ALABAMA DEPARTMENT OF PUBLIC HEALTH
OFFICE OF RADIATION CONTROL

RADIOLOGICAL FIELD MONITORING TEAM MANUAL

2023

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INSTRUCTIONS FOR
RADIOLOGICAL FIELD MONITORING TEAMS

General: The Alabama Department of Public Health (ADPH), Office of Radiation Control (ORC) is the agency responsible for coordinating off-site radiological monitoring operations. These emergency monitoring and sampling activities will be directed from the State Radiological Monitoring and Assessment Centers (SRMAC) located in the Prattville, Alabama or in Houston County, Dothan, Alabama or in Morgan County, Decatur, Alabama.

Purpose: These instructions are to ensure that timely and accurate information about types, quantity, and location of any radioactive material released is provided in a uniform format for analysis and assessment.

Control: The SRMAC controls and directs all off-site monitoring and sampling efforts within the State of Alabama for Joseph M. Farley Nuclear Plant and for Browns Ferry Nuclear Plant. All agencies will coordinate their off-site Radiological Field Monitoring Teams (RFMT) through the SRMAC to ensure completeness of area monitoring and to avoid duplication of effort. Each organization will provide a liaison familiar with their organization, equipment, and operational procedure to the SRMAC to assist in the deployment of available resources.

Communications: The primary means of communication with the RFMT will be via CBRN Responder and/or CriticalLinc radios. For nuclear power plant emergencies, Alabama Power Company (APCo) teams will be controlled through the APCo radio system and the Tennessee Valley Authority (TVA) teams will be controlled through the TVA radio system. If additional monitoring or sampling teams from other agencies are needed, teams will be provided portable radios with the Radiation Control Agency/Alabama Emergency Management Agency fleet which will be controlled from the SRMAC. (Information on instructions for use of CBRN Responder and CriticalLinc Radios are provided in manual). Use three-way communication as a best practice when relaying and receiving field team information.

The secondary (back-up) means of communication with SRMAC will be conventional cellular telephones and GroupMe App for the applicable RFMT.

Personal Protective Equipment: The Radiation Control Field Team Coordinator, in conjunction with the SRMAC Director, will determine what appropriate personal protective equipment (PPE) should be donned for the radiological accident or incident.

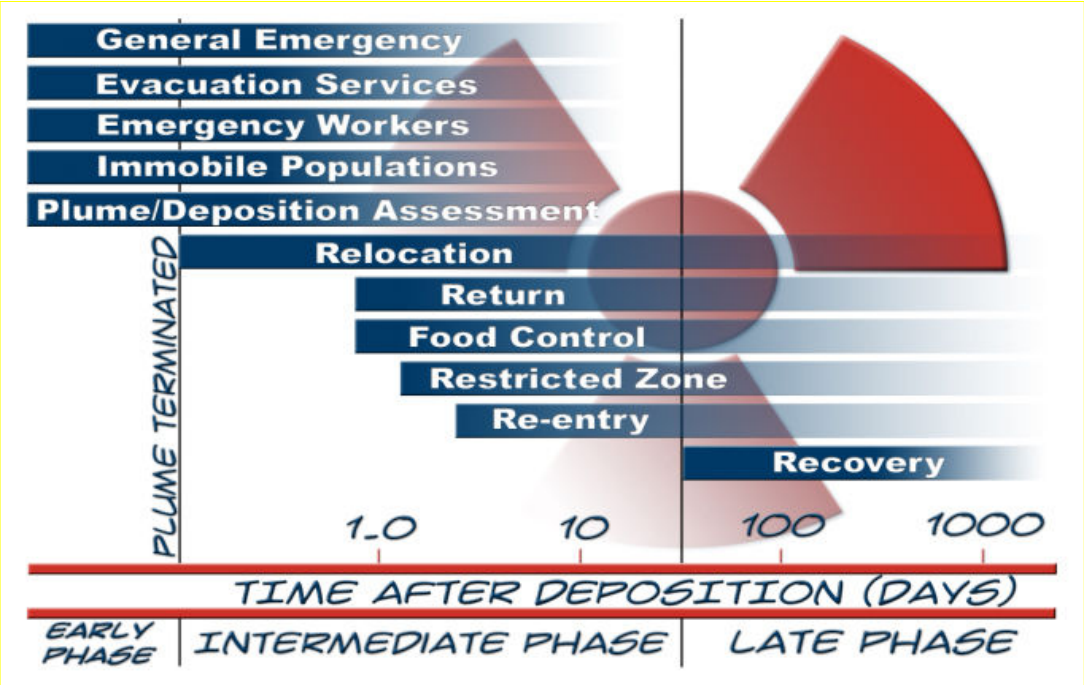
Assembly and Dispatch (Prattville): Upon notification, the State Radiation Control Office will act as the subject matter expert and liaison for all radiological emergencies. The senior ranking member present at the time of notification shall be known as SRMAC Director and will make the decision as to whether to activate and staff the SRMAC located at 208 Legends Court, Suite C, Room 150, Prattville, Alabama. The SRMAC Director may assign staff various duties needed and required to support the event. If the situation warrants, the SRMAC Director may dispatch RFMTs from the office in Montgomery. All radiological equipment required for a response is maintained and stored at this location. Furthermore, the SRMAC Director will consider sending staff forward (Decatur SRMAC or Dothan SRMAC) to better manage response activities.

Assembly and Dispatch (Farley): Initial RFMTs will be dispatched locally from the Houston County Health Department located at 1781 East Cottonwood Road in Dothan, Alabama. The equipment is maintained in the Office for Environmental Health and is inventoried by the Office of Radiation Control (ORC). Upon initial notification, RFMTs will proceed to the downwind boundary of the evacuation area or restricted area and begin monitoring while awaiting further instructions from SRMAC. Additional RFMTs will contact SRMAC in Dothan, Alabama, to receive instructions and maps. SRMAC will coordinate the deployment of additional RFMTs and/or relief for existing RFMTs. The equipment exchange meeting place will be at the Houston County Health Department located at 1781 East Cottonwood Road in Dothan unless otherwise directed by SRMAC. RFMTs should survey themselves and vehicles prior to arrival and return to the Houston County Health Department.

Assembly and Dispatch (Browns Ferry): Initial RFMTs will be dispatched locally from the Morgan County Health Department, 3821 Highway 31 South in Decatur, Alabama and Limestone County Health Department, 20371 Clyde Mabry Drive in Athens, Alabama. The equipment is maintained in both locations in their respective Office for Environmental Health and is inventoried by the ORC. Upon initial notification, RFMTs will proceed to the downwind boundary of the evacuation area or restricted area and begin monitoring while awaiting further instructions from SRMAC. Additional RFMTs will contact the SRMAC in Decatur, Alabama to receive instructions and maps. SRMAC will coordinate the deployment additional RFMTs and/or relief for existing radiological field monitoring teams. The equipment exchange meeting place will be at the Morgan County Health Department located at 3821 Highway 31 South in Decatur unless otherwise directed by SRMAC. RFMTs should survey themselves and vehicles prior to arrival and return to the Morgan County Health Department.

Team Formation: Formation of RFMTs will be based on the three phases of a nuclear power plant accident (see phases below). These are Early/Plume Phase, Intermediate/Ingestion Phase and Late/Recovery Phase.

THREE PHASES OF A NUCLEAR POWER ACCIDENT



Early phase - The time interval at the beginning of a nuclear incident when immediate decisions based primarily on predictions of radiological conditions in the environment are necessary for effective use of protective actions. The early phase may last from hours to days. The early phase is assumed to last four days for the purpose of dose projection. In the Early/Plume phase, team formation will consist of state and county RFMTs. The state team(s) will be composed of two trained Radiation Physicists from the State Office of Radiation Control. The county teams are made up of two trained Public Health Environmentalists who are employed in counties located in the 10-mile emergency planning zone.

Intermediate phase - The time interval beginning after the source and/or release has been brought under control and reliable environmental measurements are available for use as a basis for decisions on additional protective actions. This phase continues until protective actions are terminated. This phase may overlap the early and late phases and may last from weeks to many months. The intermediate phase is assumed to last for one year for the purpose of dose projections. In the Intermediate/Ingestion Phase, the state and county RFMTs will be composed of the same aforementioned personnel in the Early/Plume Phase but will be supported by milk inspectors with the Alabama Department of Public Health, Division of Food, Milk, and Lodging and agriculture specialists with the Alabama Department of Agriculture and Industries. There are also numerous federal assets involved in field sampling who will be coordinated through SRMAC.

Late phase - The time interval that begins when recovery actions, designed to reduce radiation levels in the environment to permanently acceptable levels, begin. This phase ends when recovery actions have been completed. The late phase (or recovery phase) may extend from months to years. The Late/Recovery Phase will involve continued and extensive field sampling, damage and impact assessments, and coordination of federal assistance. Considering this, there will be coordinated RFMTs from the state, county and federal level who will work collectively in the remediation of contaminated areas and restoration to pre-incident conditions and activities.

RFMT RESPONSIBILITIES

Responsibilities: The *Field Team Coordinator* at the direction of the SRMAC Director is responsible for providing direct guidance to the RFMTs. The need for sample transport and the destination of samples as well as coordinating the activity with all personnel required to complete this function will be under the direction of the SRMAC.

The *RFMTs* are responsible for performing environmental monitoring and sampling activities as directed by the Field Team Coordinator through SRMAC. The RFMTs will properly package samples, record data on appropriate records, and deliver samples to a designated location or person as directed by the SRMAC.

The *Alabama Department Environmental Management (ADEM) Laboratory* is responsible for performing radiological analyses on samples and reporting analytical results to SRMAC. The ADEM lab is located at 1350 Coliseum Blvd., Montgomery, AL 36110.

The *Alabama Department of Agriculture and Industries* will have primary responsibility for enforcement of state laws that protect the consumer and producer against inferior farm products. Personnel with the Alabama Department of Agriculture and Industries will support agriculture sampling by providing directions to locations within the state. They will also be available to identify affected crops of farm products that will be collected by the RFMT. The Department of Agriculture and Industries will enforce any condemnation or summary destruction of food crops ordered by the Alabama Radiation Control Agency.

The *Alabama Department of Public Health, Division of Food, Milk and Lodging* is responsible for milk collection samples. Milk collection samples will be performed by the Milk Inspectors. Members of the RFMT will package milk samples and prepare paperwork for transport.

RFMT GENERAL INFORMATION

General Instructions: For the early phase, all teams will be issued a map showing the area within a ten-mile radius of the plant. No RFMT will enter evacuated areas unless specifically instructed by SRMAC and then will only enter and exit evacuated areas through traffic control points. All personnel entering the evacuated areas or radiation areas must have their personal direct-reading dosimeters (DRD) and a permanent/non-direct reading dosimeter (PRD). The DRD shall be: (1) a digital alarming dosimeter (DAD) or (1) high and (1) low range pocket dosimeter. The PRD such as a TLD is to be used in conjunction with the DRD. No individual is authorized to exceed the annual occupational 5 rem Total Effective Dose Equivalent (TEDE) dose without permission from the Office of Radiation Control. The automatic turnaround value, using a survey meter with open window, is an exposure rate reading of 200 mR/hr (400 mrem/hr TEDE). The seek relief value on the DRD is 100 mR (200 mrem TEDE). The DRD should be read and recorded at least every 30 minutes in a radiation field less than 1 mR/hr and every 15 minutes in a radiation field greater than 1 mR/hr. In addition, record all DRD readings on the appropriate Radiological Field Monitoring Team Data Record and report to the Field Team Coordinator in the SRMAC (a sample is provided in manual).

The Total Effective Dose Equivalent (TEDE) can only be determined from readings by use of a multiplicative factor which is dependent upon the mix of radioisotopes in the plume. Without such knowledge, an approximation is made by use of a factor of (2*x*). That is, a DRD reading of 1 rem would give a TEDE of 2 rem. Continue to report your DRD reading. Any corrections will be made by SRMAC.

NOTE: A reading of 2.5 R on your direct-reading dosimeter (digital or pocket) equates to the 5 rem TEDE limit.

Personnel, such as inspectors with the Department of Agriculture or Division of Food, Milk, and Lodging, accompanying an RFMT during sampling should receive direction from SRMAC for issuance of appropriate dosimetry. The dosimeter readings should be recorded on a Radiation Exposure Record (a sample is provided in manual) and reported to SRMAC.

All public information releases which pertain to off-site monitoring operations will be coordinated and released by the Joint Information Center (JIC). No individual or team is authorized to make a statement to the press about off-site radiation, emergency operations, or to speculate about on-site conditions. If approached by the press, direct them to contact the JIC to be informed of the time and location of the next press conference. The JIC contact information can be obtained from the SRMAC.

INSTRUCTIONS FOR USE OF CRITICAL LINC RADIOS & RADRESPONDER

CRITICALLINC - CriticalLinc **XP5s**

- Unlock the phone by holding down the "*" key.
- Press the center button to open the "Linc PTT" app.
- Ensure you have activated the PTT service. If there is an "agreement of terms," scroll all the way down and the select "Accept."
- Press the left arrow key to go to "Groups" and use **ADPH-Rad Health AEM 77*65** to communicate.
- When NOT in use, use the right arrow to go to "Contacts" and select "**AA**" so that you do not accidentally push the button.
- To lock the phone, press the red button until it locks.

TIP: *The secondary (back-up) means of communications will be conventional cellular telephones which use a different carrier. When communication is lost, conventional cellular phones will be utilized to maintain communication with the SRMAC.*

CBRN Responder App (RadResponder)

- Sign in via personal login
- Select Event – "From My Org"
- Submit Data: Choose a Data Type – Field Survey (enter Field Survey Details).
- Submit/Save survey information via icon top right on screen.

PRE-DEPARTURE VEHICLE & EQUIPMENT GUIDANCE

(See Checklist on Back Cover)

Vehicle Set-Up

1. Verify that the zip strap is locked on the response tote prior to cutting. This guarantees all response tote contents on the list are current. (inventory sheet of supplies are on the inside top of tote)
2. Remove equipment and tarp from tote and prepare back of vehicle for contamination control. Protect back of vehicle with tarp and tape.
3. Hang a bag for trash with radiation label in the back on the driver's side. A trash bag is used for contamination control for items and disposable items (i.e., smears, gloves).
4. Place (1) ORC/ADPH decals on each side of the vehicle front doors.
5. Ensure that the primary and secondary forms of communication are operational. Secondary form of communication shall be tested by a call.
6. Line two (2) cardboard boxes with appropriate shipping labels. One box is for storage the other is for collection of environmental samples.
7. Use supplied Department identification when accessing traffic control and/or security points or locations while conducting official Department business.

Preparation of Radiological Equipment

1. Set up Ludlum Model 14C and other equipment if necessary (i.e., low range meter).
   a. Verify annual calibration due date on equipment has not expired.
   b. Physically inspect (condition) survey instrument and conduct a battery response check.
   c. Turn on audio and set toggle switch to **slow response**.
   d. Conduct an Operational check:
      i. Open the cover of the affixed check source by placing an open window probe near the check source.
      ii. Look for a visual needle deflection.
      iii. Listen for an audio response.
   e. Compare each probe with the calibration label for an acceptable range (± 20%) of readings.
   f. Cover probe(s) with plastic wrap or zip-lock bag and secure with rubber band, if needed.
   g. Take background radiation reading. Consider placing a survey meter in a 2-gallon bag.
   h. Record background readings on the Radiological Field Monitoring Team Data Record (a sample is provided in manual).
   i. Upon departure, set instrument to lowest range that provides an on-scale reading and turn response setting to **fast response**.
2. Set up Digital Alarming Dosimeter (DAD), RadEye:
   a. Check date of Calibration label affixed to unit.
   b. Press and hold the "On" key until the sound generator generates a beep.
   c. The display shows "Learning" at the top, which is finding background for location. During this time, do not expose the unit to any artificial gamma radiation. The heart symbol next to battery must be "beating". An error code will be displayed on the LCD if a problem is encountered.

d. Press Exit. Place unit for a response check near the open window (1uCi, Cs-137) check source found on Ludlum 14C. Alarm should indicate.
e. Press the "**Menu**" key and toggle to "Clear dose." Press "Yes" then "Yes" again. Press Exit.
f. Press the Info button to monitor your "dose" every 15-30 minutes.
g. Monitor your dose and record on appropriate Radiological Field Monitoring Data Record and Radiation Exposure Record.
h. Place below neckline and above the waist.

NOTE: If DAD fails its operational check, then use the (200 mR and 5R) pocket dosimeters found in the grey response case.

3. Zero and issue pocket dosimeters (200 mR and 5R), only if DAD fails its operational check.
   a. Place below neck line and above the waist
   b. Monitor your dose, and record on Radiation Exposure Record.
4. Issue a permanent dosimeter (i.e., TLD card) to each RFMT member.
   a. Record on the Radiation Exposure Record.
   b. Place below neck line and above the waist.
5. Prepare air sampler by installing cartridge and filter paper.
   a. Prepare the appropriate air sampling record (digital or rotameter).
   b. Run air sampler 5-10 seconds for operational check.
   c. Call SRMAC to report any failure or problems.

NOTE: Permanent dosimeter and direct reading dosimeters should be placed adjacent to each other.

NOTE: Prior to dispatch: Receive an initial safety briefing from SRMAC Field Team Coordinator or assigned personnel.

Radiation Exposure Record

Name:	**SS#** (last 4):		
Agency:	**DOS#:** 200	5R	Digital
Date: (MM/DD/YY)	**TLD#:**		

Note! Read dosimeter at least every 30 minutes **2023**

#	Time (24 hr)	Reading			Status (✓)		
		Low Range (mR)	High Range (R)	Digital Dosimeter	*Start*	*End*	*Total*
1	Initial						
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

Signature: _____ Date: _____

GENERAL MONITORING GUIDANCE

1. Do not enter evacuated areas unless specifically directed by SRMAC. Monitor your DRDs at 30 minutes intervals (15 mins if greater than 1 mR/hr). Approach the sectors to be monitored with the survey meter set on the lowest scale possible. Drive in an arc perpendicular to the wind direction to find the center of the plume. Do not exceed your Total Effective Dose Equivalent (TEDE = 5 rem) or your turnaround dose rate (200 mR/hr or 400 mrem/hr TEDE) unless directed by SRMAC. Take radiological readings at the center line and approximate edges of the plume and report them to SRMAC.
2. Position the covered GM probe out the window of your vehicle with the GM tube parallel to the ground with shield open facing upward and response setting on fast. While in transit to designated monitoring area set by SRMAC, observe the ambient exposure rate using the most sensitive scale to provide the first radiation measurements beyond background radiation levels. Proceed along your designated path (locations provided by the field team coordinator) and obtain peak plume measurements (centerline measurements) as well as plume-edge measurements. Record your highest radiation readings from your survey meter at designated points and/or landmarks (intersections). Once the vehicle is safely stopped and upon direction by SRMAC; take measurements at waist level (approximately 1 meter/39 inches above ground) and ground level (approximately 15 centimeters/6 inches above ground) with probe rotary window open and closed. Record all readings on the Radiological Field Monitoring Team Data Record (a sample is provided in manual) and report to SRMAC.

Note: An open probe reading of 2-3 times the closed probe readings at waist level (approximately 1 meter/39 inches) and ground level (approximately 15 centimeters/6 inches) indicates the plume is at ground level. Advise the Field Team Coordinator of the open probe and closed probe readings. An air sample may be requested at the location.

Note: Three-Way Communication: Each message must use three-way communication beginning with (1) the sender who gets the attention of the receiver; (2) the receiver receiving the message and repeating it for clarification and verification that the message was understood as intended and (3) the sender acknowledges that the receiver heard and understood the message.

3. By comparing readings to the table below determine the plume position

NOTE

Record Gamma (beta window closed) readings at waist-level (1 meter/39 inches) and ground level (15 centimeters/6 inches). Record open window readings at both heights; open window facing upwards at 1 meter/39 inches height and window open facing downward at 15 centimeters/6 inches ground level. The directional portion of the detector should be pointed upwards (away from the ground) while taking waist-level readings to avoid including beta radiation contribution from deposition on the ground in the reading.

1. By comparing readings to the table below, determine if the plume is elevated, at ground level or has passed.

If at 1 meter (39 inches)				If at 15 cm (6 inches)			**Then:**
WO		WC	**AND**	WO		WC	
β+γ	≈	γ		β+γ	≈	γ	Plume is elevated
β+γ	>	γ		β+γ	>	γ	Plume is immersing team
β+γ	≈	γ		β+γ	>	γ	Plume has passed - ground contamination

WO = detector window open; WC = detector window closed

Check dosimetry and notify FMT Coordinator if readings reach prescribed limits.

When the presence of the plume immersing the FMT is verified, air sampling is warranted at or near the plume centerline. Locating the centerline should be carried out using a survey meter with a fast response setting.

2. If directed to take an air sample, repeat open and closed window readings at beginning, middle, and end of air sample at both heights to verify RFMT was immersed by plume during entire duration of air sample.

3. Survey equipment and personnel periodically. Change gloves and dispose in labeled radiation bag as needed.

4. A GM meter reading of more than 10 times background is an indication that you are in the plume. The windows and the outside ventilation of your vehicle should be closed. Notify the Field Team Coordinator in SRMAC.
5. Decision criteria for release of personnel, vehicles, equipment and surfaces are based on a contamination limit of 2*x* (twice) background radiation level. A detector using a pancake GM or appropriate scintillator should be used in determining surface contamination. Move the probe within ½ to 1 inch of surface at a rate of 1 inch per second. Personnel or items exceeding contamination limits of 2*x* background radiation should be reported to SRMAC.
6. Report monitoring results to SRMAC in the following frequency, unless otherwise directed by SRMAC:

Whole Body Exposure Rate (mR/hr)		
If levels are:	**Take Readings every:**	**Report Readings to SRMAC**
Less < 1 mR/hr	**30 minutes**	**As taken**
Greater > 1 mR/hr	**15 minutes**	**As taken**

TOTAL EFFECTIVE DOSE EQUIVALENT (TEDE)

In Alabama, the following administrative limits will be used to address the radiation limits for emergency workers entering a plume during a radiological emergency involving a nuclear power plant:

> *The administrative limit is stated in terms of the external dose measured by a DRD (digital or pocket). There is currently no method available to assess internal exposure on a real-time basis. To account for the internal dose, which cannot be measured prior to or during a mission**, the internal dose is assumed to be equal to the external dose as measured by the direct-reading dosimeters (digital or pocket).***

Therefore, an administrative default correction factor of two (2*x*) to relate external dose to internal dose will be used.

A simplified version of the Total Effective Dose Equivalent (TEDE) can be stated as follows:

TOTAL DOSE = EXTERNAL DOSE + INTERNAL DOSE

OR

TOTAL DOSE = 2*x* DIRECT READING DOSIMETER (DRD)

RADIATION DOSAGE LIMITS

(APPLICABLE ONLY FOR RADIOLOGICAL FIELD MONITORING TEAMS)

The administrative limit for emergency workers in Alabama has been set at one-half the limit for each class of activity recommended by the EPA.

RADIOLOGICAL FIELD MONITORING TEAMS
Radiation Dosage Limits
TEDE (Total Effective Dose Equivalent)

Environmental monitoring and locating airborne releases

	TEDE	Meter/DRD
Turn Around Value (Dose Rate)	400 mrem/hr	200 mR/hr
Seek Relief (Digital or Pocket Dosimeter)	200 mrem	100 mR
Daily Maximum	1 rem	500 mR
MAXIMUM for ACCIDENT	5 rem	2.5 R
Evacuating Known Residents	10 rem	5 R
Life Saving	25 rem	12.5 R

Alabama Radiation Control — Current as of 2023

- **Read and record all (DRD) direct-reading and/or digital alarming dosimeter measurements (DAD) at least every 30 minutes.**
- Automatically seek to relief if exposure rate is 200 mR/hr using 44-38 probe (open window) with survey meter. Then call SRMAC.
- **Do not exceed 2.5 R on your DRD (Annual Occupational Limit is 5 rem TEDE).**
- An open probe reading of 2-3 times the closed probe reading at 1 meter *and* 6 inches indicates a touchdown of the plume at that location.
- **During the air sample, take radiation field measurements before, during, and after sampling; record measurements.**
- Contamination level for samples and personnel monitoring is twice (2x) background.
- **Samples with a contact radiation level greater than 1 mR/hr may only be shipped with express written permission from SRMAC.**
- Decontamination stations are the Houston County Farm Center for Farley and Priceville Junior High School for Browns Ferry.
- **RFMTs will use "ADPH-Rad Health AEM 77*65" on the CriticalLinc unless otherwise directed by SRMAC.**
- Establish contact with SRMAC at least every 30 minutes.
- **RadEye (DAD: Digital Alarming Dosimeter): Install batteries and power on. Unit performs continuous self-checks and if failure is indicated on the LCD then use pocket dosimeter(s). Conduct a response check using the check source found on Ludlum and then clear dose.**

Alabama Radiation Control — Current as of 2023

RADIOLOGICAL FIELD MONITORING TEAM DATA RECORD
Digital Alarming Dosimeter (Primary)

FMT CALL SIGN:		GMSM Info. →	Model:	Serial No.:	Calibration Date:
FMT MEMBERS:	Name #1:		Name #2:		
Date:		Background Readings →	Pancake probe: (cpm)	HP probe: (mR/hr)	08/2021

DATA RECORD

1	2	3	4	5	6	7	8
Location/GPS	Time	1 meter/39"		15 cm/6"		**Digital Dosimeter Readings** ***Record at least every 30 minutes***	
						Range: 1 µR – 10 R	
		w/o	w/c	w/o	w/c	RFMT Member #1	RFMT Member #2

RADIOLOGICAL FIELD MONITORING TEAM DATA RECORD

Pocket Dosimeters (Back-up)

FMT CALL SIGN:	GMSM Info. →	Model:	Serial No.:	Calibration Date:
FMT MEMBERS:	Name #1:		Name #2:	
Date:	Background Readings →	Pancake probe: (cpm)	HP probe: (mR/hr)	08/2021

DATA RECORD

1	2	3	4	5	6	7	8	9	10
Location/GPS	Time	1 meter/39"		15 cm/6"		Pocket Dosimeter Readings *Record at least every 30 minutes*			
						200 mR		5 R	
		w/o	w/c	w/o	w/c	FT#1	FT#2	FT#1	FT#2

ENVIRONMENTAL SAMPLING TECHNIQUES

Take air, milk, water, soil, and vegetation samples as directed by the SRMAC in accordance with sample requirements. For all sample locations, a gamma exposure rate (window closed) reading should be taken at waist level (approximately 1 meter/39 inches) and above surface (approximately 15 centimeter/6 inches) of the ground. Record readings on the Sample Identification Label and Radiation Analysis Request & Sample Chain-of-Custody Record (a sample is provided in manual). A location description (degrees and miles or Global Positioning System) should be made for each sample site and recorded on appropriate records. For sample sites, place a large bag (ground cover) on the ground for equipment in order to minimize contamination. Environmental samples will be delivered to an environmental laboratory that has been designated by the SRMAC.

Sample Requirements:

Air: Plume air sample using an air sampler followed by a charcoal or silver zeolite cartridge. Charcoal filter cartridge is used for training and exercises, while the silver zeolite cartridge is used only for a real event. Count the particulate filter paper and cartridge, then place each sample in a separate sealable bag. Both samples are then placed in another separate sealable bag. Report the iodine air concentration to SRMAC.

Milk: 1 quart minimum (≈946 milliliters), Plastic container. Add (≈10 milliliters or 6 caps full) of formaldehyde as a preservative, if unavailable, use three (3) caps full of rubbing alcohol. Place in a sealable bag.

Soils: Take (2) 100 cm^3 (4” x 4”) soil samples at 2 cm (≈1”) deep and place in a sealable bag.

Vegetation: Loosely fill a sealable 2-gallon bag with vegetation. Collect vegetation from an area about 1 m^2 (≈10 square feet), unless otherwise specified. Place in another sealable bag.

Water: 1 quart minimum (≈946 milliliters), Cubitiere. Do not overfill, place in a sealable bag.

Label: Each sample shall be tagged with a s*ample identification label (*a sample is provided in manual). Request a sample identification number from the SRMAC Field Team Coordinator (e.g., FNP-01 or BFNP-01).

Complete**:** Radiation Analysis Request & Sample Chain-of-Custody Record.

Radiation Readings taken Above Ground:

15 cm/6”: Take a gamma exposure rate (window closed) reading using HP probe at approximately 15 centimeters/6 inches above the surface of the ground.

1 m/39”: Take a gamma exposure rate (window closed) reading using the HP probe at approximately waist-level (1 meter/39 inches).

Radiation Readings of Sample Package:

Contact: Take a gamma exposure rate reading using HP closed probe on contact of the sample package.

Swipe: Take a 100 cm² (area of a dollar bill) swipe of the outer package surface. Use a pancake probe to check for loose surface contamination at twice (2*x*) background level.

SAMPLE IDENTIFICATION LABEL

Sample ID: _____
Collected by: _____
Date: _____ **Time:** _____
Location: _____
Media Type: Air ☐ Milk ☐ Water ☐ Soil ☐
Vegetation ☐ Other ☐ _____
For Air Samples: Flow Rate: _____
Filter Type: _____
Collection Time: _____
For Milk Samples: _____
Preservative Used: _____
Radiation readings taken of sample package:
Contact: _____ mR/hr
Swipe: _____ cpm
Radiation readings taken above ground:
15 cm/6″: _____ mR/hr
1 m/39″: _____ mR/hr

AIR SAMPLING GUIDANCE

The purpose of air sampling is to collect a sample of air on an appropriate media to determine airborne hazards. In a nuclear power event, the collection of radioiodine and particulate air samples are to be taken downwind from sites of potential airborne radioactive releases.

A high volume sampler consists of two parts: the pump and the filter holder assembly. The entire assembly is removable, but radiological field team members are instructed to remove only the black or blue filter holder. In most cases, a paper filter and a charcoal or silver zeolite cartridge are to be used together.

NOTE: Conduct an Operational Check for all air samplers prior to departure. Run sampler for approximately 5-10 seconds. For problems or questions, contact SRMAC.

The air sampler should be positioned upwind from the motor vehicle facing forward and away from the exhaust with the car running. Place the air sampler on a level surface out front of the engine or place air sampler on top of the hood. Do not place the air sampler on the ground. The air intake should be facing the source of release.

NOTE: Radiological exposure rate measurements should be taken before, during and after air sampling and recorded in the designated area on the air calculation record.

1. Fill out the **sample identification label** for each sample.
2. Label Sample ID (BFNP or FNP–001). Numbers are to be assigned to RFMT members by SRMAC.
3. Take a gamma exposure rate reading at 1 meter/39” and 15 cm/6”. Record on sample identification labels.
4. To insert a filter, remove filter holder from the air sampler. Remove the outer clamp ring by turning counterclockwise. Place filter paper on the grid of the filter holder. Be sure that it is centered ***(rough side facing out)*** and replace filter clamp ring *(hand tighten*).
5. Place the charcoal or silver zeolite cartridge inside the center filter holder. *Be* sure that the **arrow** on the side of the filter cartridge points toward the pump. Replace filter holder to air sampler.
6. Take exposure rate measurements before, during, and after air sample.
7. Turn on the air sampler, wait for the flowrate to stabilize within the operating range. Record the flow rate, time start and stop. F&J digital air samplers are preset for volume.
8. After sample has been collected, place air sampler in a lined collection box. Move to a background radiation area.
9. Count the cartridge with pancake probe and place in a sealable bag.
10. Count the particulate filter paper with pancake probe and place in a sealable bag.
11. Record two separate samples on the Radiation Analysis Request & Sample Chain-of-Custody record. Place each sample in its own separate sealable bag.
12. Take a 100 cm² swipe (area of a dollar bill) of second bag to verify contamination level is less than twice (2*x*) background and record on sample identification label.
13. Dispose of swipe sample in a labeled radiation bag as radioactive waste.
14. Take a on contact gamma exposure rate reading on the outer bag and record on the sample identification label.
15. Complete the air calculation record, and report the iodine concentration to SRMAC.

F&J Digital Emergency Air Samplers

1. Open air sampler unit and press the **Charge Indicator** button to determine the level of charge the air sampler battery has. There is approximately 18-20 hours of operating time with a full charge. Alternatively, the air sampler can be powered using a 100VAC line power or a 12VDC vehicle battery power.
2. The air sampler is programmed to collect a minimum of 10 cubic feet (ft^3).
3. Press the **On/Off** button to place sampler in stand-by mode. The LED indicator will be lit.
4. Set all values to zero (0). Press the **Units** button until the green LED is lit beside "time". Press **RESET** to set to zero (0). Press **Units** button until green LED is lit beside "total volume". Press **RESET** to set to zero (0).
5. Press the **Units** button until green lit is beside "flow". Press **RESET** to start collection. Record start time on air calculation record when the rate has stabilized and the lid is closed.

   *NOTE: You can toggle between **Flow**, **Time** and **Total Volume** by pressing **Units** button. If you press **Reset** while indicator is beside a specific unit other than **Flow**, that value will reset to zero (0). If you press **Reset** while the indicator is beside **Flow**, collection will stop and the sampler will go into stand-by mode.*

6. The air sampler will automatically turn off when a minimum of 10 cubic feet (ft^3) is collected.
7. Take a gamma exposure rate reading at 1 meter/39" and 15 cm/6". Record on sample identification labels.
8. Press "On/Off" button to turn the air sampler off. Place air sampler in a lined collection box.
9. Record stop time, calculate/record number of minutes ran, and 10 ft^3 for total sample volume on the Air Calculation Record for digital air samplers (a sample is provided in manual).
10. After sample has been collected, move to a background radiation area, and prepare the samples as prescribed above for counting and packaging.
11. Count the cartridge and place in a sealable bag. Affix a sample label.
12. Count the particulate filter and place in a sealable bag. Affix a sample label.
13. Record two separate samples on the Radiation Analysis Request & Sample Chain-of-Custody record. Place each sample in its own separate sealable bag.
14. Take a 100 cm^2 swipe (area of a dollar bill) of each second bag to verify contamination levels are less than twice (2*x*) background and record on sample identification label.
15. Dispose of swipe in a labeled radiation bag as radioactive waste.
16. Take a on contact gamma exposure rate reading on the outer bag and record on the sample identification label.
17. The RFMT should then complete the air calculation record and report the iodine concentration to SRMAC.

AIR CALCULATION RECORD – DIGITAL AIR SAMPLER

FMT CALL SIGN			Air Sampler Model/Serial #	Model	Serial #
FMT MEMBERS			Air Sampler Calibration Date		
DATE	LOCATION Degrees/Miles/GPS			TIME	12/2015

DATA RECORD									
1	2	3	4	5		7	8	9	10
Bkg (air outside the plume)	Particulate Paper Filter		Iodine Cartridge			Flow			
	Gross	Net (Column 2-1)	Gross (front)	Net (Column 4-1)		Start Time	Stop Time	# of Minutes	Total
CPM	CPM	CPM	CPM	CPM				MIN	FT^3

Conversion Factor	1×10^{-9} $\frac{uCi}{CPM} \times \frac{FT^3}{CM^3}$	
Iodine Concentration (Air)	**Column 5 / Column 10**	**X 10^{-9} uCi/CC**

Exposure Rate Data	*Before Air Sample*				*During Air Sample*				*After Air Sample*			
mR/hr	1 meter/39"		15 cm/6"		1 meter/39"		15 cm/6"		1 meter/39"		15 cm/6"	
	w/o	w/c	w/o	w/c	w/o	w/c	w/o	w/c	w/o	w/c	w/o	w/c

Note: 3000×10^{-9} uCi/CC (I-131) for 1 hour causes an adult thyroid dose commitment of 1 rem.

MILK SAMPLING GUIDANCE

The purpose of milk sampling is to prevent milk and milk products containing excessive amounts of radioactivity from being used for human consumption. The primary concern is iodine which will be the limiting radionuclide in milk in a release from a nuclear power plant. Personnel from the Milk Branch of the Division of Food, Milk, and Lodging will specify and collect samples of milk from dairies. The RFMT will provide equipment for milk collection and will package for transport.

> ***NOTE: Consult with dairy farmer for documentation of the volume of milk in the storage tank being sampled and for date and time when each milking was added to the tank. Note if livestock (cow or goat) were on stored feed or pasture.***

1. Fill out the **sample identification label** for each sample.
2. Label Sample ID (BFNP or FNP–001). Numbers to be assigned to RFMT.
3. Take a gamma exposure rate reading at 1 meter/39" and 15 cm/6". Record on sample identification label.
4. Collect 1 quart (≈ 946 milliliters) sample. Do not overfill.
5. Add approximately 10 milliliters (6 caps full) of formaldehyde as a preservative. If not available, then add three (3) caps full of rubbing alcohol.
6. Place sample in a sealable bag (sample container is considered as the first bag).
7. Take a 100 cm^2 swipe (area of a dollar bill) of the second bag to verify contamination levels are less than twice (2*x*) background and record on sample identification label.
8. Dispose of swipe in a labeled radiation bag as radioactive waste.
9. Take a on contact gamma exposure rate reading on the outer bag and record on sample identification label.
10. Complete Radiation Analysis Request & Sample Chain-of-Custody record.

SOIL SAMPLING GUIDANCE

The purpose of soil sampling is to determine surface contamination at a location and/or site. In order to collect a representative soil sample, choose soil that is relatively dry and is in a flat location. Do not sample under trees, bushes, or other overhanging objects. The most important variable is the surface area of the sample. The depth of the sample is also important, as all activity is deposited on the surface of the soil and unnecessary depth will dilute the sample results.

1. Fill out the **Sample Identification Label** for each sample.
2. Label Sample ID (BFNP or FNP–001). Numbers to be assigned to RFMT.
3. Take a gamma exposure rate reading at 1 meter/39" and 15 cm/6". Record on sample identification label.
4. Use stainless steel soil sampling tool (2 pieces) to take two (2) samples beside one another.
5. Press sampling tool into the soil (use rubber mallet, if needed to tamp down) to a depth of 2 centimeters (≈1") and slide pan underneath to collect sample.
6. Hold open a sealable bag (opening folded over gloved fingers) and deposit soil sample. Repeat for a total of two soil samples.
7. Place each sample in a second sealable bag (each sample should be double bagged separately).
8. Take a 100 cm² swipe (area of a dollar bill) on the outer bag to verify contamination levels are less than twice (2*x*) background and record on sample identification label.
9. Dispose of swipe in a labeled radiation bag as radioactive waste.
10. Take a on contact gamma exposure rate reading on the outer bag and record on sample identification label.
11. Complete Radiation Analysis Request & Sample Chain-of-Custody record.

VEGETATION SAMPLING GUIDANCE

The purpose of vegetation sampling is to determine surface contamination at a location and/or site. Do not sample under trees, bushes, or other overhanging objects. The most important variable is the surface area of the sample. The Department of Agriculture and Industries personnel will support the State Radiation Control Agency in the location of farms within the state. Agriculture personnel will identify vegetation (food crops) to be collected by the RFMT for ingestion sampling.

1. Fill out the **Sample Identification Label** for each sample.
2. Label Sample ID (BFNP or FNP–001). Numbers to be assigned to RFMT.
3. Take a gamma exposure rate reading at 1 meter/39” and 15 cm/6”. Record on sample identification label.
4. Cut vegetation using a Hawk Bill or appropriate tool from an area about 1 m² (≈10 square feet).
5. Loosely fill a sealable 2-gallon bag.
6. Place sample into another sealable bag.
7. Take a 100 cm² swipe (area of a dollar bill) on the outer bag to verify contamination level are less than twice (2*x*) background and record on sample identification label.
8. Dispose of the swipe in a labeled radiation bag as radioactive waste.
9. Take a on contact gamma exposure rate reading on the outer bag and record on sample identification label.
10. Complete Radiation Analysis Request & Sample Chain-of-Custody record.

WATER SAMPLING GUIDANCE

The purpose of water sampling is to determine concentrations of various radionuclides dissolved or suspended in a water column. Water samples should be collected in open areas and not sheltered by trees or high bushes. Avoid areas of high turbidity or high sediment. Avoid stirring up sediment and including it in the sample. Sampling buckets should not be allowed to sink to the bottom. Choose a location with minimal turbidity and little or no vegetative debris. This material can bias the true activity concentrations of the collected water sample.

NOTE: Do not take water samples from recirculating water troughs.

1. Fill out the **Sample Identification Label** for each sample.
2. Label Sample ID (BFNP or FNP–001). Numbers to be assigned to RFMT.
3. Take a gamma exposure rate reading at 1 meter/39” and 15 cm/6”. Record on sample identification label.
4. Set the sample container on a stable location with the funnel inserted in the opening.
5. Lower the collection apparatus (dipper or bucket) into the water column ensuring not to disturb sediment and aquatic vegetation.
6. Collect one quart (≈ 946 milliliters) sample and place in cubitiere. Do not overfill.
7. Place cubitiere into a sealable bag (the cubitiere will act as the second bag).
8. Take a 100 cm² swipe (area of a dollar bill) on the outer bag to verify contamination level are less than twice (2*x*) background and record on sample identification label.
9. Dispose of the swipe in a labeled radiation bag as radioactive waste.
10. Take a on contact gamma exposure rate reading on the outer bag and record on sample identification label.
11. Complete Radiation Analysis Request & Sample Chain-of-Custody record.

PACKAGING, TRANSPORT AND TRANSFER OF EMERGENCY ENVIRONMENTAL SAMPLES

Purpose: To provide instruction for packaging, transporting, and transferring environmental samples to the Alabama Department of Environmental Management Laboratory (ADEM) or other laboratories, to determine levels of residual radioactivity in the environment and in food products because of radioactive contamination.

Scope: This procedure is applicable to all State of Alabama personnel and all personnel under the control and/or supervision of the State of Alabama during radiological field monitoring resulting from a significant release of radioactivity from a nuclear power plant in or affecting the State of Alabama.

Required Equipment, Documentation, and References

Required Equipment Per Team: (1) Automobile, (1) 10-mile and/or 50-mile Map, (2) Totes with supplies (Black and Grey), (1) Ludlum 14C kit, (1) Ludlum 9DP (pressurized ion chamber; issued during ingestion or actual event), (2) Cardboard Boxes for contaminated equipment and samples, (1) Air sampler, (1) Radio, (1) Cellular phone and (1) Global positioning system (GPS).

Documentation: Radiological Field Monitoring Team Data Record(s), Air Calculation Record(s), Radiation Analysis Request and Sample Chain-of-Custody Record(s), Sample Identification Label(s) and Radiation Exposure Record(s).

References: Alabama Radiological Emergency Preparedness (REP) Plan and the State of Alabama Radiological Field Monitoring Team Manual.

Limits and Precautions: All Radiological Field Monitoring Team members must be properly trained and qualified to perform all radiological field monitoring activities including packaging and transport of samples.

NOTE: Contamination levels on the outside of samples must be less than twice (2x) background.

Radiation Surveys:

1. Direct radiation measurements of samples will be performed using a GM survey meter with an energy-compensated beta-gamma probe (HP Probe) or Ludlum 9DP.
2. Contamination surveys will be performed using a GM survey meter with a pancake probe. Measurements will be made by taking a 100 cm^2 swipe (area of a dollar bill) on the outside (outer bag) of each sample.
3. Each environmental sample collected shall have a sample identification label affixed to the outside of the outer bag. Information from the sample label shall be used to complete to the Radiation Analysis Request & Sample Chain-of-Custody Record.

Sample Transport:

Samples should be transported to the ADEM Environmental Laboratory at the end of each day unless directed differently by SRMAC. If earlier sample transport is required, arrangements will be made by the Field Team Coordinator under the direction of the SRMAC Director, and the team(s) will be advised of the sample transfer point to be used.

Packaging Samples for Transport:

1. Samples are to be bagged and surveyed. Direct radiation measurements of samples will be performed using a GM survey meter with an energy-compensated beta-gamma probe or a Ludlum 9DP. Radiation exposure rate measurements will be made of each sample on contact with the outside of each sample package. For all sample locations, a gamma exposure rate (window closed) reading should be taken at waist-level (1 meter/39 inches) and ground level (15 centimeters/6 inches). Radiation measurements should be recorded on the Sample Identification Label and transferred to the Radiation Analysis Request & Sample Chain-of-Custody Record. Once sampling activities are completed by the RFMT, environmental samples are to be placed in a durable, plastic-lined shipping container with a properly affixed label.

2. Contamination surveys will be performed on each sample using a GM survey meter with a pancake-type probe. Measurements will be made by taking a 100 cm^2 swipe (area of a dollar bill) on the outside of each sample to verify contamination levels are less than twice (2*x*) background. If greater than twice (2*x*) background, attempt to decontaminate by using a damp wipe first, then resurvey for less than twice (2*x*) background. Place in an additional bag (third bag) as a secondary measure to cover contamination and annotate on packaging “inner bag contaminated”. For problems on decontamination of samples, call SRMAC. Measurements will be recorded on the Sample Identification Label and transferred to the Radiation Analysis Request & Sample Chain-of-Custody Record. Dispose of gloves, decontamination materials, and swipe surveys in a labeled radiation bag as radioactive waste.

3. All samples are to be double bagged and surveyed for removable contamination. Attach the sample identification label to the sample by folding the adhesive label over the opening of the outer bag.

4. Place environmental sample(s) as they are collected into a durable, plastic-lined shipping container (box) and transfer data from the sample identification label to the Radiation Analysis Request and Sample Chain-of-Custody form. When sampling activities are complete, seal the inner plastic bag followed by taping closed the shipping container.

5. Perform (3) 100 cm^2 swipes, covering a total area of 300 cm^2 (area of 3 one-dollar bills) on the external surface of the shipping container to verify contamination levels are less than twice (2*x*) background. If activity of external surface of the shipping container is greater than twice (2*x*) background, re-box the sample and resurvey less than twice (2*x*) background prior to transport. Dispose of swipe surveys and contaminated box (if applicable) in a labeled radiation bag as radioactive waste.

7. Verify the dose rate, using the HP (open window) probe, on the external surface of the shipping container does not exceed 0.5mR/hr.

8. Prepare the shipping container for shipment as “Limited Quantity Radioactive Material”.

9. Place the following label on the outside of the shipping container (Radioactive shipping labels can be found in the expandable folder located in the supply box):

Note: Assuming a representative mix of radionuclides following an incident at a nuclear power plant, up to one hundred (100) individual samples may be shipped in a single container as “Limited Quantity”.

RADIOACTIVE

Consignee:

Consignor: Alabama Department of Public Health

This package conforms to the conditions and limitations specified in 49CFR173.421 for excepted radioactive material, limited quantity, N.O.S. UN 2910; 49CFR173.422 for excepted radioactive material, instruments and articles manufactured from natural or depleted uranium or natural thorium, UN2909; or 49CFR173.427 for excepted radioactive material; empty packages, UN2908.

Note: Samples with a contact radiation level greater than 1 mR/hr may only be shipped with express written permission from the SRMAC Director.

Sample Transportation:

1. When samples are picked up by the courier or turned in by the RFMTs, the Radiation Analysis Request and Sample Chain-of-Custody Record will be updated and signed off each time the sample changes possession. The Radiation Analysis Request and Sample Chain-of-Custody Record is in four (4) duplicates, and a copy shall to be retained by each party.

2. When the samples are picked-up or transported from the field, the samples should be taken to the ADEM laboratory or lab designated by SRMAC.

3. SRMAC shall secure the services of an enclosed vehicle to transport samples.

4. Place the sample container into the transport vehicle as far away from the operator as is reasonably achievable.

5. Upon the arrival at the designated lab, the field team or operator should relinquish the sample container to the lab personnel by completing the Radiation Analysis Request & Sample Chain-of-Custody Record.

RADIATION ANALYSIS REQUEST & SAMPLE CHAIN-OF-CUSTODY RECORD

Single Source/Facility – Multi-Sample Locations

Laboratory: ☐ ADEM Central (MGY) ☐ Other _____

Collector: _____ Project _____ Fund 998

Source (Facility) _____ City/State _____ County_____

☐ Split Samples

Sample ID	Collect Date/Time m/dd/yy 24hr	Container (Bag, Jug, Marinella, cubitainer)	Sample Type (Composite, Grab)	Preservative (None, Iced, formaldehyde)	Media Type (Soil, Water, Milk, Air, Vegetation)	Parameters (See bottom for List)	Lab Staff Only		
							Lab ID#	Temp c^0	Iced (y/n)

SAMPLE(S) COLLECTED BY (Signature) RELINQUISHED BY (Signature) DATE/TIME

RECEIVED BY (Signature) DATE/TIME RELINQUISHED BY (Signature) DATE/TIME

RECEIVED BY (Signature) DATE/TIME RELINQUISHED BY (Signature) DATE/TIME

RECEIVED BY (Signature) DATE/TIME (Signature) (If samples are checked in by person other than person recieving sample)

Send Report to: **ALABAMA RADIATION CONTROL**

CONTAMINATION MEASUREMENTS

Sample ID must match the Sample ID listed in the table above.

SAMPLE ID	Location or GPS: Latitude/Longitude	Exposure Rate Above Ground @1m/39" **(mR/hr)** @15cm/6"		Sample Package Survey @ Contact (mR/hr) of sample	Sample Package Survey Swipe cpm/100cm^2 of sample

PARAMETERS

Gross Alpha & Beta (EPA 900.0)
Gamma (EPA 901.1) *
*milk, air, soil, water, vegetation
Gross Beta Air (EPA 900.0)

Radium 228, Radium 226 (EPA 904.0)
Strontium-89, Strontium-90 (EPA 905.0)
Tritium (EPA 906.0)
Uranium (908.0)

FOD 1-Form 30E 12/08/2015

MONITORING FOR CONTAMINATION GUIDANCE

1. When leaving an area of suspected contamination, an assessment of contamination should be made. At the first opportunity, after leaving the area, a survey of the vehicle should be made and recorded on the Vehicle Monitoring/Decontamination Record (a sample is provided in manual). If these readings are greater than twice (2x) background, then personnel monitoring will be necessary.

2. To check individuals for contamination, use a survey meter with a GM pancake detector. The toggle switch should be set for fast response. Position the pancake probe from the surface in question (½ to 1 inch away at a rate of 1-2 inches per second) to frisk for contamination. Work systematically over the entire surface of the team member's body (check bottom of shoes) and record on the Personnel Monitoring/Decontamination Record (a sample is provided in manual). Special attention should be given to body orifices and areas covered with hair.

   Unless otherwise directed by the SRMAC Director, a sustained instrument reading (shield open) of twice (2*x*) background will be sufficient to warrant decontamination.

3. When either vehicle or individuals are found to be contaminated, contact SRMAC which will direct the radiological field team to the appropriate station for decontamination. The decontamination stations for Emergency Workers are listed below for the respective Nuclear Power Plant:

Farley Nuclear Plant	**Browns Ferry Nuclear Plant**
• Houston County Farm Center 1701 East Cottonwood Highway Dothan, AL	• Lauderdale County High School 201 Cedar Street Rogersville, AL • Moulton Recreation Center 13550 Court Street Moulton, AL • Decatur FD/PD Training Center 4119 Old US Highway 31 Decatur, AL • Ardmore High School 30285 Admore Avenue Ardmore, AL • Elkmont High School 25630 Evans Avenue Elkmont, AL

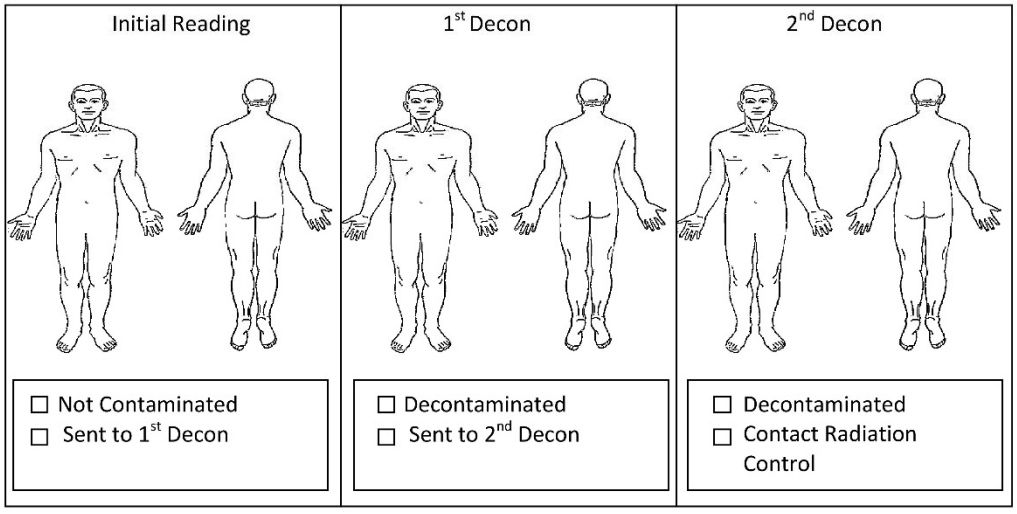
THYROID UPTAKE LIMITS FOR INDIVIDUALS = 5 rem

Personnel Monitoring/Decontamination Record

PERSONNEL MONITORING/DECONTAMINATION RECORD			
PERSONAL INFORMATION			
Name:			SSN:
Address:			Sex: M/F
City:	State:	Zip Code:	Phone#:
Reception Center:			Date:

THYROID DOSE		
Ludlum 14C (multiply CPM x .04)	Adult Thyroid Uptake Limit - 5,000 mRem (5 Rem) NOTE: If reading ≥ 5 rem, escort individual to hospital for internal decontamination.	
Initial Reading: _____ mRem	Following 1st Decon: _____mRem	Following 2st Decon: _____mRem

EXTERNAL CONTAMINATION			
Note: Contamination Limit in Alabama is 2 x Background		Background Reading: _____CPM	
Area of Contamination (Indicate Location on Diagram Below)	Initial Reading (Hairline x Dial)	Reading Following 1st Decon	Reading Following 2nd Decon
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			



Monitor's Signature

Decon Monitor's Signature

JUL16

Vehicle Monitoring/Decontamination Record

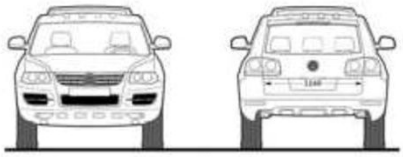
VEHICLE MONITORING/DECONTAMINATION RECORD				
Name:				**Date:**
Address:				**Phone#:**
City:		**State:**	**Zip Code:**	
Year:	**Make:**	**Model:**	**Color:**	**Tag:**

NOTE: Contamination Limit in Alabama is 2 X Background
Initial survey of vehicle:

Background Reading: ____CPM

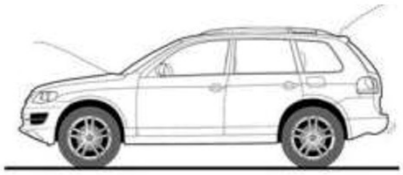
(Indicate the Location)

Front Bumper
_____CPM



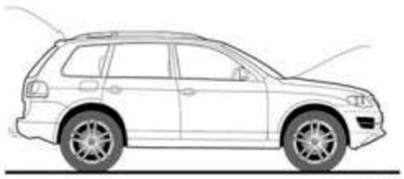
Rear Bumper
_____CPM

Driver's Side
Tire/Wheel Well
(Front)
_____CPM
(Rear)
_____CPM



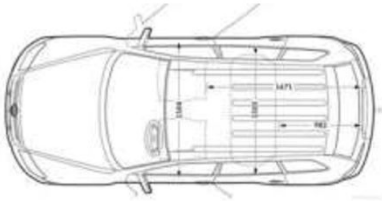
Driver's Side
Door Handles
(Front)
_____CPM
(Rear)
_____CPM

Passenger's Side
Tire/Wheel Well
(Front)
_____CPM
(Rear)
_____CPM



Passenger's Side
Door Handles
(Front)
_____CPM
(Rear)
_____CPM

Roof
_____CPM



Interior Area(s)
Steering Wheel _____CPM
Seat(s) _____CPM
Floorboard _____CPM

Remarks

_____ _____

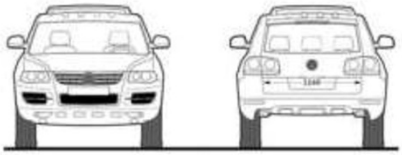
Monitor's Signature Decon Monitor's Signature

JUL16

Vehicle Monitoring/Decontamination Record

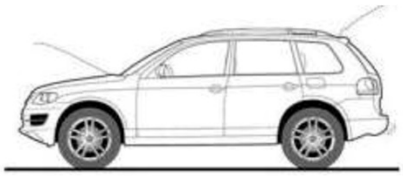
Decontamination of vehicle:

Front Bumper
1st Decon _____CPM
2nd Decon _____CPM



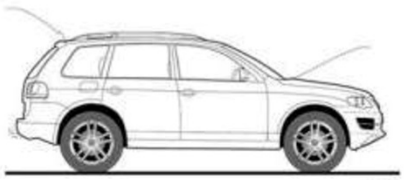
Rear Bumper
1st Decon _____CPM
2nd Decon _____CPM

Driver's Side -Tire/Wheel Well
(Front)
1st Decon _____CPM
2nd Decon _____CPM
(Rear)
1st Decon _____CPM
2nd Decon _____CPM



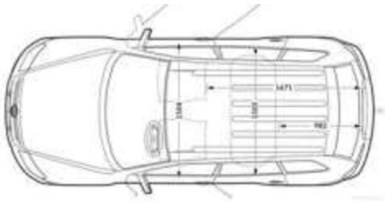
Driver's Side-Door Handles
(Front)
1st Decon _____CPM
2nd Decon _____CPM
(Rear)
1st Decon _____CPM
2nd Decon _____CPM

Passenger's Side-Tire/Wheel Well
(Front)
1st Decon _____CPM
2nd Decon _____CPM
(Rear)
1st Decon _____CPM
2nd Decon _____CPM



Passenger's Side- Door Handles
(Front)
1st Decon _____CPM
2nd Decon _____CPM
(Rear)
1st Decon _____CPM
2nd Decon _____CPM

Roof
1stDecon _____CPM
2ndDecon CPM



Interior Area(s)
1stDecon:
Steering Wheel _____CPM
Seat(s) _____CPM
Floorboard _____CPM
2ndDecon:
Steering Wheel _____CPM
Seat(s) _____CPM
Floorboard _____CPM

NOTE: In event that after the 2nd attempt to decon still remains above the established contamination limit, isolate vehicle and contact Radiation Control.

METHOD OF DECONTAMINATION:
- ☐ Wipe inside with damp cloth
- ☐ Vacuum floor boards
- ☐ Wash outside with soap and water

FURTHER ACTION REQUIRED:
- ☐ Decon complete. Refer to Clean Parking Area
- ☐ Further Decon required. Refer to Secured Parking Area

Remarks

_____ _____

Monitor's Signature Decon Monitor's Signature

JUL16

NUCLEAR POWER PLANT EMERGENCY CLASSIFICATIONS

Notification of Unusual Event (NOUE):

Events are in the process or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No release of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

Alert:

Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of EPA Protective Action Guideline exposure levels.

Site Area Emergency:

Events are in process or have occurred which involve an actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of plant functions; or (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.

General Emergency:

Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more that the immediate site area.

KEY TO STABILITY CATEGORIES

A - Extremely unstable conditions
B - Moderate unstable conditions
C - Slightly unstable conditions
D - Neutral conditions*
E - Slightly stable conditions
F - Moderately stable conditions
G - Extremely Stable

Surface Wind Speed (at 10 m)***		Daytime Conditions (insolation)			Night Conditions (cloudiness)	
mph	m/sec	Strong (sunny)	Moderate (partly cloudy)	Slight (very cloudy)	Thin Overcast or ≥ 4/8 (Cloudiness)**	≤ 3/8 (Cloudiness)
<4.5	<2	A	A-B	B	F	G
4.5 to 6.7	2 to 3	A-B	B	C	E	F
6.7 to 11.1	3 to 5	B	B-C	C	D	E
11.1 to 13.4	5 to 6	C	C-D	D	D	D
>13.4	>6	C	D	D	D	D
The class D should be assumed for heavy overcast conditions during day or night.						

Applicable to heavy overcast, day or night.

****The degree of cloudiness is defined as the fraction of the sky above the local apparent horizon which is covered by clouds.***

*****1 mile per hour (mph) x 0.447 = meter/second (m/sec)***
1 meter/second (m/sec) x 2.236 = mile/hour (mph)

USE OF POTASSIUM IODIDE

Potassium Iodide (KI) should be taken in dosage of 130 mg by all members of the Radiological Field Monitoring Teams if any of the following applies:

1. ***Orders from the State Health Officer*** or designee through the SRMAC field team coordinator.

2. ***An iodine concentration of 3000 x 10^{-9} uCi/CC*** calculated using silver zeolite cartridge in air sample measurement. Consult with SRMAC prior to ingestion.

The following page discusses potassium iodide side effects. If KI is to be taken by an individual serving on or with a RFMT, then sign the informed consent record and keep the bottom copy for your record. The original (top copy) shall be returned to SRMAC.

CONSENT FORM

Evacuation Zone

HOW POTASSIUM IODIDE (KI) WORKS

In a radiation emergency, radioactive iodine may be released into the air. This material may be breathed in or swallowed. It may enter the thyroid gland and damage it.

If you take potassium iodide, it will saturate your thyroid gland with nonradioactive iodine. This reduces the chance that harmful radioactive iodine will be absorbed by the thyroid gland.

SIDE EFFECTS

Possible side effects include swelling of the salivary glands or various parts of the body, "iodism" (metallic taste, burning mouth and/or throat), sore teeth and gums, symptoms of a head cold, and sometimes diarrhea, nausea, vomiting, or a stomach ache.

A few people have an allergic reaction with more serious symptoms. These could be skin rashes such as hives, fever or joint pain, trouble breathing, speaking or swallowing, wheezing or shortness of breath, swelling of parts of the face (lips, tongue, and throat), hands or feet. Get medical attention right away if you have trouble breathing; speaking or swallowing; wheezing; shortness of breath; or swelling of the mouth, tongue or throat.

Although rare, taking iodine may cause over-activity of the thyroid gland, under-activity of the thyroid gland, or enlargement of the thyroid gland (goiter).

Usually, side effects of potassium iodide happen when people take higher doses for a long time. You should be careful not to take more than the recommended dose or take it for longer than you are advised to.

WHAT TO DO IF SIDE EFFECTS OCCUR

If the side effects are severe or if you have an allergic reaction, stop taking potassium iodide. Call a doctor or public health authority for instructions and get medical attention right away.

WHO SHOULD NOT TAKE POTASSIUM IODIDE

People who should not take potassium iodide include individuals with a known allergy to iodine or with a pre-existing thyroid disease (e.g., Graves' disease, thyroid nodules, Hashimoto's thyroiditis) that might predispose them to adverse reactions. People who also have dermatitis herpetiformis or hypocomplementemic vasculitis should not take KI because these conditions may increase the chances of side effects to iodine

I have read the information on this form about potassium iodide. I have had a chance to ask questions which were answered to my satisfaction. I believe I understand the benefits and risks of potassium iodide and request that it be given to me or to the person named below for whom I am authorized to make this request.

INFORMATION ON PERSON TO RECEIVE POTASSIUM IODIDE

Name (please print) _____ Signature _____ Date _____

Address, City, State ZIP _____ County _____

DOB _____ Age _____ E-mail _____ Phone _____

ADPH Representative _____ **Signature** _____ **Date** _____

ADPH Representative Phone _____

RADIOLOGICAL FIELD MONITORING TEAM

Pre-Departure Checklist

Equipment *(One per team)*

1. **Radiological Monitoring Kit**
   - **Ludlum 14C (primary instrument)**
   - **HP probe**
   - **Pancake probe**
   - **Ludlum 9DP (pressurized ion chamber; issued during ingestion or actual event)**

2. **Communications**
   - **CriticalLinc radio & car charger**
   - **Cell phone & car charger**
   - **Car adapter**

3. **Supplies**
   - **EPZ Plant Map (10-mile and/or 50-mile)**
   - **Radiological Field Team Manual**
   - **Portable air sampler**
   - **RFMT large black pelican case and small grey box (inventory list inside each)**
   - **Brown cardboard sample box(s)**
   - **Protective Disposable Apparel (OREX Coveralls)**

Prior to Departure:

- **Assign a DAD to each RFMT member, and zero two (2) pocket dosimeters (200mR and 5R)**
- **Assemble meter with gamma probe (check for proper operation)**
- **Cover probe with plastic wrap or equivalent**
- **Turn on meter and speaker**
- **Check background with each probe and record and report background to SRMAC**
- **Prepare sample area in vehicle and sample box**
- **Prepare bag with a Radioactive Material label and place in back of vehicle for radioactive waste**
- **Conduct an operational check (run sampler for 5-10 seconds) for all air samplers prior to departure**
- **Establish radio contact with SRMAC and request update(s)**
- **Test backup phone by making connection with the SRMAC Field Team Coordinator**
- **Receive a radiological safety briefing**

Unless Otherwise Instructed:

- **Leave location if meter (dose rate) reads 200 mR/hr or greater**
- **Seek Relief, if possible, when DRD is 100 mR (200 mrem TEDE)**
- **Establish contact with SRMAC at least every 30 minutes**
- **Check DRDs at least every 30 minutes (15 minutes if > 1mR/hr)**