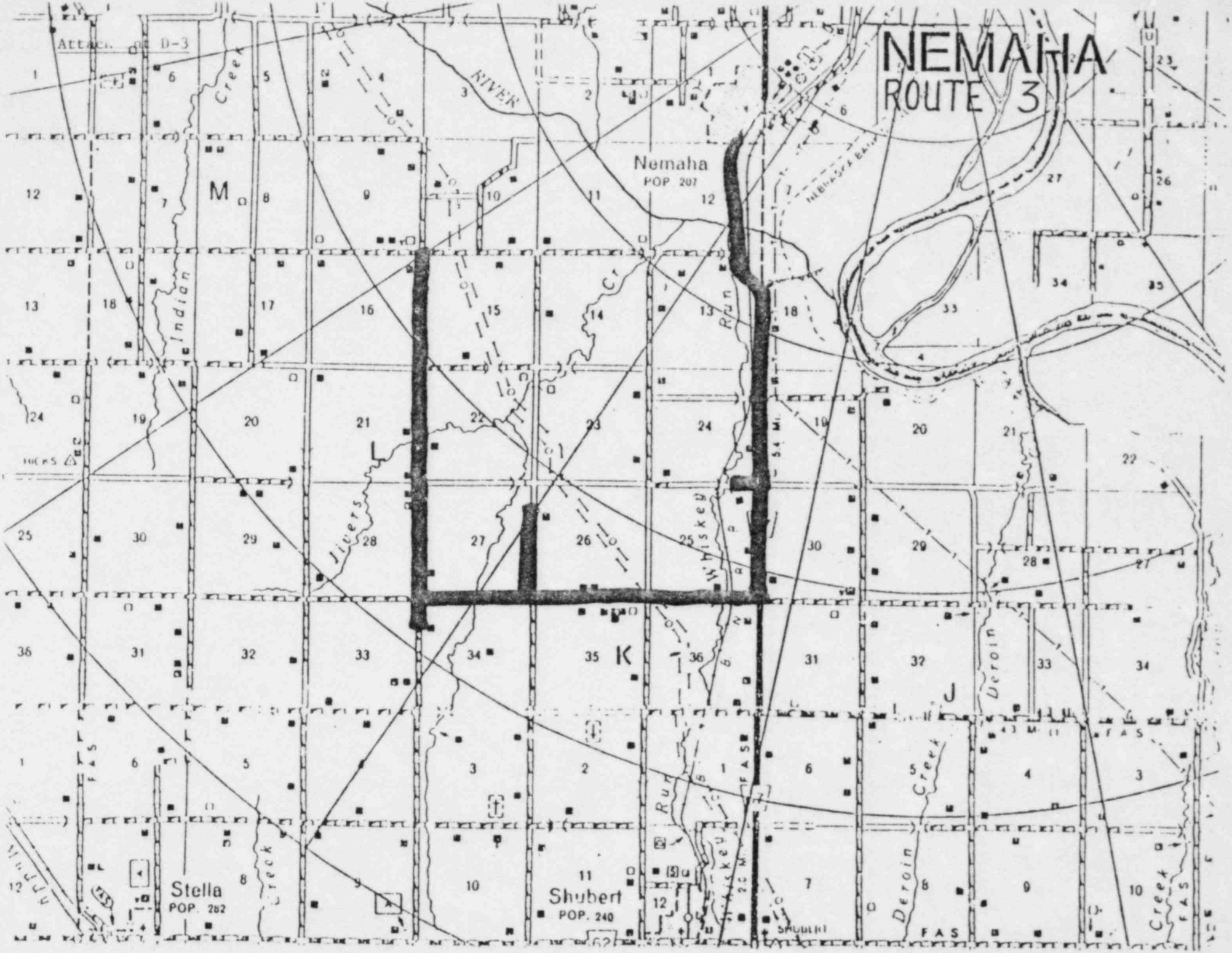
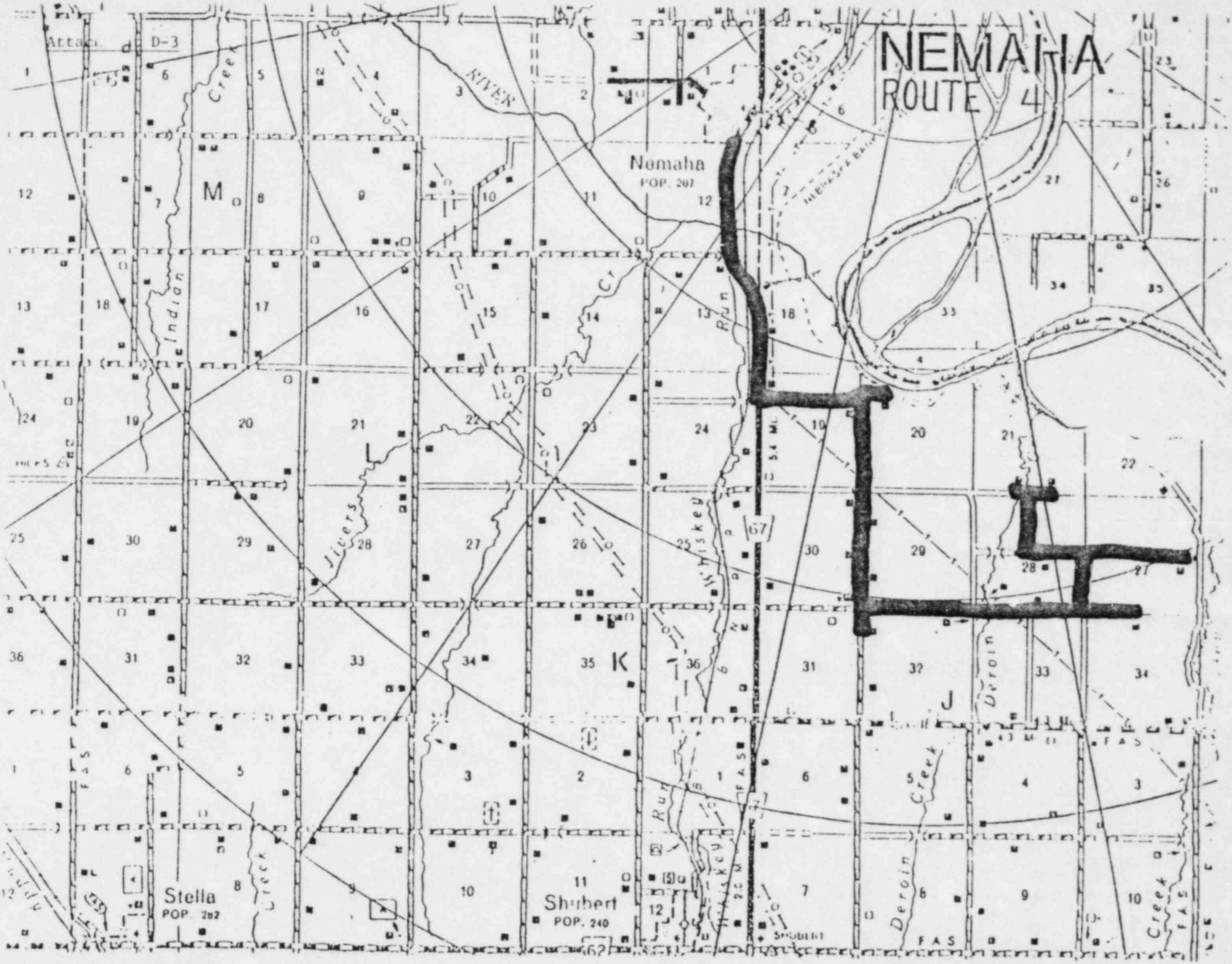
POP. 201
Stella
POP. 282
Shubert
POP. 240
Indian Creek
Juers Creek
Deroin Creek
Whiskey Run
67
62


NEMAHA
ROUTE 2
Attac. D-3
Nemaha
POP. 207
Stella
POP. 282
Shubert
POP. 240
Indian Creek
Deroin Creek
Whiskey Run
Ivers
M
L
K
J
67
62
FAS


Attach. D-3
NEMAHA
ROUTE 3
Nemaha
POP. 207
Stella
POP. 282
Shubert
POP. 240
Indian Creek
Whiskey Run
Derain Creek
FAS
M
L
K
J


NEMAHA
ROUTE 4
Nemaha
POP. 207
Stella
POP. 252
Shubert
POP. 240
Attach. D-3
Indian Creek
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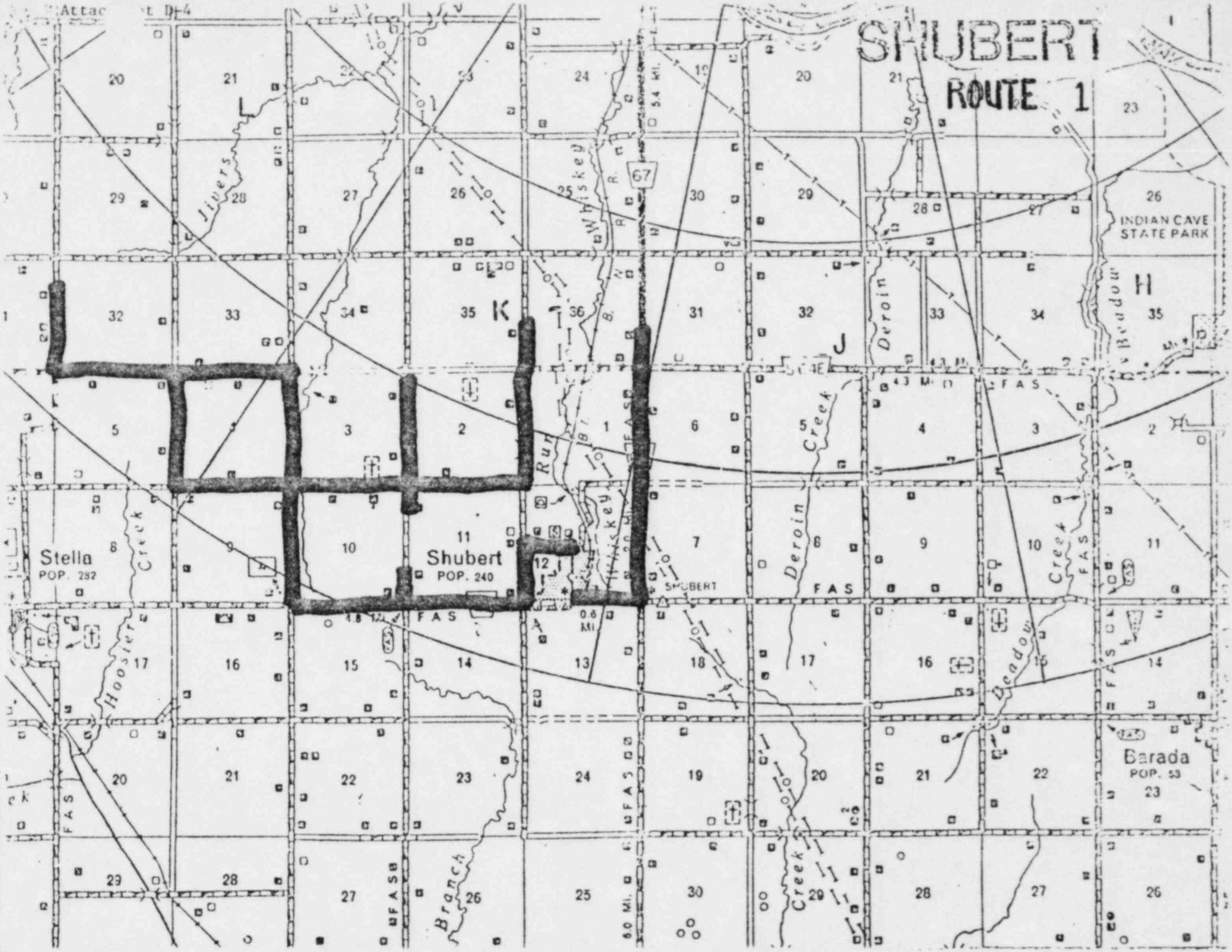
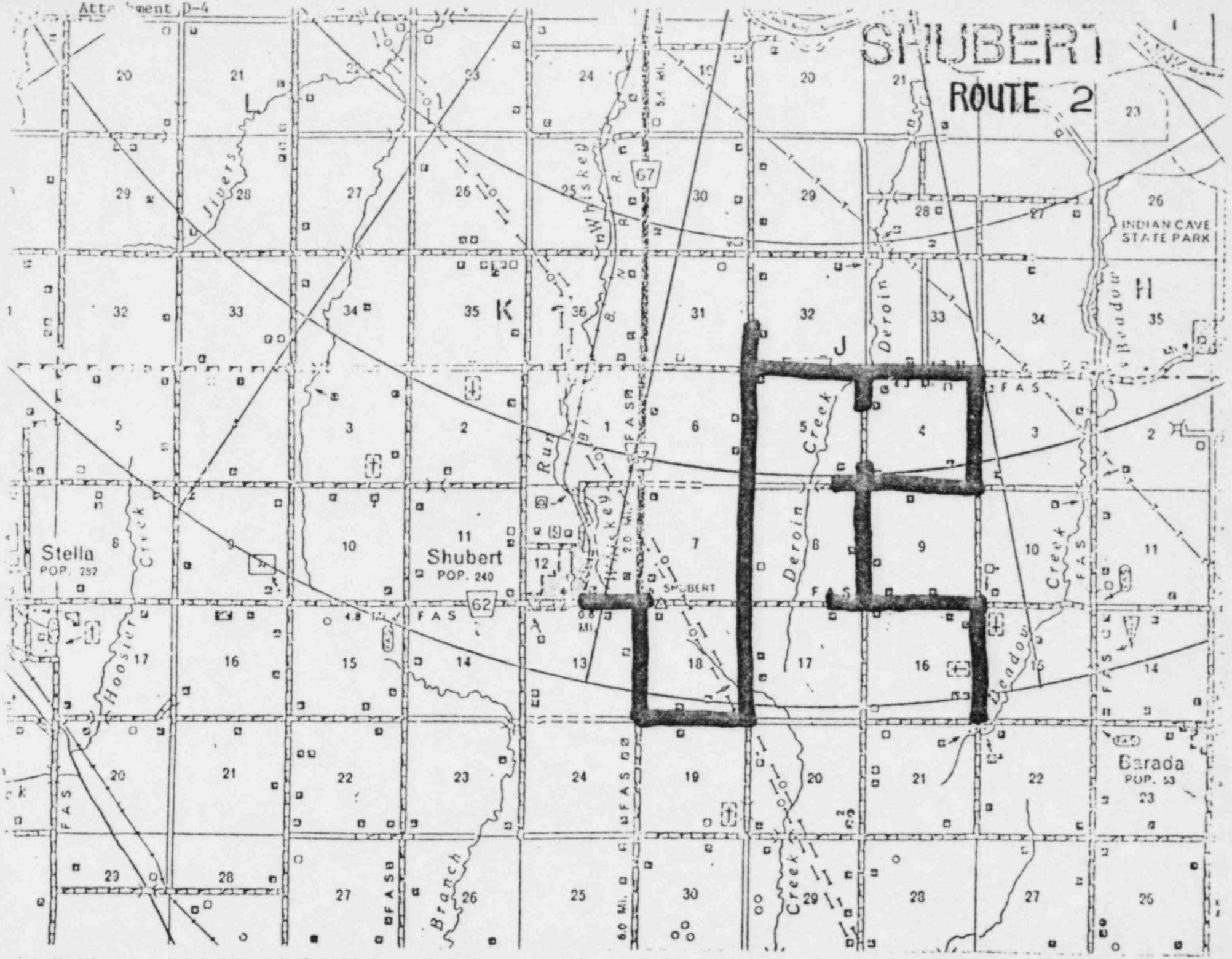
Whiskey Run
Deroin Creek
M
L
K
J
67
FAS


SHUBERT
ROUTE 1
Stella
POP. 282
Shubert
POP. 240
Barada
POP. 53
INDIAN CAVE
STATE PARK
Whiskey
Deroin
Hoosier
Creek
Meadow
Branch
FAS
67

Attachment D-4



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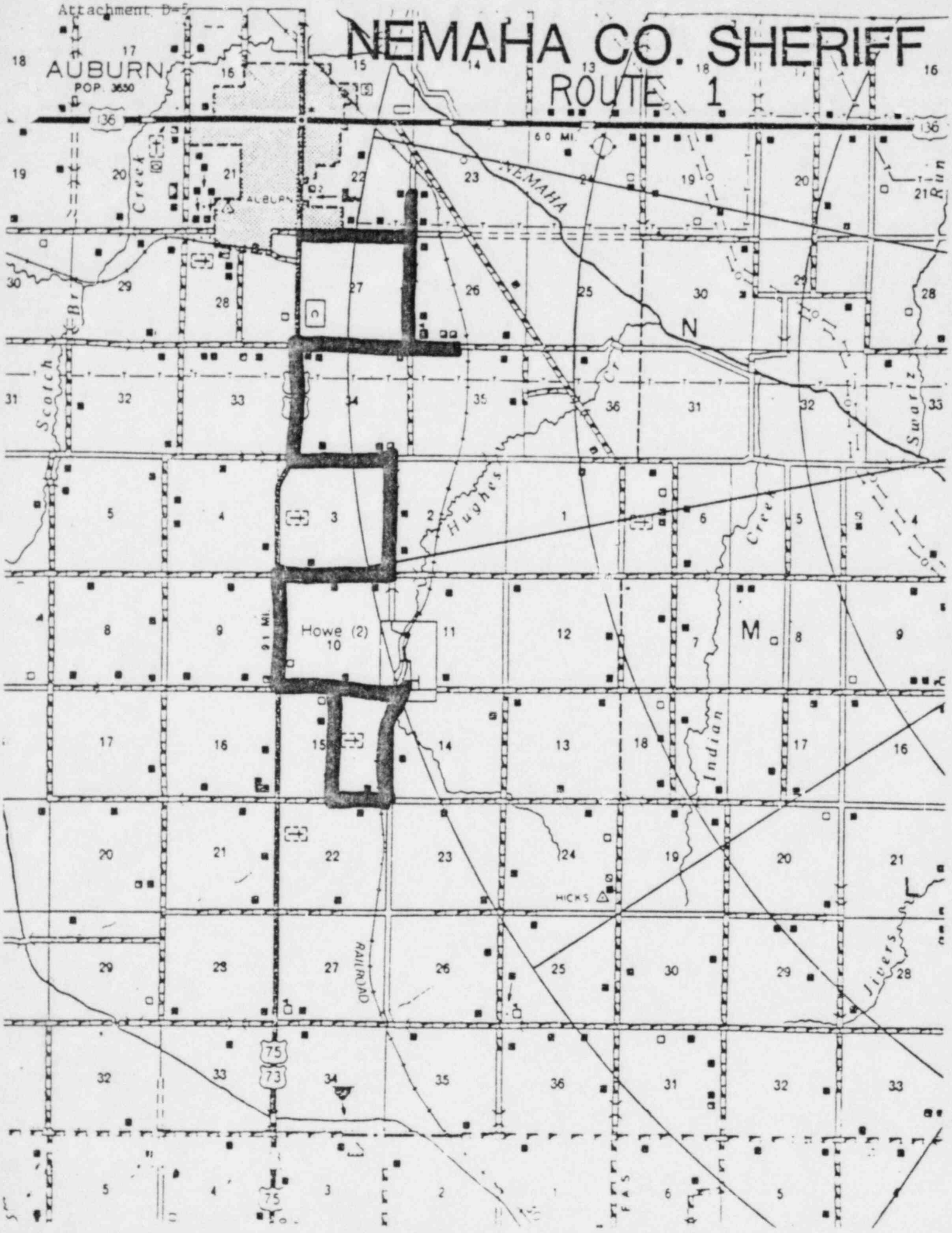

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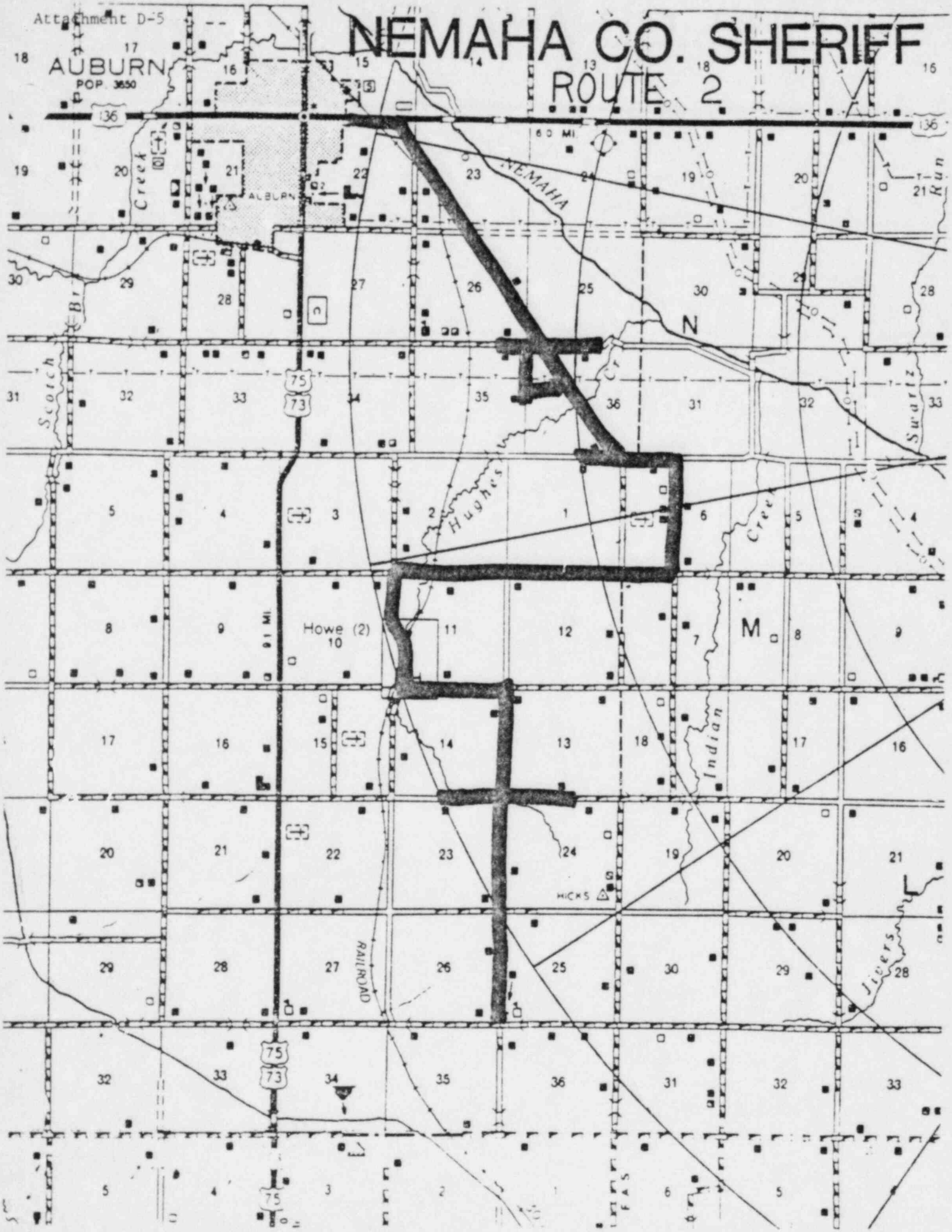
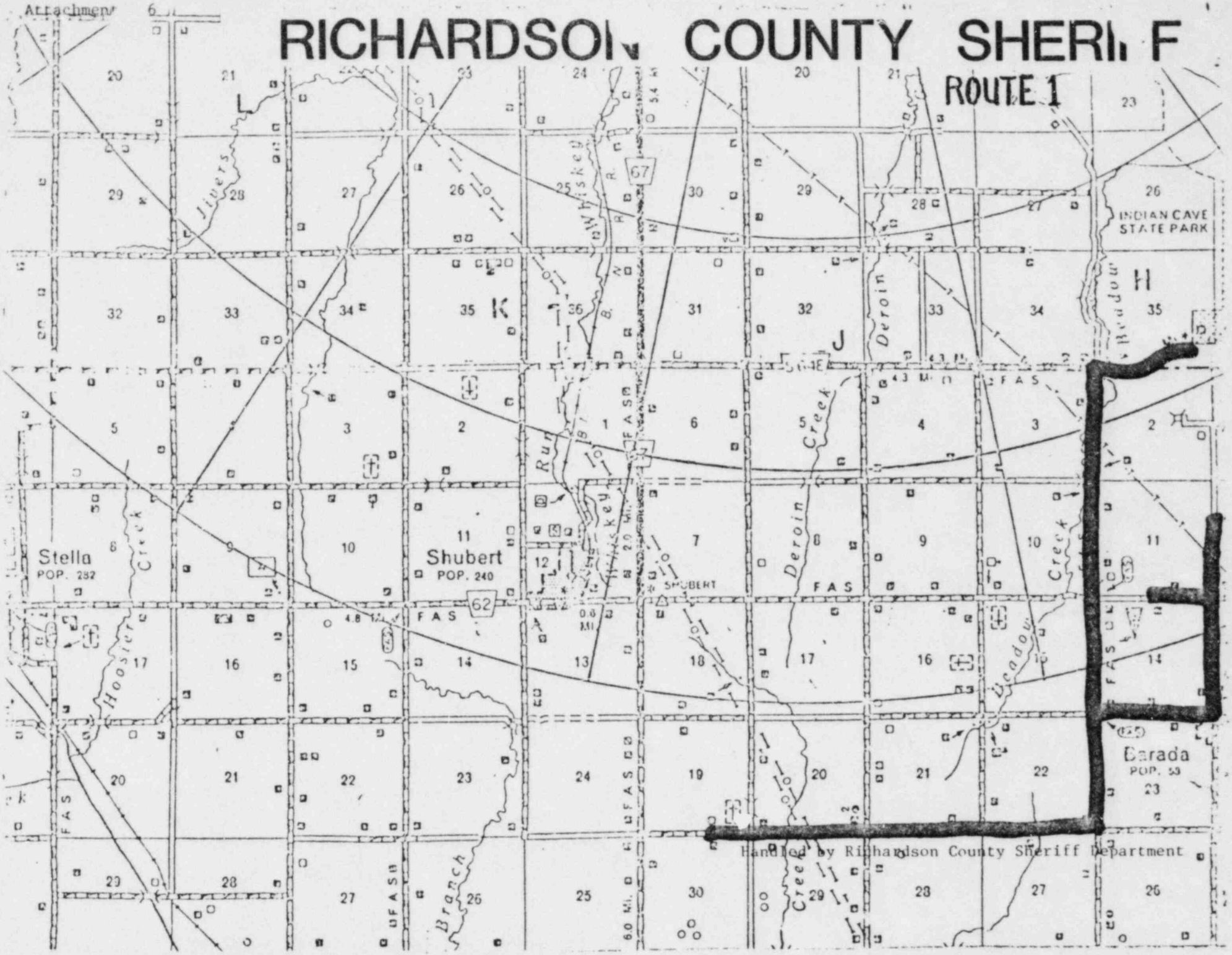
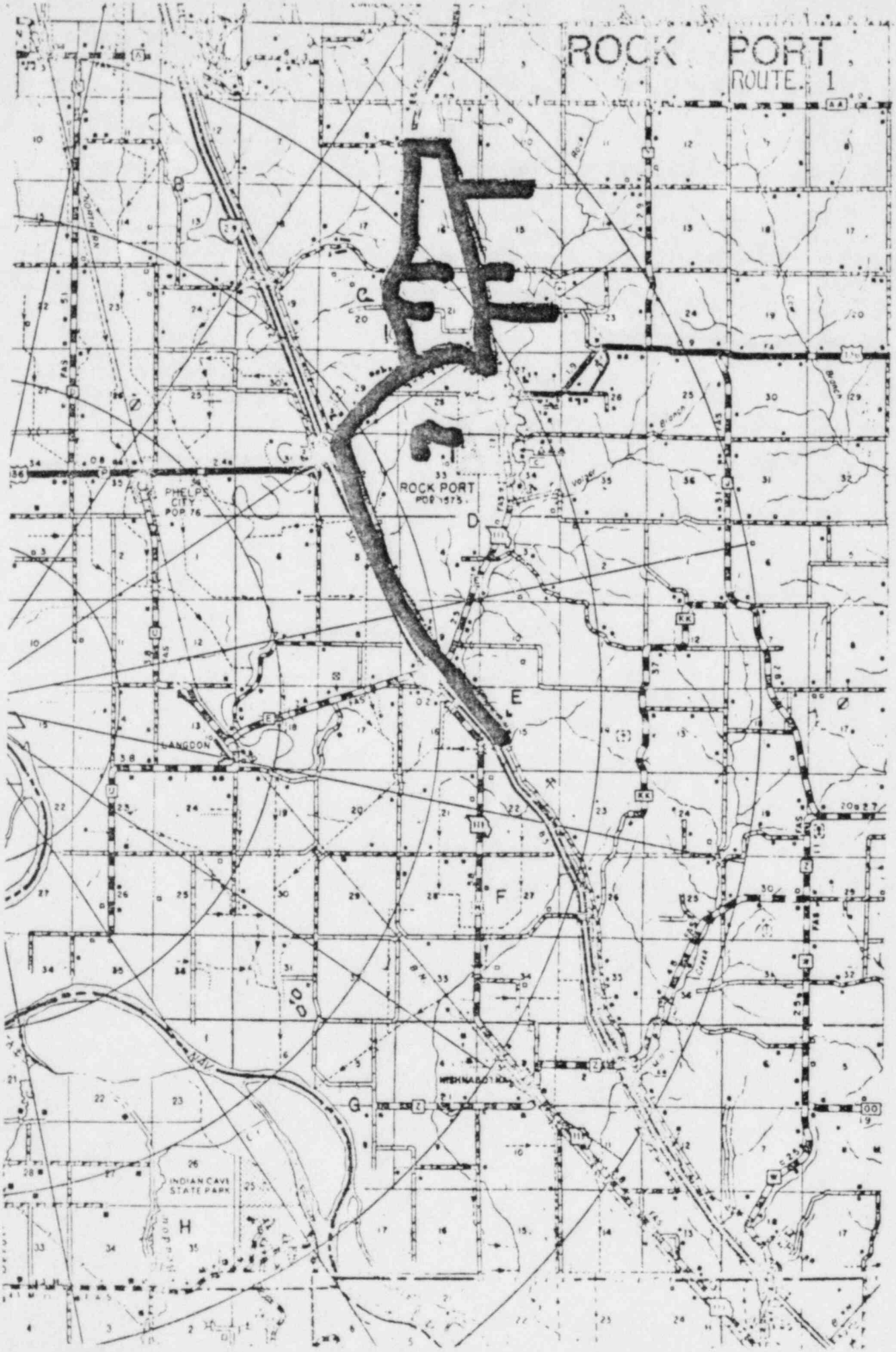


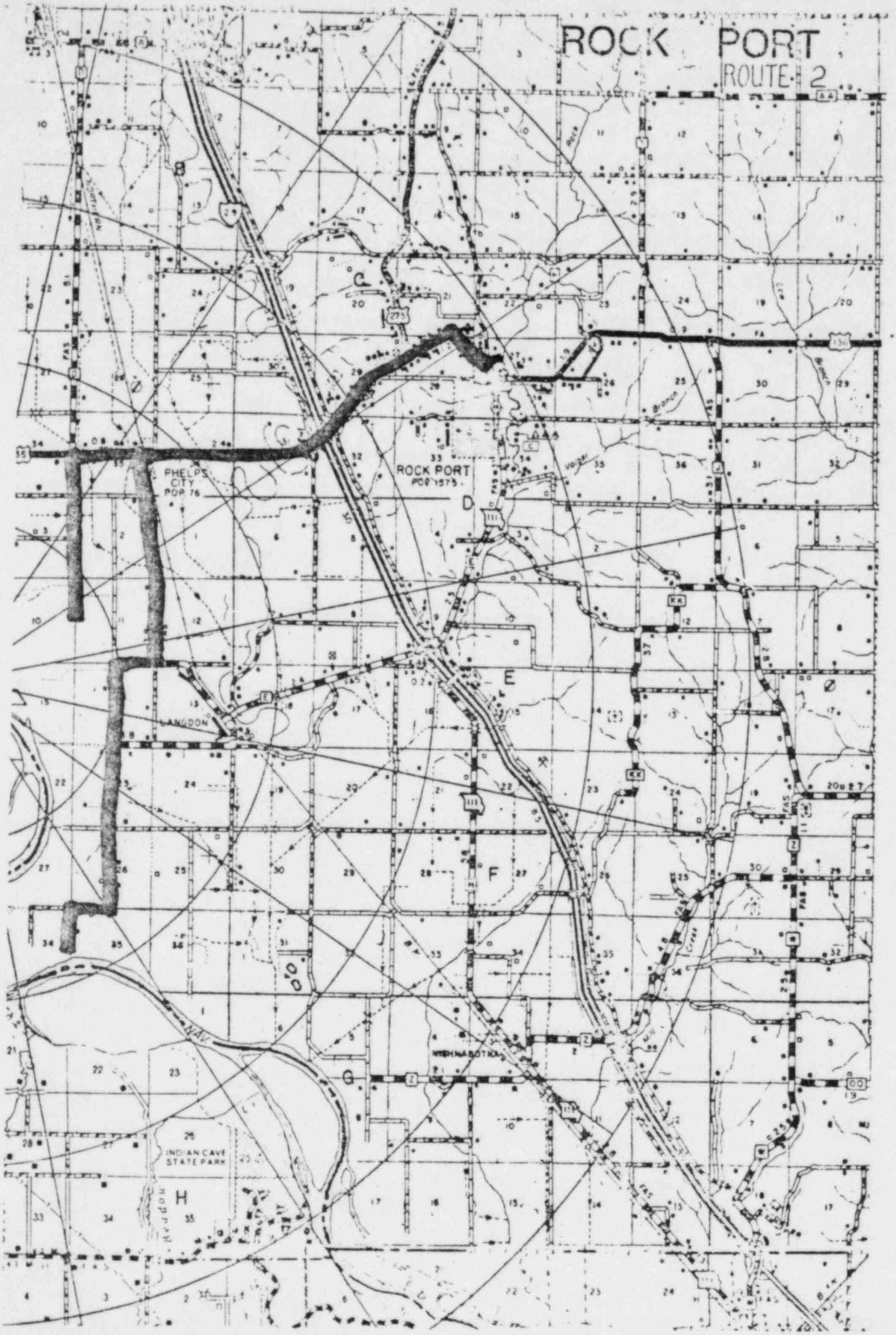
Attachment 6

RICHARDSON COUNTY SHERIFF



Handled by Richardson County Sheriff Department


ROCK PORT
ROUTE 1
ROCK PORT
POP 1575
PHELPS CITY
POP 76
LANGDON
INDIAN CAVE STATE PARK
NISHNABOTNA R.
NISHNABOTNA R.
A
B
C
D
E
F
G
H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ROUTE 2
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LANGDON
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HOPPER
B
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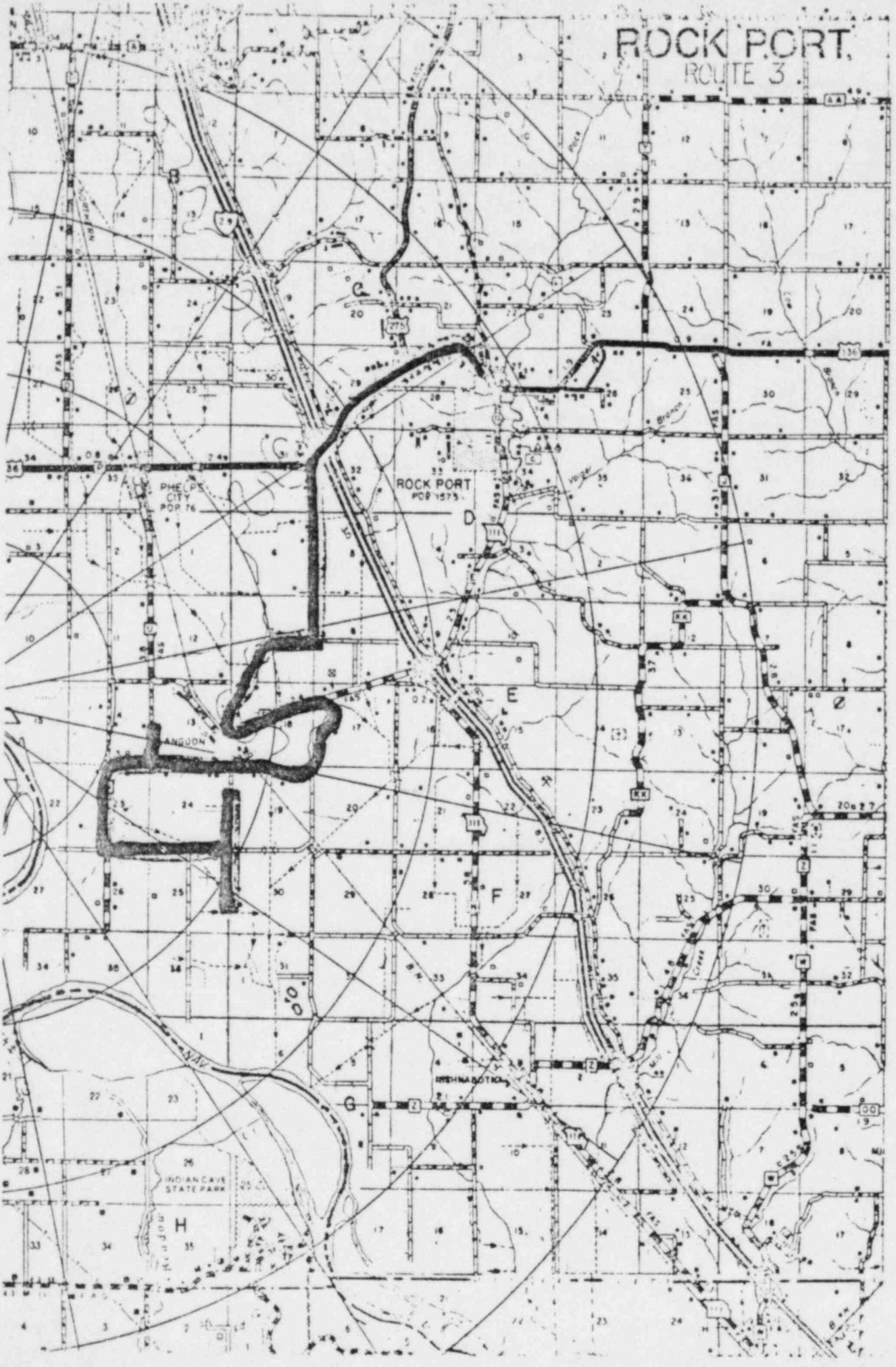
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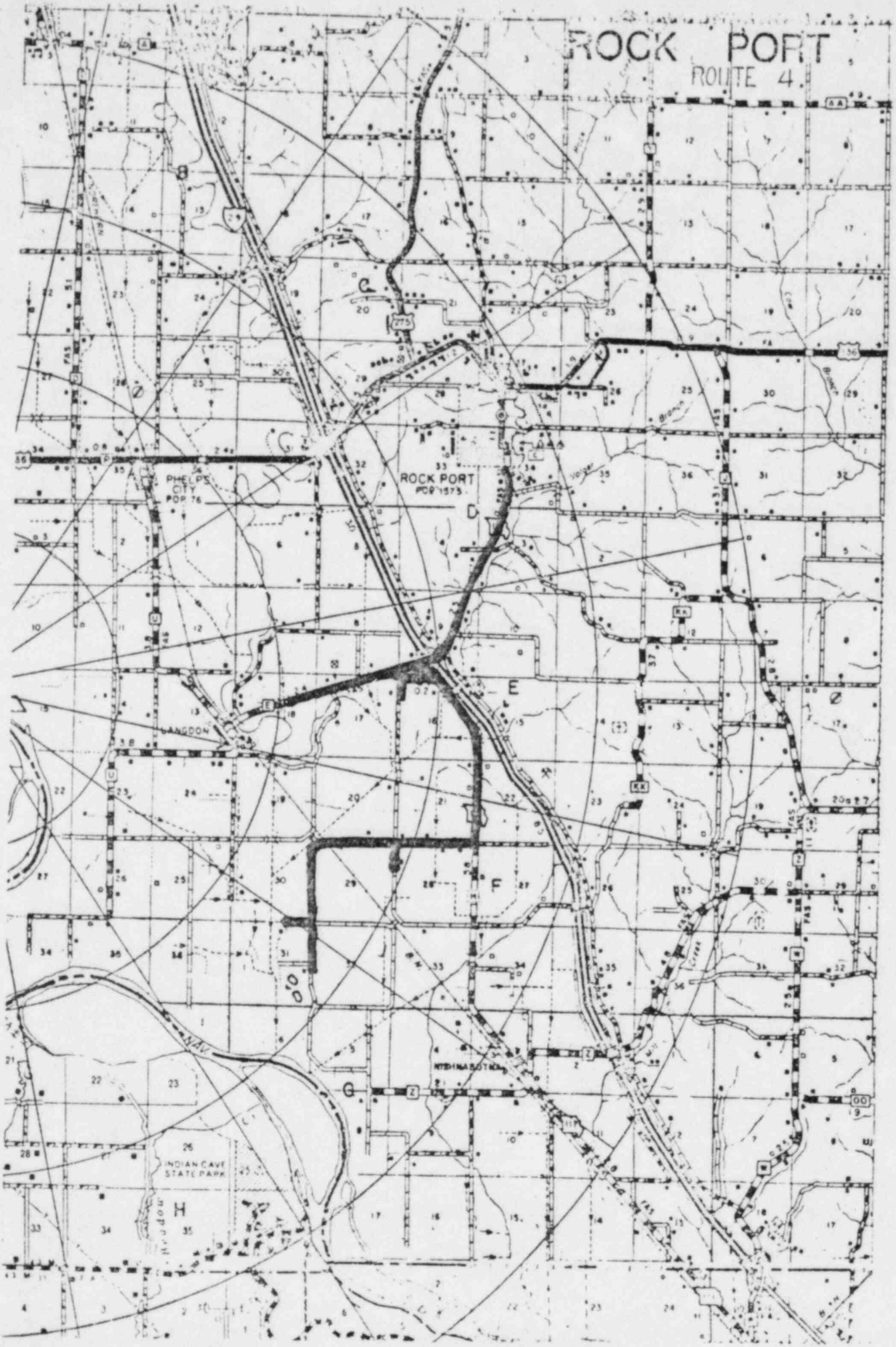
ROUTE 3
PHELPS CITY POP 76
ROCK PORT POP 1575
INDIAN CAVE STATE PARK
A
B
C
D
E
F
G
H


ROCK PORT
ROUTE 4
ROCK PORT
POP 1573
PHELPS CITY
POP 76
LANGDON
INDIAN CAVE STATE PARK
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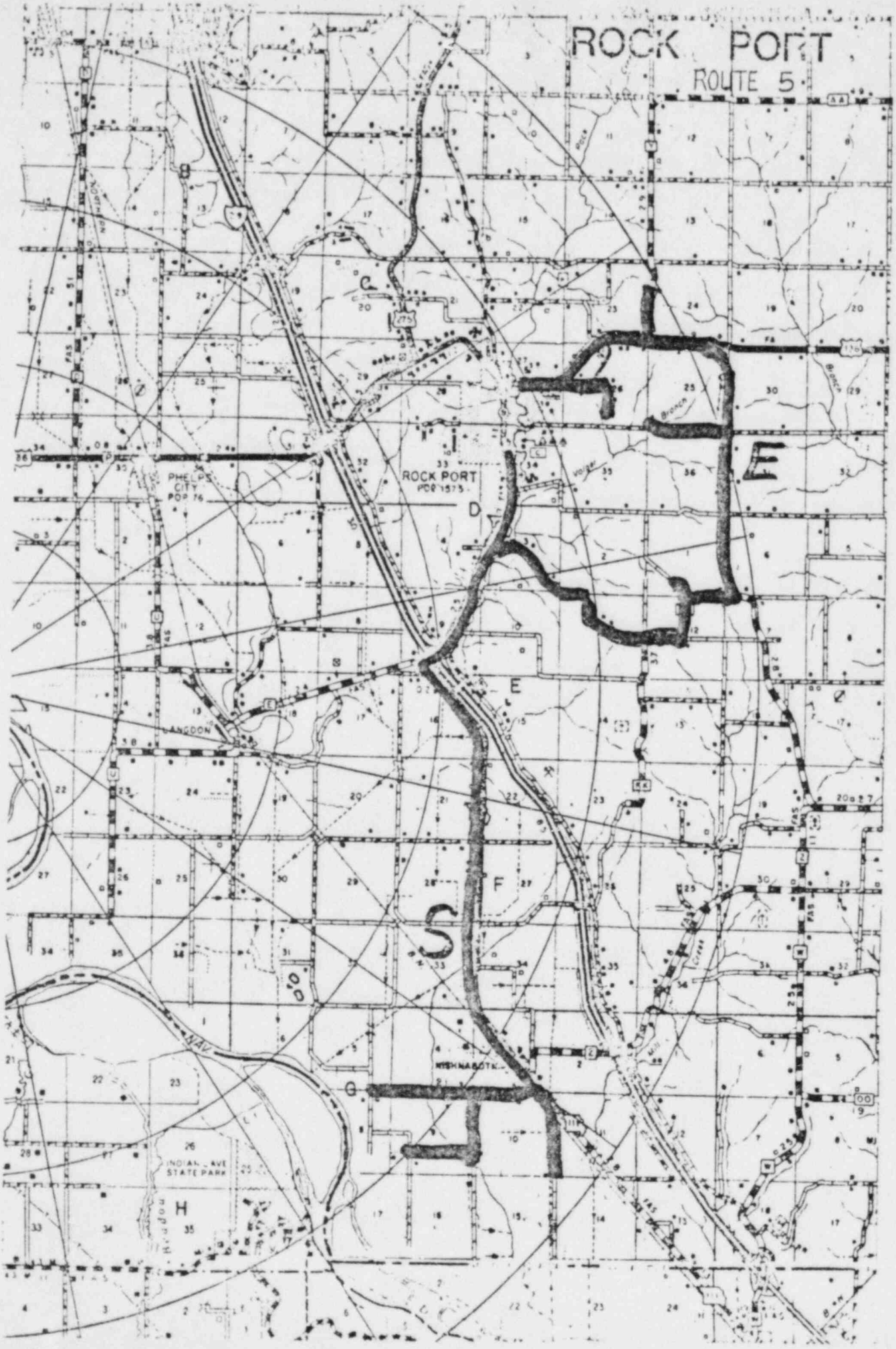
F
G
H


ROCK PORT
ROUTE 5
ROCK PORT
POP 1575
PHELPS CITY
POP 76
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C
D
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G
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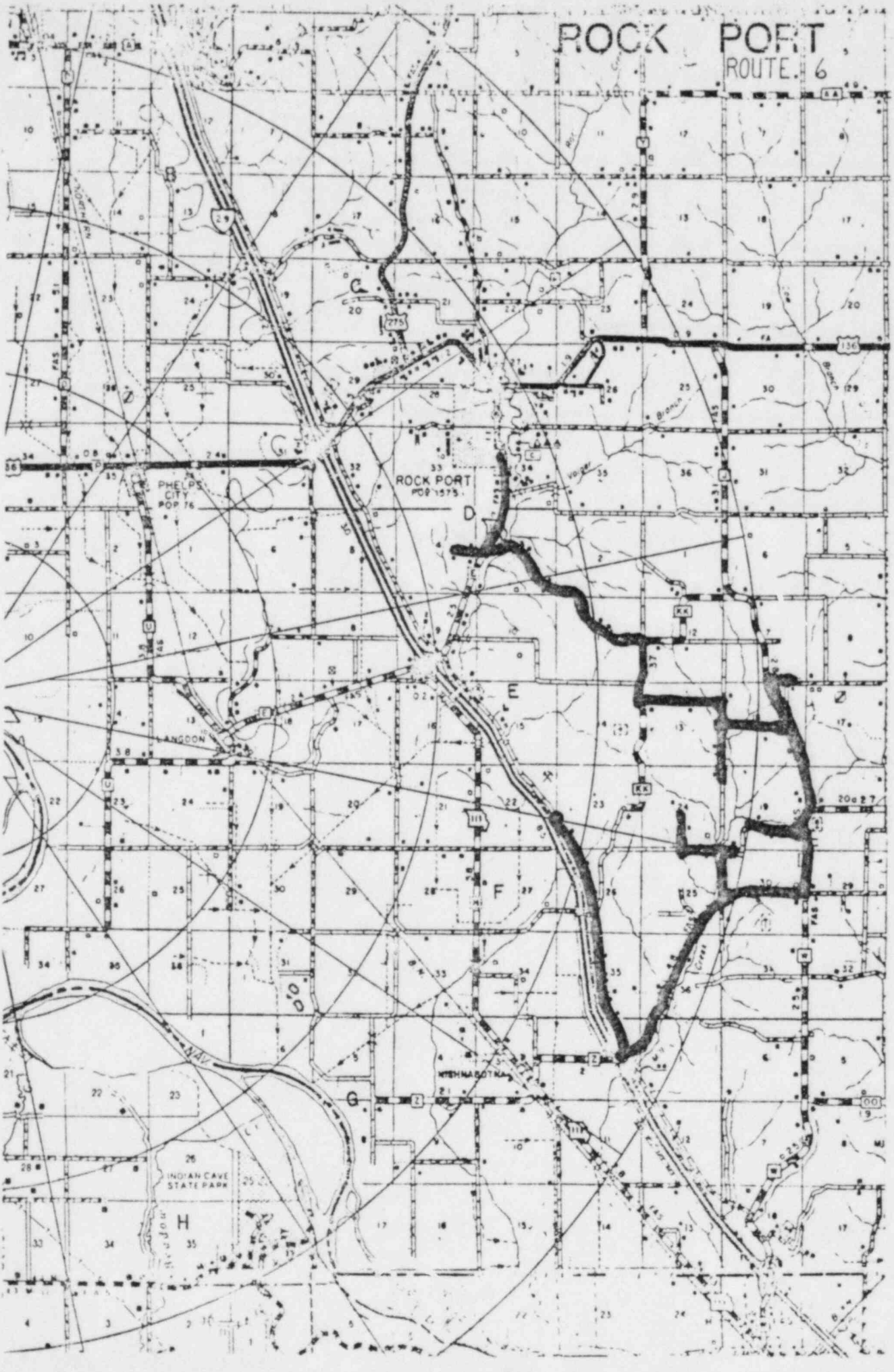
ROCK PORT
ROUTE 6
ROCK PORT
POP 1575
PHELPS CITY
POP 76
LANGDON
INDIAN CAVE STATE PARK
NISHNABOTNA
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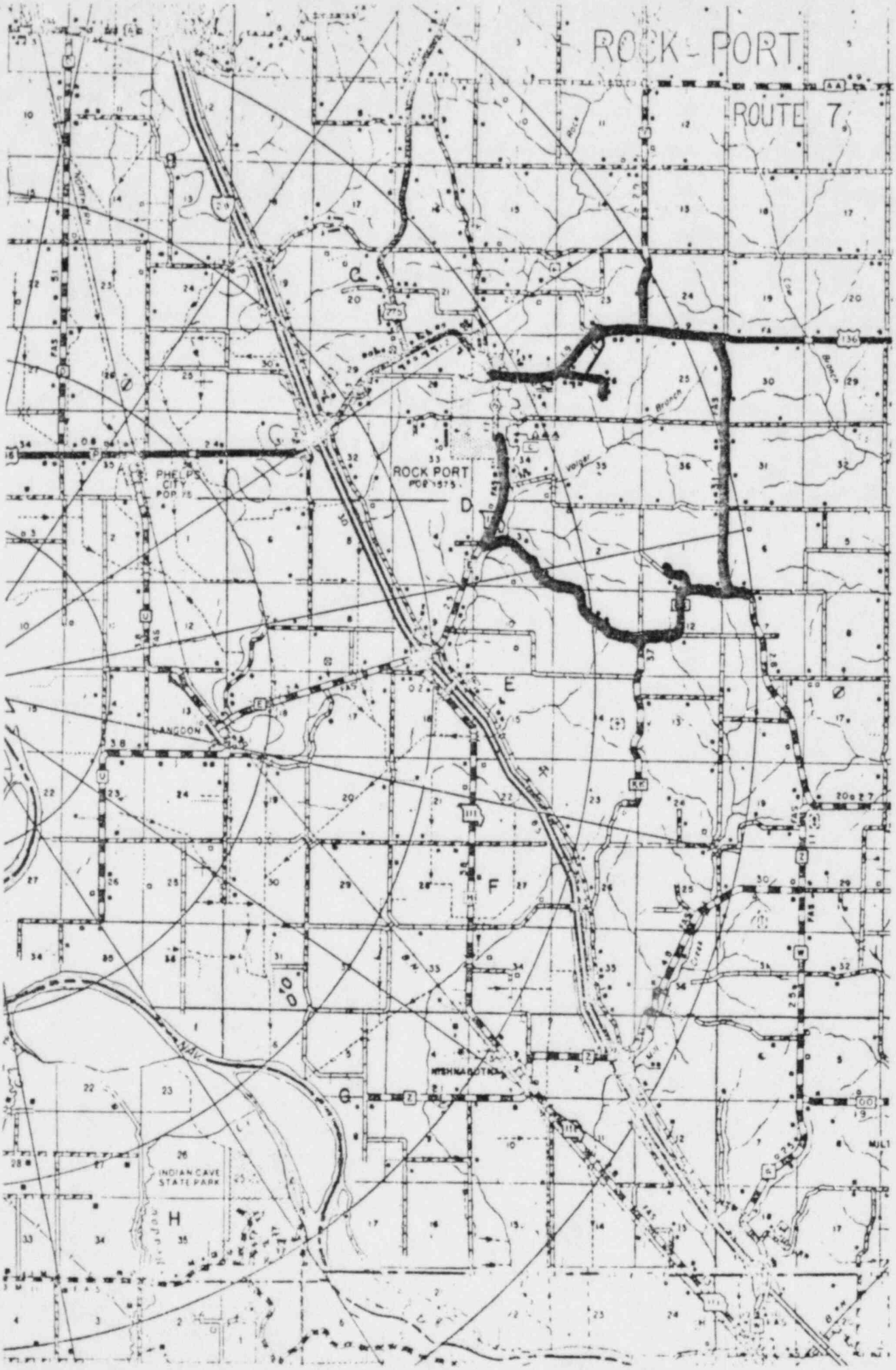
ROCK - PORT
ROUTE 7
ROCK PORT
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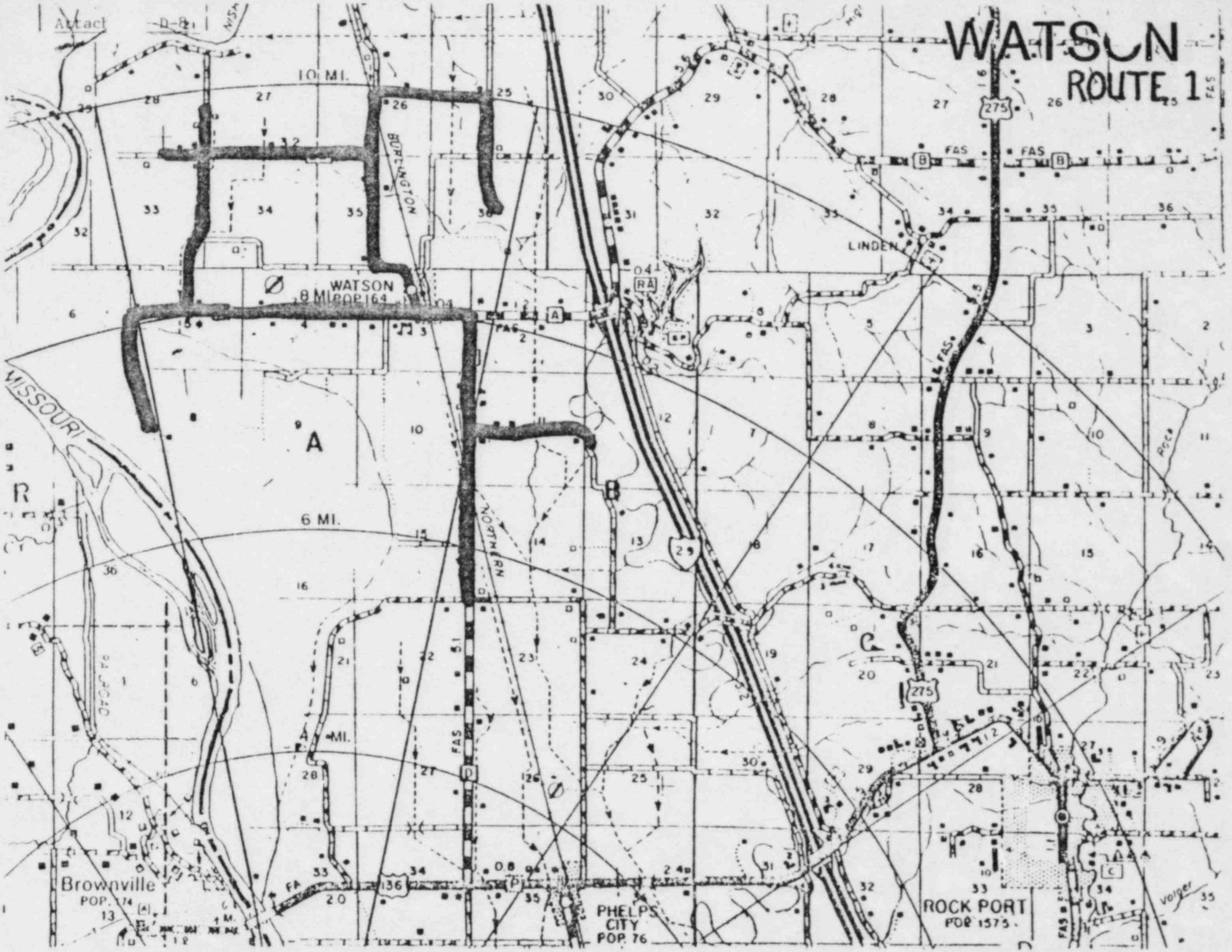
Attach D-8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6 MI.
4 MI.
WATSON
8 MI POP 164
LINDEN
MISSOURI
BURLINGTON
NORTHERN
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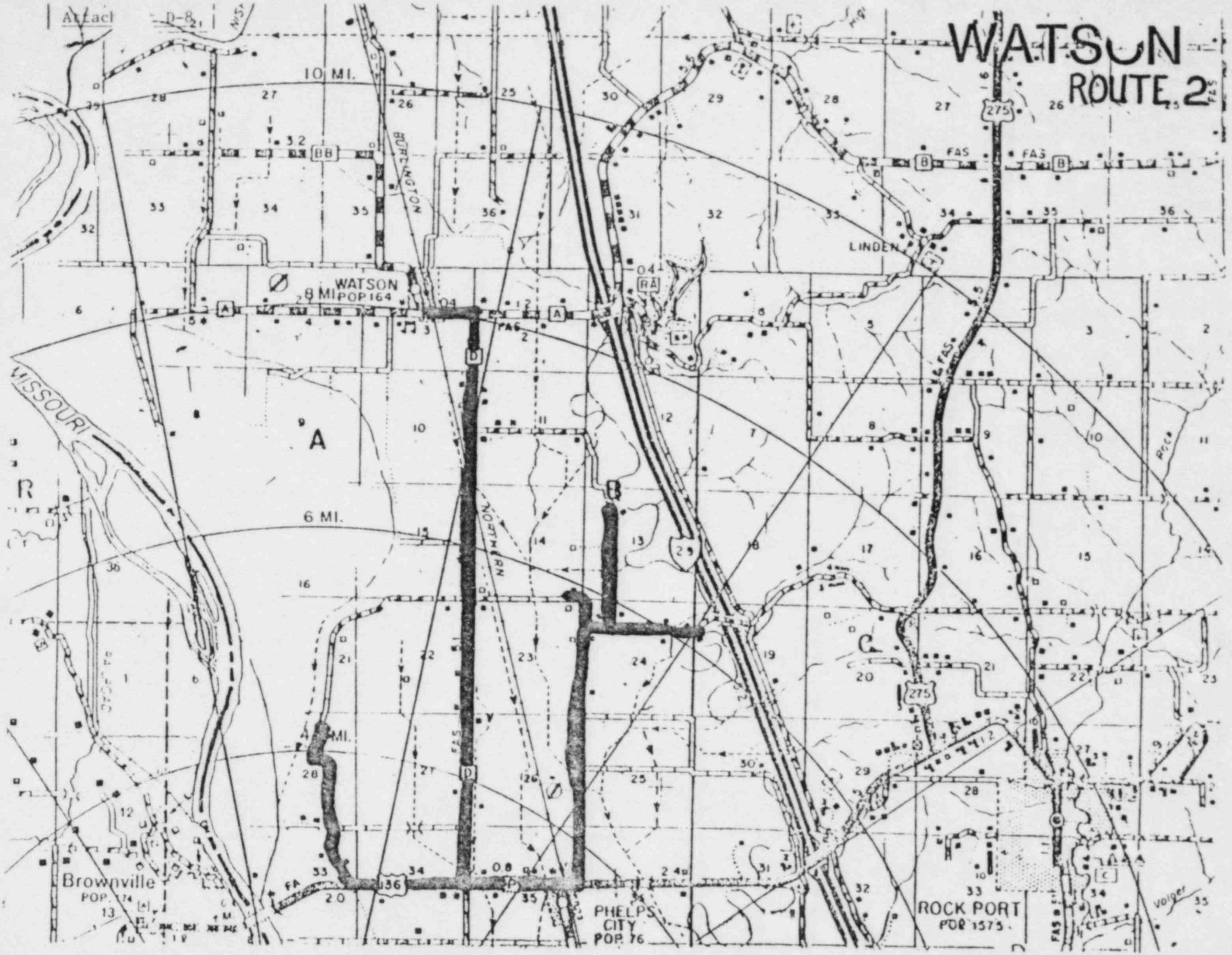
CITY
POP. 76
ROCK PORT
POP 1575
FAS
FA
275
29
136

Attach D-8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4 MI.
WATSON
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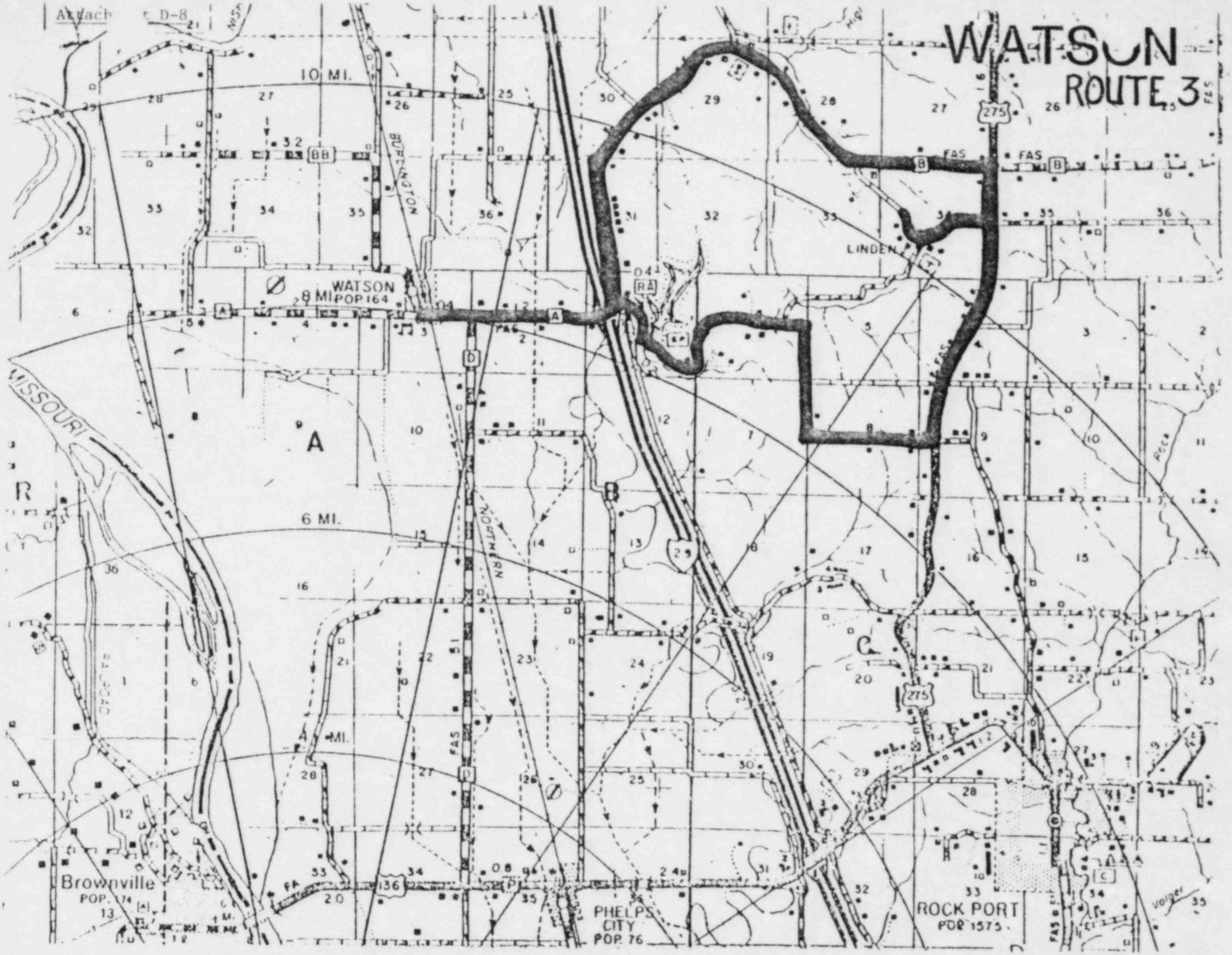
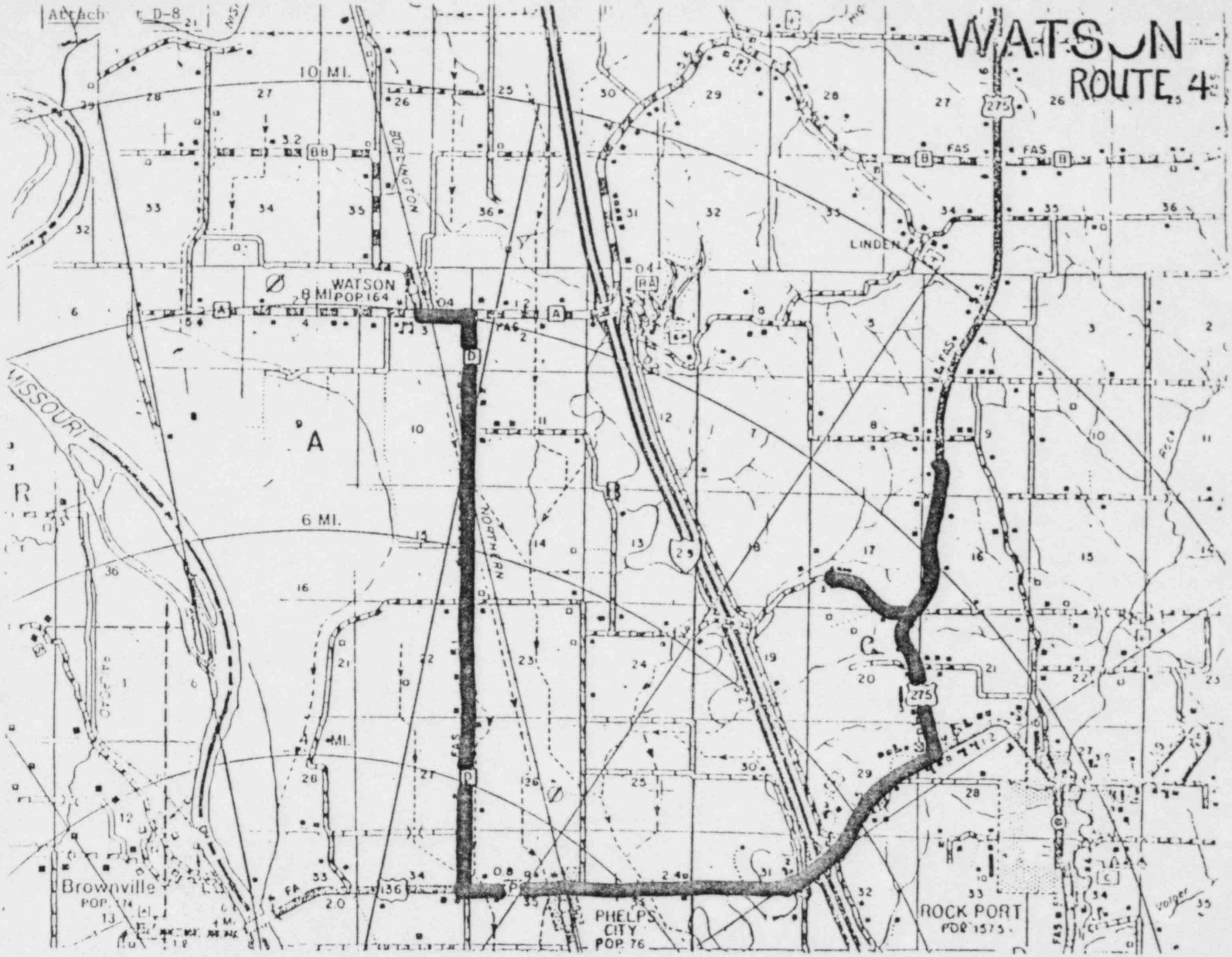
136

Attach D-8


WATSON
ROUTE 3
10 MI.
6 MI.
4 MI.
WATSON
8 MI POP 164
LINDEN
MISSOURI
BURLINGTON
NORTHERN
FAS
275
29
136
Brownville
POP. 74
PHELPS CITY
POP. 76
ROCK PORT
POP 1573
A
B
C

Attach t D-8


WATSON
ROUTE 4
10 MI.
6 MI.
4 MI.
WATSON
8 MI POP 164
LINDEN
BURLINGTON
NORTHERN
MISSOURI
Brownville
POP. 74
PHELPS
CITY
POP. 76
ROCK PORT
POP 1575
FAS
275
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136
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C

PERU VOLUNTEER FIRE DEPARTMENT - MOBILE SIREN PROCEDURE

This procedure outlines the steps to be taken in the event the Backup Mobile Siren System is activated. The Early Warning System for emergencies at Cooper Nuclear Station consists of fixed sirens located in the communities within the Emergency Planning Zone to alert residents to tune to the Emergency Broadcast System kHz for emergency information and EBS tone activated radios to alert rural residents. If the Backup Mobile Siren System is deemed necessary, the Sheriff will sound the fire siren or contact the Fire Chief and request the Fire Department to activate the mobile sirens. Please be aware that this system may also be used for floods, tornados, or other similar disasters.

1. The first volunteer to arrive at the Fire House will call the Nemaha County Sheriff in Auburn, Nebraska, at or by using the base radio. This person will be informed by the Sheriff that there is an emergency in progress at Cooper Nuclear Station and that the Peru Volunteer Fire Department personnel will drive their notification routes.

2. The first volunteer in the Fire House may remain there to inform the other volunteers as they arrive of the reason for the siren activation and what their required actions are.

3. The volunteers will then mount the mobile sirens, if not already mounted, and prepare to drive their prescribed routes in accordance with the following:

   a. Before leaving the Fire House activate the mobile siren to verify its operability.

   b. Obtain designated route.

   c. The driver will drive at normal speeds and as he approaches a household or person he will slow down to less than 30 mph and make this public announcement PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION.

   d. After completing the prescribed route, the driver will return to the Fire House, deenergize his siren, and inform the volunteer who stayed in the Fire House that he has completed the route.

4. When all routes are complete, call by telephone or radio the Nemaha County Sheriff confirming the completion of routes.

5. If any routes do not have drivers to cover them, the Fire House will make a call to the Nemaha County Sheriff (telephone number requesting a driver under the mutual aid understanding.

Note: If any mobile siren unit should fail or need maintenance immediately contact Cooper Nuclear Station at in order to effect repairs.

BROWNVILLE VOLUNTEER FIRE DEPARTMENT - MOBILE SIREN PROCEDURE

This procedure outlines the steps to be taken in the event the Backup Mobile Siren System is activated. The Early Warning System for emergencies at Cooper Nuclear Station consists of fixed sirens located in the communities within the Emergency Planning Zone to alert residents to tune to the Emergency Broadcast System kHz for emergency information and EBS tone activated radios to alert rural residents. If the Backup Mobile Siren System is deemed necessary, the Sheriff will sound the fire siren or contact the Fire Chief and request the Fire Department to activate the mobile sirens. Please be aware that this system may also be used for floods, tornados, or other similar disasters.

1. The first volunteer to arrive at the fire house will call the Nemaha County Sheriff in Auburn, Nebraska, using the base radio. This person will be informed by the Sheriff that there is an emergency in progress at Cooper Nuclear Station and that the Brownville Volunteer Fire Department personnel will drive their notification routes.

2. The first volunteer in the Fire House may remain there to inform the other volunteers as they arrive of the reason for the siren activation and what their required actions are.

3. The volunteers will then mount the mobile sirens, if not already mounted, and prepare to drive their prescribed routes in accordance with the following:

   a. Before leaving the Fire House activate the mobile siren to verify its operability.

   b. Obtain designated route.

   c. The driver will drive at normal speeds and as he approaches a household or person he will slow down to less than 30 mph and make this public announcement PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION.

   d. After completing the prescribed route, the driver will return to the Fire House, deenergize his siren, and inform the volunteer who stayed in the Fire House that he has completed the route.

4. When all routes are complete, contact the Nemaha County Sheriff using the base radio, confirming the completion of routes.

5. If any routes do not have drivers to cover them, the Fire House will contact the Nemaha County Sheriff requesting a driver under the mutual aid understanding.

Note: If any mobile siren unit should fail or need maintenance immediately contact Cooper Nuclear Station at in order to effect repairs.

NEMAHA VOLUNTEER FIRE DEPARTMENT - MOBILE SIREN PROCEDURE

This procedure outlines the steps to be taken in the event the Backup Mobile Siren System is activated. The Early Warning System for emergencies at Cooper Nuclear Station consists of fixed sirens located in the communities within the Emergency Planning Zone to alert residents to tune to the Emergency Broadcast System kHz for emergency information and EBS tone activated radios to alert rural residents. If the backup mobile siren system is deemed necessary, the Sheriff will sound the fire siren or contact the Fire Chief and request the Fire Department to activate the mobile sirens. Please be aware that this system may also be used for floods, tornados, or other similar disasters.

1. The first volunteer to arrive at the Fire House will call the Nemaha County Sheriff in Auburn, Nebraska, at or the Fire Chief's base radio. This person will be informed by the Sheriff that there is an emergency in progress at Cooper Nuclear Station and that the Nemaha Volunteer Fire Department personnel will drive their notification routes.

2. The first volunteer in the Fire House may remain there to inform the other volunteers as they arrive of the reason for the siren activation and what their required actions are.

3. The volunteers will then mount the mobile sirens, if not already mounted, and prepare to drive their prescribed routes in accordance with the following:

   a. Before leaving the Fire House activate the mobile siren to verify its operability.

   b. Obtain designated route.

   c. The driver will drive at normal speeds and as he approaches a household or person he will slow down to less than 30 mph and make this public announcement PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION.

   d. After completing the prescribed route, the driver will return to the Fire House, deenergize his siren, and inform the volunteer who stayed in the Fire House that he has completed the route.

4. When all routes are complete, call by telephone at or radio the Nemaha County Sheriff confirming the completion of routes.

5. If any routes do not have drivers to cover them, the Fire House will contact the Nemaha County Sheriff (telephone number requesting a driver under the mutual aid understanding.

Note: If any mobile siren unit should fail or need maintenance immediately contact Cooper Nuclear Station at in order to effect repairs.

SHUBERT VOLUNTEER FIRE DEPARTMENT - MOBILE SIREN PROCEDURE

This procedure outlines the steps to be taken in the event the Backup Mobile Siren System is activated. The Early Warning System for emergencies at Cooper Nuclear Station consists of fixed sirens located in the communities within the Emergency Planning Zone to alert residents to tune to the Emergency Broadcast System kHz for emergency information and EBS tone activated radios to alert rural residents. If the Backup Mobile Siren System is deemed necessary, the Sheriff will sound the fire siren or contact the Fire Chief and request the Fire Department to activate the mobile sirens. Please be aware that this system may also be used for floods, tornados, or other similar disasters.

1. The first volunteer to arrive at the Fire House will call the Richardson County Sheriff in Falls City, Nebraska, at This person will be informed by the Sheriff that there is an emergency in progress at Cooper Nuclear Station and that the Shubert Volunteer Fire Department personnel will drive their notification routes.

2. The first volunteer in the Fire House may remain there to inform the other volunteers as they arrive of the reason for the siren activation and what their required actions are.

3. The volunteers will then mount the mobile sirens and prepare to drive their prescribed routes in accordance with the following:

   a. Before leaving the Fire House activate the mobile siren to verify its operability.

   b. Obtain designated route.

   c. The driver will drive at normal speeds and as he approaches a household or person he will slow down to less than 30 mph and make this public announcement PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION.

   d. After completing the prescribed route, the driver will return to the Fire House, deenergize his siren, and inform the volunteer who stayed in the Fire House that he has completed the route.

4. When all routes are complete, call the Richardson County Sheriff at the telephone at , confirming the completion of routes.

5. If any routes do not have drivers to cover them, the Fire House will contact the Richardson County Sheriff at requesting a driver under the mutual aid understanding.

Note: If any mobile siren unit should fail or need maintenance, immediately contact Cooper Nuclear Station at in order to effect repairs.

ROCK PORT VOLUNTEER FIRE DEPARTMENT - MOBILE SIREN PROCEDURE

This procedure outlines the steps to be taken in the event the Backup Mobile Siren System is activated. The Early Warning System for emergencies at Cooper Nuclear Station consists of fixed sirens located in the communities within the Emergency Planning Zone to alert residents to tune to the Emergency Broadcast System . kHz for emergency information and EBS tone activated radios to alert rural residents. If the Backup Mobile Siren System is deemed necessary, the Sheriff will sound the fire siren or contact the Fire Chief and request the Fire Department to activate the mobile sirens. Please be aware that this system may also be used for floods, tornados, or other similar disasters.

1. The Rock Port Volunteer Firemen will be notified of an emergency by the Atchison County Sheriff who will contact them directly over their pagers by use of the tone encoder located in the sheriff's office. The Sheriff's Office telephone number is .

2. The volunteers should then proceed to the Fire House, mount the mobile units, if not already mounted, and prepare to drive their prescribed routes in accordance with the following:

   a. Before leaving the Fire House activate the mobile siren to verify its operability.

   b. Obtain designated route.

   c. The driver will drive at normal speeds and as he approaches a household or person he/she will slow down to less than 30 mph and make this public announcement PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION.

   d. After completing the prescribed route, the driver will return to the Fire House, deenergize his siren, and inform the volunteer who stayed in the Fire House that he has completed the route.

3. When all routes are complete, call the Atchison County Sheriff at the telephone at confirming the completion of routes.

4. If any routes do not have drivers to cover them, the Fire House will contact the Atchison County Sheriff at requesting a driver under the mutual aid understanding.

Note: If any mobile siren unit should fail or need maintenance immediately contact Cooper Nuclear Station at In order to effect repairs.

WATSON VOLUNTEER FIRE DEPARTMENT - MOBILE SIREN PROCEDURE

This procedure outlines the steps to be taken in the event the Backup Mobile Siren System is activated. The Early Warning System for emergencies at Cooper Nuclear Station consists of fixed sirens located in the communities within the Emergency Planning Zone to alert residents to tune to the Emergency Broadcast System . kHz for emergency information and EBS tone activated radios to alert rural residents. If the Backup Mobile Siren System is deemed necessary, the Sheriff will sound the fire siren or contact the Fire Chief and request the Fire Department to activate the mobile sirens. Please be aware that this system may also be used for floods, tornados, or other similar disasters.

1. The first volunteer to arrive at the Fire House will contact the Atchison County Sheriff in Rock Port, Missouri by telephone at , or by using the base radio. This person will be informed by the Sheriff that there is an emergency in progress at Cooper Nuclear Station and that the Watson Volunteer Fire Department personnel will drive their notification routes.

2. The first volunteer in the Fire House may remain there to inform the other volunteers as they arrive of the reason for the siren activation and what their required actions are.

3. The volunteers will then mount the mobile sirens, if not already mounted, and prepare to drive their prescribed routes in accordance with the following:

   a. Before leaving the Fire House activate the mobile siren to verify its operability.

   b. Obtain designated route.

   c. The driver will drive at normal speeds and as he approaches a household or person he will slow down to less than 30 mph and make this public announcement PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION.

   d. After completing the prescribed route, the driver will return to the Fire House, deenergize his siren, and inform the volunteer who stayed in the Fire House that he has completed the route.

4. When all routes are complete, call the Atchison County Sheriff by telephone at or base radio, confirming the completion of routes.

5. If any routes do not have drivers to cover them, the Fire House will contact the Atchison County Sheriff at , requesting a driver under the mutual aid understanding.

Note: If any mobile siren unit should fail or need maintenance immediately contact Cooper Nuclear Station at , in order to effect repairs.

NEMAHA COUNTY SHERIFF - MOBILE SIREN PROCEDURE

The siren routes are to be run in the event of activation of the prompt alerting system:

1. Dispatch two personnel in siren and public announcement equipped vehicles to cover the designated routes.
2. Before leaving, activate the mobile siren to verify its operability.
3. Obtain designated route.
4. The driver will drive at normal speeds and as he approaches a household or person he will slow down to less than 30 mph and make this public announcement PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION.
5. When the route has been completed, contact the Sheriff and inform him of completion of the route.

RICHARDSON COUNTY SHERIFF - MOBILE SIREN PROCEDURE

The siren routes are to be run in the event of activation of the prompt alerting system:

1. Dispatch personnel in siren and public announcement equipped vehicles to cover the designated routes in the Shubert area.

2. Before leaving, activate the mobile siren to verify its operability.

3. Obtain designated route.

4. The driver will drive at normal speeds and as he approaches a household or person he will slow down to less than 30 mph and make this public announcement PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION.

5. When the route has been completed, contact the Sheriff and inform him of completion of the route.

INDIAN CAVE STATE PARK - MOBILE SIREN PROCEDURE

In the event of an emergency at Cooper Nuclear Station or any emergency where notification of visitors to the Indian Cave State Park is deemed necessary by local and state emergency response personnel, the following should be observed:

1. Nemaha County Sheriff will contact Indian Cave State Park Rangers by telephone or radio and inform them of the emergency situation.

2. The Park Rangers will then drive throughout the park with mobile siren units and with the use of the PA system instruct visitors to PLEASE TURN TO YOUR EMERGENCY BROADCASTING STATION FOR EMERGENCY INFORMATION, or whatever emergency instructions the Park Rangers wish to convey.

3. After notification of visitors of the park is completed, the Park Ranger should radio the Nemaha County Sheriff and inform him of the completion of notification and status of any emergency actions.

Note: If the mobile siren units should fail during their monthly test or need maintenance, contact the Cooper Nuclear Station Maintenance Supervisor during normal working hours or the Control Room Shift Supervisor during non-working hours at . in order to effect repairs.

EBS TONE ACTIVATED RADIO OPERATING INSTRUCTIONS

This Emergency Warning Monitor is provided for your safety by NPPD:

1. Operation.

   a. Plug the unit in.

   b. Turn the unit on.

   c. Set the volume.

   d. Press and release the red button.

2. Battery test.

   a. Press the white button.

   b. The battery test light should illuminate. If it does not, the batteries need to be replaced.

3. Operations test.

   a. Press and hold the red button.

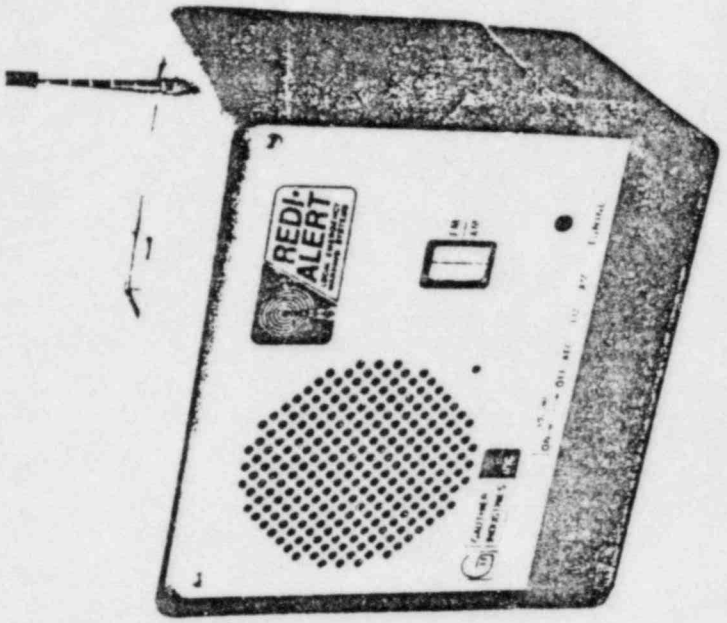
   b. Listen for the station's broadcast.

   c. Release the button.

Note: After activation by EBS attention tone, the radio will stay on until it is MANUALLY reset by pressing and releasing the red button. To report system failure or for further information call

COOPER NUCLEAR STATION

EARLY WARNING SYSTEM



EMERGENCY WARNING MONITOR

This radio receiver is being supplied to you by Nebraska Public Power District as your personal 24-hour **EMERGENCY WARNING MONITOR**. It will **silently** monitor the primary Emergency Broadcast System **(EBS)** station for your area. The unit is activated by a special signal from the EBS radio station. This means that your household will receive emergency warnings as they are being broadcast.

Government officials are responsible for providing notification and warning to an area in the event of an emergency. This radio **IS NOT** a replacement for siren systems or other warning methods. It is a **SUPPLEMENT** to these methods and will provide additional warning/notification capability to certain rural areas.

Your monitor is capable of receiving EBS broadcasts concerning:

- Tests of the EBS System
- Flash Flood Warnings
- Tornado Warnings
- Local Emergencies
- National Emergencies
- EMERGENCIES AT COOPER NUCLEAR STATION

The primary EBS station for your area may be alerted nationally by the president, on a statewide basis by the governor or his designated representative, and on the local level by individuals authorized by the local EBS plan. The EBS stations have special equipment that can be activated when they are notified of an emergency. When the station is notified, regular broadcasts are suspended and the special EBS Attention Tone is transmitted. This tone alerts people listening to the station, and **automatically** turns on your warning monitor. Immediately after the Attention Tone the announcer will broadcast a message about the particular emergency.

*The primary EBS Station to which your radio has **permanently** been tuned:*

NEBRASKA RESIDENTS
OMAHA ..... KFAB-AM ..... 1110 KHz (AM Radio Dial)

MISSOURI RESIDENTS
ST. JOSEPH ..... KFEQ-AM ..... 680 KHz (AM Radio Dial)

OPERATING INSTRUCTIONS

POWER:

The Redi-Alert receiver is designed to operate from normal household 110 volt power, utilizing the DC converter attached to the power plug. The unit also contains a battery pack to provide emergency power if there is a power failure. The **WHITE** button on top of the unit is a BATTERY TEST feature. When the unit is plugged into 110 volt power DEPRESS THE **WHITE** BUTTON. If the BATTERY TEST light illuminates, the batteries are at full voltage. If it fails to illuminate, it will be necessary to replace the batteries.

OPERATION:

The Redi-Alert receiver is meant to function as a WARNING MONITOR, **NOT** as a REGULAR RADIO.

Follow these steps to make the unit operational:

1. Choose a location where the emergency warning would most likely be heard.

(Place the unit on a countertop, shelf, night stand, or some area where it is not likely to be bumped.)

2. Plug the unit in.
3. Turn the unit ON.

(Be sure that station reception is CLEAR. The receiver may have to be turned or even moved to a different location to assure clear reception.)

4. Turn the volume to a LOUD level.
5. PRESS and RELEASE the **RED** reset button on the top of the receiver.

*(This places the unit in the SILENT monitoring mode. The PRESS and RELEASE of the **RED** reset button will also SILENCE the unit following an EBS broadcast.)*

OPERATIONAL TEST:

The Redi-Alert receiver may be checked from time to time by PRESSING and HOLDING the **RED** reset button. If it is operating properly, you will hear the radio station's broadcast. Release of the button will return the unit to the SILENT monitoring mode.

NOTE: *The ONLY way the receiver is AUTOMATICALLY activated is by the EBS Attention Tone from the radio station. This tone may signal a periodic test of the EBS System or it may be a signal for an emergency. A broadcast following the tone will explain the situation or announce the test. The unit will continue to play until it is MANUALLY reset. After the message is completed, you may return the unit to the SILENT monitoring mode by PRESSING and RELEASING the **RED** reset button.*

If your Redi-Alert unit fails to operate contact (_____) for further instructions.

If you are moving out of the 10-mile radius of Cooper Nuclear Station, contact (_____) and NPPD will arrange for someone to pick up your Redi-Alert unit.