I. PURPOSE

This Annex provides for a radiological program and outlines the organization, personnel, equipment and guides necessary to protect the citizens from potential effects of a disaster involving radioactive materials.

II. SITUATION AND ASSUMPTIONS

A. Situation

1. In the event of attack, foreign or domestic, upon the United States, the county may be subject to the effects of radioactive fallout.

2. Sheltering from radioactive fallout or other radioactive material may be required for population protection.

3. There are many types of incidents that can occur involving radioactive materials that would endanger the public. Many facilities in the county have radiation sources. Transportation of radioactive sources occurs in most communities.

4. Radiation measuring and detecting instruments used by trained personnel are the only means of gaining accurate radiological information in order to analyze the situation and take appropriate protective actions.

5. Summit County has a radiological protection program that includes specialized training of personnel.

6. Summit County has radiation detecting equipment that may be used following a radiation/nuclear exposure to determine radioactive fallout. A comprehensive list of equipment is on file at the Summit County Emergency Management Agency (SCEMA).

7. Summit County has an established notification and warning systems in place to notify persons in affected areas (refer to annex C – Notification and Warning and Annex D – Emergency Public Information).
8. Portions of Summit County are within the fifty (50) mile ingestion zone of the Perry Nuclear Power Plant. Should any type of incident occur in which portions of Summit County would be impacted, the Ohio Emergency Management Agency (OEMA) would notify the SCEMA\textsuperscript{1}.

B. Assumptions

1. All political subdivisions in Summit County are responsible for the safety of persons and property in their respective jurisdictions.

2. There may be possible limitations on the availability and amount of detection/monitoring equipment depending on the extent of the radiological/nuclear exposure and what the needs may be around the county.

3. Radioactive materials may be shipped in special containers designed to withstand severe accident conditions. Such containers may contain amounts of radioactive material, that if released due to accident, could potentially cause serious health and safety effects over large areas. Radioactive materials may also be stored and utilized in various facilities (mobile and fixed).

4. While there are licensing protocols through the Ohio Department of Health (ODH) for radioactive substances that may be used in industrial, education and medical use, accidental or malicious uses may be possible.

5. Industrial accidents may occur. Industry representatives best understand the characteristics of specific products, and often have both the equipment and expertise to advise and help respond at the site.

6. Local response agencies should have Standard Operating Guidelines (SOGs) for handling incidents with hazardous materials releases\textsuperscript{2}.

7. State and federal response resources are available to provide technical assistance and oversight of cleanup activities. The state can also request personnel and equipment from federal agencies\textsuperscript{3}.

8. In the event of a radiological event, emergency services, vital services (hospitals, utilities, etc.) and essential industries (food processing, storage and distribution and pharmaceutical manufacture and supply) may be required to operate in a fallout radiation environment. Each organization should prepare a SOG to operate in this type of environment.

\textsuperscript{1} Ohio Emergency Operations Plan, Emergency Support Function #10, Hazardous Materials/Weapons of Mass Destruction, April 2012
\textsuperscript{3} FEMA, Emergency Support Function #10, Oil and Hazardous Materials Response Annex, June 2016
III. CONCEPT OF OPERATIONS

A. The Radiological Protection Branch may consist of:

1. Radiological Protection Branch Director and Deputy;
2. Radiological Analyst Specialist;
3. Plotter Specialist;
4. Radiological Response Strike Team;
5. Radiation Monitors (RM);
6. Shelter Monitors (SM);
7. Radioactive Decontamination Leader (RDL) with Decontamination Personnel.

B. Responsibilities

1. Multi-Agency Coordination (MAC) Group

   The MAC will decide policy (i.e. evacuation, sheltering, shelter-in-place, etc.) based on recommendations from the Summit County Radiological Protection Branch Director, Summit County Public Health Department, ODH and the OEMA.

2. Radiological Protection Branch Director

   a. Supervises the county-wide radiological protection operations.

   b. Directs monitoring and reporting guides of entire Radiological Protection Branch.

   c. Prepares and presents radiological situation briefings to the EOC Command and General Staff positions.

   d. Prepares radiological information for release to the Public Information Officer (PIO).

   e. Submit required radiological situation reports to the State EOC.

   f. Provides decontamination guidance and training to emergency services.

   g. Advises the MAC group on protective measures (i.e. evacuation, sheltering, shelter-in-place, etc.) necessary to protect citizens threatened by the radiation hazards. This information may be based on Environmental Protection Agency (EPA) Protective Action Guides (PAGs), recommendations from the ODH, as well as criteria
consistent with Department of Health, Education & Welfare (DHEW), Food and Drug Administration (FDA), etc.

h. Identifies resources for radiological and chemical analysis, environmental assessment, biological sampling, plume movement tracking and contamination surveys.

i. Maintains inventory of Radiological Defense Program (RADEF) instruments.

j. Provides advice and assistance to the EOC staff, Community Reception Centers (CRC), monitoring stations, shelter staff and the general public on the full range of nuclear weapons effects, including the radiological hazard, fire and blast effects.

k. Estimates the impact on operational capabilities of the community.

l. Maintains close contact with the radiological monitoring network, shelter complex headquarters, adjacent communities, State EOC, and the military to receive reports of nuclear detonations, radiation intensity and other weaponry effects.

3. Radiological Protection Deputy

a. Serves as Chief Assistant to the Radiological Protection Branch Director.

b. Fills any vacant position in the EOC Radiological Protection Branch.

4. Radiological Analyst Specialist

a. Records and analyzes incoming radiological data to determine location, intensity and hazard to life; also predicts probable radiation decay times by mathematical extrapolation.

b. Determines exclusion zones (hot or evacuation area and/or warm or safety/buffer zones) where activity is permitted or restricted and for how long.

c. Identifies hazardous situations requiring immediate remedial action by emergency services.

d. Prepares estimates of shelter duration and decontamination requirements.
e. Documents listings of total population and residential statistics within the estimated Emergency Planning Zone (EPZ)\(^4\).

5. Plotter Specialist

a. Records incoming data in appropriate tabular form.

b. Prepares and maintains:
   1) Meteorological information;
   2) Fallout forecasts;
   3) Message and reporting logs;
   4) Dose and dose rate plots.

c. Maintains maps of all conditions.

6. Radiological Response Strike Team (RRST) Personnel

a. Serves as the responder-in-charge for radiological response.

b. Determines best options for environmental clean-up and waste distribution, implementation of environmental cleanup, and storage, treatment and disposal of oil and hazardous materials.

c. Stabilizes the release of hazardous chemicals and prevents the spread of contamination.

d. Serves as a community based cadre of radiological defense personnel.

e. Develops departmental plans and operating guides for radiological defense and radiological response.

f. Trains Summit County organization’s initial response personnel in radiological monitoring and response for nuclear attacks and for first response actions to a radiological emergency.

g. Conducts refresher/updated training for RM.

h. Serves as a trained cadre of instructors to conduct accelerated training during the surge period of a national event.

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i. Ensures the availability, operability, periodic maintenance and proper distribution of radiological instruments in their department.

j. Notifies and keeps the EOC informed of radiological conditions.

k. When necessary, performs all the duties of a RM.

7. Radiation Monitors

a. Serves as a first responder in radiological/nuclear emergencies.

b. Serves as a self-protection monitor in a radiological/nuclear attack environment.

c. Uses survey meters to identify areas of contamination.

d. Uses survey meters to identify the type and exposure rate of radiation.

e. Applies the radiation protection principles of time, distance and shielding in reducing exposure of the public to ionizing radiation.

f. Uses a dosimeter charger in zeroing a dosimeter.

g. Uses a dosimeter in determining accumulated dose of radiation.

h. Record evacuee identification and track radiological monitoring information.\(^5\)

i. Perform all the duties of SM, when necessary.

j. Reports Weapons Effects observations (refer to Appendix A – Chemical Emergency Response and Preparedness (LEPC)).

8. Shelter Monitors (SM)

a. Performs Radiological Monitor duties (c-h) in a Fallout Shelter.

b. Supports sheltered population by providing guidance on:

   1) Actions to reduce radiation levels in shelters;
   2) When and how restrictions on shelter living may be relaxed;
   3) Expected exposure levels.

9. Decontamination Personnel
   a. Decontaminates vehicles, equipment and facilities contaminated with radioactive particles.
   b. Recommends appropriate decontamination guides.
   c. Uses radiological equipment to determine the effectiveness of decontamination.
   d. Uses radiological equipment to protect personnel from excessive exposure.

C. Responsibilities of Agencies

1. The Summit County Emergency Management Agency
   a. Maintain radiological protection program.
   b. Provide oversight of distribution of radiological monitoring equipment to law enforcement agencies, fire departments, emergency medical services, CRCs and ARC shelters and other involved agencies for further disbursement.
   c. Augmenting Radiological Monitoring Teams, as necessary.
   d. Preparing Weapons Effects Reports and damage assessment reports (refer to Annex L – Damage Assessment) for submission to state and federal government agencies.
   e. Serve as point of contact to request state assistance or activation of the Ohio Fire Response Plan\(^6\).

2. Law Enforcement Agencies
   a. Distributing radiological monitoring equipment as requested by the EOC Manager.
   b. Receiving/transmitting National Warning System (NAWAS) information and provide additional communications, as needed.
   c. Responding to radiological incidents.

3. Fire/Rescue Services
   a. Serving as primary first responders to the incident location to detect and assess the extent of the contamination, provide for the initial containment and or begin prevention of the spread of the released material\(^7\).
   
b. Request the Summit County Hazardous Materials Response Team as needed.

4. Summit County Department of Sanitary Sewer Services
   a. May assist in decontamination operations.
   
b. Develops a self-protection/disaster recovery plan for some processes in place at the agency.

5. Summit County Public Health Department
   a. Provides recommendations to the Summit County Executive on shelter-in-place operations, provides recommendations for evacuations, and activates and provides oversight of the CRC operations.
   
b. Provides population monitoring by identifying persons contaminated with radioactive materials or exposed to radiation\(^8\).
   
c. Conducts and/or assists with decontamination operations at the CRC.
   
d. Provides a staff member to the Radiological Protection Branch upon activation of the EOC.

6. American Red Cross of Summit, Portage and Medina Counties
   a. Upon request, provide designation of temporary public shelters and care centers for use in a temporary location mode at least fifteen (15) miles from a given site.
   
b. Provide shelter and mass care resources in accordance with Annex K – Shelter and Mass Care.

D. General Operating Procedures

1. The Disaster Assessment Unit will be stationed in the EOC for the duration of the emergency. The Radiological Protection Branch (when activated) will receive, analyze and evaluate radiological data from the monitoring system and make recommendations concerning operational decisions in a radiological environment.

2. Monitors (when activated) stationed in appropriately dispersed centers of monitoring throughout Summit County will perform:
   a. On-station monitoring when radiation is expected and during the period when the radiation is present.
   b. Detailed mobile monitoring when radiation levels will permit limited outside operations on a controlled risk basis.

3. Shelter Monitors (when activated) will be positioned in each public shelter to provide:
   a. Detailed radiological information needed to conduct shelter operations.
   b. Radiation exposure records for all shelter occupants as a basis for decisions concerning out-of-shelter and post-shelter work assignments.

4. Communications between shelters, monitoring stations and the EOC shall be by telephone, when available (utilizing any emergency service radio as back-up). Notifications to the public will be made in accordance with Annex C – Notification and Warning and Annex D – Public Information.

5. State level radiological aerial monitoring and assessment capability.

6. All persons in the affected areas of Summit County will be notified of any coordinated evacuation in accordance with Annex J – Evacuation.

7. All residents and persons evacuated from affected areas in Summit County will be protected by the effects of radiation hazards through the identification of shelters and mass feeding locations in accordance with Annex K – Shelter and Mass Care.\(^9\)

E. Radiation Dose Reporting

1. Dosimeters should be read once every half an hour, at a minimum.

2. The on-scene Radiological Officer should record the dose for each individual exposed (refer to Tab 3 – Individual Dose Rate Records).

3. If the EOC is activated, the dose records should be continually reported to the EOC by the on-scene Radiological Officer and recorded at the EOC (refer to Tab 4 – Special Emergency Worker Dosimetry Packet Issue and Exposure Log).

4. The decision for authorizing emergency workers to incur exposures in excess of the Environmental Protection Agency (EPA) General Protective Guidelines should only be made in life-threatening circumstances and under guidance from health department personnel.

F. Total Population Exposure

1. The Radioactive Materials Safe Distance Chart will be used to determine exclusion zones needing evacuation to protect the public (refer to Tab 2 Radioactive Materials (Safe Distance)). These zones will include hot, evacuation area and warm or safety/buffer zones.

2. All citizens located within an area of concern will need to be monitored and decontaminated if readings from the CDV-700 register twice the local (uncontaminated) background or higher.

3. In the event of a radiological/nuclear attack, the entire county will most likely be affected by radiological fallout.

G. Decontamination

1. If the reading obtained measures twice the local (uncontaminated) background, skin, clothes, contaminated objects, areas and equipment need to be decontaminated.

2. Identify who will be responsible for decontamination and where it will occur (i.e. on-scene or a CRC).

3. Refer to Tab 5 – Decontamination of Vehicles and Equipment, Tab 6 – Personnel Decontamination Procedures, and Tab 7 – Area and Material Decontamination for methods of decontamination.
H. Phases of Emergency Management

1. Mitigation
   a. Establish a radiological program.
   b. Identify Radiological Safety Officers within Summit County.
   c. Develop and integrate a radiological reporting network.
   d. Develop a radiological response plan.

2. Preparedness
   a. Maintain radiological monitoring equipment.
   b. Conduct radiological exercises.
   c. Maintain radiological monitoring equipment.
   d. Identify potential sites for CRCs.
   e. Conduct public information and education programs.

3. Response
   a. Activate local, state and federal resources.
   b. Activate the Weapons Effects Reporting.
   c. Distribute bulk-stored RADEF instruments.
   d. Request mutual-aid for RADEF support from nearby counties and assistance from the OEMA.
   e. Stabilize a release and prevent the spread of contamination.
   f. Conduct environmental cleanup, waste disposition and storage, and treatment and disposal of oil and hazardous materials.

4. Recovery
   a. Continue ground and aerial monitoring.
   b. Initiate decontamination activities.
c. Continue public information and education programs.

d. Continue damage assessment activities.

e. Conduct environmental restoration.

IV. ORGANIZATION AND ASSIGNMENT OF RESPONSIBILITIES

A. Execution

1. The SCEMA is responsible for maintaining this Annex and ensuring the proper execution of the plan in time of emergency (refer to Tab 1 – Radiological Protection Emergency Notification Roster).

2. The Radiological Protection Branch will collect data on nuclear incidents, spills or releases and the hazards that accompany them.

3. The Radiological Protection Branch will use all resources as necessary to furnish radiological information to authorities at all levels of government as a basis for making decisions affecting the following:

   a. The periods of shelter occupancy.
   
   b. Control radiation exposure of emergency workers during shelter and post shelter periods.
   
   c. Decontamination activities.
   
   d. Food and water supplies.
   
   e. Restoration of vital facilities.
   
   f. Relocation of people to avoid radiation.
   
   g. Rescue, medical and welfare operations.
   
   h. Public service organizations.

V. DIRECTION AND CONTROL

The Radiological Protection Branch Director is responsible for coordinating all radiological activities within Summit County. The Radiological Protection Branch Director will establish operations within the EOC, supervise plotting, damage assessment, decontamination operations and to advise EOC personnel on necessary protective measures to ensure continuous emergency operations.
VI. CONTINUITY OF GOVERNMENT

A. The line of succession for the Radiological Protection Branch Director is as follows:

1. Radiological Protection Branch Director
2. Radiological Protection Deputy
3. Senior Unit Leader


VII. ADMINISTRATION AND LOGISTICS

A. Training and Exercises

1. Each emergency service, vital facility and essential industry will have at least one (1) person trained as a RRST member. Two (2) RMs must be trained for each instrument set issued.

2. Additional training will be conducted on an as needed basis as personnel are available to be scheduled into the training classes. Refresher training will be given to all RMs, RRSTs and RDLs at least every two (2) years.

3. Accelerated training of RMs and Decontamination Specialists will be conducted in the event a nuclear emergency appears to be imminent, if the mass distribution of instruments is ordered or if the president/governor orders an evacuation of high-risk areas.

4. Emergency service personnel will be exercised in the context of nuclear attack scenarios as well as peacetime radiological incidents.

B. Equipment

1. Radiological monitoring equipment is owned and strategically stored by the County. A comprehensive list of equipment is stored on file at the SCEMA.

2. All fire departments have the protective equipment and clothing to perform assigned tasks in a hazardous chemical or radiological environment, however, this is not disposable and would have to be either decontaminated or replaced.
C. Monitoring Stations

1. All fire departments and EMS stations in the county are designated monitoring stations for Summit County.

2. All self-protection facilities and shelters are considered back-up monitoring stations.

3. Other monitoring stations will be established as necessary.

VII. PLAN DEVELOPMENT AND MAINTENANCE

A. All agencies, departments and organizations with radiological protection responsibilities are responsible for reviewing this Annex at least once per year and submitting new or updated information to the SCEMA.

B. All agencies, departments and organizations with radiological protection responsibilities are also responsible for developing and maintaining SOGs, mutual-aid agreements, personnel rosters (including 24-hour emergency numbers), and resource inventories (including source, location and quality).

IX. AUTHORITIES AND REFERENCES

A. Authorities

1. 29 CFR 1910.120 – Hazardous Waste Operations and Emergency Response

B. References

1. CPG 2-1, Radiological Defense Preparedness, September 1989
2. CPG 3-1, Radiological Instruments, September 1986
X. ADDENDUMS

Tab 1 – Radiological Protection Emergency Notification Roster
Tab 2 – Radioactive Materials (Safe Distances)
Tab 3 – Individual Dose Records
Tab 4 – Special Emergency Worker Dosimetry Packet Issue and Exposure Log
Tab 5 – Decontamination of Vehicles and Equipment
Tab 6 – Personnel Decontamination Report
Tab 7 – Area and Material Decontamination
TAB 1 TO ANNEX M

RADIOLOGICAL PROTECTION EMERGENCY NOTIFICATION ROSTER

OFFICERS

Summit County Emergency Management Agency Director

RRT

Summit County Emergency Management Agency Director

MONITORS

Any member of the Summit County Hazardous Materials Response Team.
RADIOACTIVE MATERIALS (SAFE DISTANCE)

CLASS
RADIOACTIVE MATERIAL
SIZE: ALL

A

UNDER 200 POUNDS (90 KILOGRAMS) GROSS WEIGHT ?
KEEP 20 FEET (6 METERS) AWAY

OVER 200 POUNDS (90 KILOGRAMS) GROSS WEIGHT ?
EVACUATE TO 500 FEET (150 METERS) ALL DIRECTIONS

ESCORTED BY DOD OR DOE GUARDS ?
FOLLOW ESCORTS INSTRUCTIONS
IF GUARDS ARE INCAPACITATED, EVACUATE TO 1500 FEET (450 METERS) ALL DIRECTIONS

VERY LARGE CASK ?
EVACUATE TO 2500 FEET (750 METERS)
### INDIVIDUAL DOSE RATE RECORDS

<table>
<thead>
<tr>
<th>Radiation Exposure Record</th>
<th>Date(s) of Exposure(s)</th>
<th>Daily Dose(s)</th>
<th>Total Dose to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSN:</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date(s) of Exposure(s)</th>
<th>Daily Dose(s)</th>
<th>Total Dose to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FRONT SIDE**

**BACK SIDE**
Decontamination of vehicles and equipment of the various operational services, such as fire departments, police departments, and decontamination teams, will be the responsibility of the various services, aided by radiological defense services. Individuals will be responsible for decontamination of their own vehicles and equipment in accordance with instructions of local government.

The simplest and most obvious method for particle decontamination of vehicles and equipment is by water hosing. Quick car-washing facilities are excellent for more thorough decontamination.

Special precautions should be used when vehicles and equipment are brought in for maintenance. The malfunctioning part of the vehicle or equipment should be checked for excessive contamination.

Hosing should not be used on upholstery or other porous surfaces or the interior of vehicles, as the water would penetrate and carry the contamination deeper into the material.

The interior of vehicles can be decontaminated by brushing or vacuum cleaning. Guides for decontaminating interiors of vehicles by vacuum cleaning are similar to those used on the interior of structures.

Upon completion of missions in contaminated areas, vehicles and equipment used by decontamination personnel should be monitored, and decontaminated if necessary. Attempts should be made to reduce the hazard to tolerable levels.

A paved area set up for decontamination would be the best place for decontaminating vehicles and equipment, because it could be hosed off after decontamination.

Monitoring should follow each decontamination procedure to determine if further treatment is required.
<table>
<thead>
<tr>
<th>METHOD</th>
<th>ACTION</th>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surfaces and Hands</td>
<td>Wash 2-3 minutes and monitor. Do not wash more than 2 times.</td>
<td>Readily available and effective for radioactive contamination.</td>
<td>Continued washing will defat the skin and discriminate affected parts may further contaminate.</td>
</tr>
<tr>
<td>Hair</td>
<td>Wash not more than twice.</td>
<td>Same as above.</td>
<td>Continued washing will abrade the skin.</td>
</tr>
<tr>
<td>Skin and Hands</td>
<td>Mild soap and water</td>
<td>Emulsifies and dissolves contamination.</td>
<td></td>
</tr>
<tr>
<td>AREA AND MATERIAL DECONTAMINATION TECHNIQUE</td>
<td>ACTION</td>
<td>SURFACE</td>
<td>METHOD</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>--------</td>
<td>---------</td>
<td>--------</td>
</tr>
<tr>
<td>Vacuum cleaning</td>
<td>Remove contaminated dust by suction.</td>
<td>Dry Surface</td>
<td>Vacuum cleaning</td>
</tr>
<tr>
<td>Water</td>
<td>Dissolves and erodes.</td>
<td>Al non-porous surfaces (metal, plastic, etc.)</td>
<td>Water</td>
</tr>
<tr>
<td>Water</td>
<td>Determine cleaning rate experimentally. If possible, use a rate of 4 sq. ft. per minute.</td>
<td>All surfaces</td>
<td>Water</td>
</tr>
<tr>
<td>Steam</td>
<td>Dissolves and erodes.</td>
<td>Non-porous surface (especially painted or coated surfaces).</td>
<td>Steam</td>
</tr>
</tbody>
</table>

**ADVANTAGES**

- Good on dry, porous surfaces. Avoid water reactions.
- All water equipment may be utilized. Allows operation to be carried out from a distance.
- All equipment is vacuumed out at the end of the cleaning process.
- Extremely effective if done immediately after spill and on non-porous surfaces.
- Contamination may be reduced by 50%.

**DISADVANTAGES**

- All dust must be filtered out of the exhaust. Machine is contaminated.
- Drainage may be applicable on dry surfaces not applicable on porous surfaces such as wood, concrete, canvas, etc. Spray will be decontaminated.
- Little value in the decontamination of large areas, long-standing contaminants and porous surfaces.
- Steam subject to some limitations as water spray hazard makes the wearing of waterproof outfits necessary.

**TAB 7 TO ANNEX M**