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IP-EP-320, REV. 14

**AUGUST 15, 2019**

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## Radiological Field Monitoring

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Effective Date: August 15, 2019

*This procedure excluded from further LI-100 reviews.*

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## Radiological Field Monitoring

### 1.0 PURPOSE

To describe the methods used to conduct radiological monitoring and related activities performed by the Field Monitoring Teams outside the Protected Area and their interaction within the Emergency Response Organization (ERO) during a radiological emergency at the Indian Point Energy Center (IPEC).

#### NOTE

To expedite the actions of the Offsite Monitoring Teams (OMTs) and Offsite Team Coordinator (OTC), users of this procedure are permitted to proceed directly to Section 5.0 and related attachments and implement steps in any sequence as required for operational efficiency. Other portions of this procedure may be used for reference as needed.

### 2.0 REFERENCES

- 2.1 Indian Point Energy Center Emergency Plan
- 2.2 EN-EP-609, Emergency Operations Facility
- 2.3 EN-IS-120, Motorized Vehicle Safety

### 3.0 DEFINITIONS

- 3.1 Radiological Monitoring - Locating and defining a plume of radioactive airborne contamination and any surface contamination left in the wake of a plume.
- 3.2 Monitoring Activities - Detecting beta radiation, measuring gamma radiation and sampling airborne and surface contamination at selected locations, recording data and reporting the data for additional analysis.
- 3.3 Monitoring Data - Data reported to the EOF that may be used by the ERO to determine emergency action levels, emergency classifications, radiological exposure controls, protection for on-site personnel and emergency workers, and protective action recommendations for the general public.
- 3.4 Emergency Sampling Points - Include some sixty points within the 10-Mile Emergency Planning Zone (EPZ) identified herein to facilitate dispatch of the Monitoring Teams.
- 3.5 Mobilization - Offsite Team Members are notified of a declared emergency at either Unit 2 or Unit 3, directed to report to the Emergency Operations Facility (EOF) and are expected at the EOF within the 60 minutes following the declaration. At the EOF, Offsite Team Members report to the Radiological Assessment Coordinator for assignment to the 1st or 2nd shift teams.

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- 3.6 Onsite Monitoring – Radiological Monitoring performed within the Protected Area Boundary.
- 3.7 Offsite Monitoring – Radiological Monitoring performed outside the Protected and Owner Controlled Area Boundary.

**4.0 RESPONSIBILITIES**

- 4.1 The Shift Manager (SM) or the Emergency Plant Manager (EPM), in absence of the Radiological Assessment Coordinator, may direct Offsite Monitoring Teams from the Central Control Room (CCR).
- 4.2 Offsite Monitoring Teams are dispatched, directed, and controlled by an Offsite Team Coordinator or Communicator from the CCR, the EOF or the AEOF.
- 4.3 In Sectors 12 through 1 the perimeter is monitored by the Onsite Monitoring Radiation Protection Technicians from the OSC directed by the Radiation Protection Coordinator at the request of the Radiological Assessment Coordinator. Once the Onsite Monitoring Team has been dispatched, further direction will be administered by the Radiological Assessment Coordinator.

<u>Perimeter Sector</u>	<u>Position</u>	<u>Team</u>
2 – 11	Radiological Assessment Coordinator	Offsite Monitoring Team
12,13,14,15,16,1	Radiation Protection Coordinator	Radiation Protection Technicians

- 4.4 The Dose Assessor (DA) in the EOF assures radiological controls are implemented for samples, equipment, materials, supplies and personnel in the EOF.
- 4.5 Qualified Nuclear Environmental Monitoring (NEM) Technicians change DLRs and air sampling station filters at fixed sites within the 10 Mile EPZ, submit the DLRs and filters for analysis, sample soil and water and perform other activities prescribed in the station NEM Procedures.
- 4.6 The steps of this procedure need not be followed in sequence and may be referred to in conjunction with instructions contained in the attachments.
- 4.7 Use Form EP-3-ALL, Emergency Response Organization Log Sheet, to record Field Monitoring Team actions and activities.
- 4.8 The Offsite Team Coordinator is responsible for Attachment 16, Offsite Team Coordinator Checklist.












## 5.0 DETAILS


The following graphic depicts the Offsite Monitoring Team (OMT) process and also references the related attachments to be followed. **(Further background discussion is provided in Attachment 15 at the end of this procedure).**

**FIGURE 1**  
**IPEC Offsite Monitoring Team Process Steps**

**NOTE: YOU WILL NEED THE FOLLOWING FORMS (IN POSITION BINDERS):**

- ☐ ERO Log (Form EP-3-ALL)
- ☐ Individual Exposure Tracking Log, (Form EP-36)
- ☐ Field Team Inventory (Forms EP-AD6-1)
- ☐ Monitoring Team Sample Data (Forms EP-30 and EP-31)
- ☐ Potassium Iodide (KI) Instructions/Briefing Form (EP-8-ALL)

	Activity	Referenced Job Aid
1.	Offsite monitoring team reporting and initial actions 	<i>See Attachment 9.1</i>
2	Perform pre-operational inspection and testing of equipment 	<i>See Attachment 9.2</i>
3	Perform initial vehicle contamination check (if requested) 	<i>See Attachment 9.3</i>
4	Conduct field team pre-deployment briefing 	<i>See Attachment 9.4</i>
5	Perform field plume radiation measurements 	<i>See Attachment 9.5</i>
6	Perform field air sampling measurements 	<i>See Attachment 9.6</i>
7	Perform environmental surface contamination smears 	<i>See Attachment 9.7</i>
8	Perform continuous exposure reporting and control actions 	<i>See Attachment 9.8</i>
9	Perform post-field monitoring actions 	<i>See Attachment 9.9</i>

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## **6.0    INTERFACES**

- 6.1    IP-EP-210, Central Control Room
- 6.2    EN-EP-609, Emergency Operations Facility
- 6.3    IP-EP-115, Emergency Planning Forms
- 6.4    IP-EP-330, Airborne Sample Analysis

## **7.0    RECORDS**

All Logs, Completed Forms and other records generated during an actual emergency shall be considered Quality Records and maintained for the life of the plant. The following records are generated by implementation of this procedure:

- 7.1    ERO Logs, (Form EP-3-ALL)
- 7.2    Individual Exposure Tracking Log (Form EP-36)
- 7.3    Monitoring Team Survey Data (Form EP-30)
- 7.4    Monitoring Team Sample Data (Form EP-31)
- 7.5    Field Team Inventory (Form EP-AD6-1)
- 7.6    Potassium Iodide (KI) Instructions/Briefing Form (EP-8-ALL)

## **8.0    REQUIREMENTS AND COMMITMENT CROSS-REFERENCE**

None

## **9.0    ATTACHMENTS**

- 9.1 Offsite monitoring team reporting and initial actions
- 9.2 Perform pre-operational inspection and testing of equipment
- 9.3 Perform initial vehicle contamination check (if requested)
- 9.4 Conduct field team pre-deployment briefing
- 9.5 Perform field plume radiation measurements
- 9.6 Perform field air sampling measurements
- 9.7 Perform environmental surface contamination smears
- 9.8 Perform continuous exposure reporting and control actions
- 9.9 Perform Post-field monitoring actions
- 9.10 IPEC Site Map
- 9.11 Offsite Monitoring Locations
- 9.12 Reuter Stokes Locations
- 9.13 GPS Monitoring Locations
- 9.14 Sampling Points – Distance and Location
- 9.15 Radiological Field Monitoring Discussion
- 9.16 Offsite Team Coordinator Checklist




### Attachment 9.1

## Offsite Monitoring Team Reporting and Initial Actions

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- ☐ Sign in at EOF Access Desk and on the board inside the EOF (or Alternative TSC/OSC).
- ☐ Report to the Offsite Team Coordinator (OTC) or the Radiological Assessment Coordinator (RAC) for team assignment.
- ☐ **IF** assigned to a team for the current shift, **THEN** ensure the names of the Team members are entered on the EOF Personnel Status Board **AND** continue with this procedure.
- ☐ **IF NOT** assigned to a team for the current shift, **THEN** continue with this procedure. Assist other teams until dismissed or assigned by the EOF Manager or the Radiological Assessment Coordinator.
- ☐ Each team, as a minimum, should consist of 2 members.
- ☐ Obtain Offsite Monitoring Team Position Binder.
- ☐ Obtain Keys for a vehicle (offsite Monitoring Kits storage location).
- ☐ Obtain Vehicle and also a radio, cell phone and GPS.
- ☐ Start vehicle, check gas gauge and verify proper operation of: horn, flashers, turn-signals and headlights Check that back hatch automatically opens and closes with key fob or hatch button and that it shuts securely when closed. Do not manually close hatch due to jamming concern. Inform Offsite Team Coordinator of any malfunctions or concerns.
- ☐ The following equipment and materials are available from the storage location:
  - Monitoring Kit (two sealed cases, A and B, per set) Case A is for plume survey/sampling; initially, load only Case A in OMT vehicles. Case B is for REMP (post-plume) sampling only.
  - Obtain count rate meters and other equipment/supplies from storage and load in OMT vehicles after checks are performed.
- ☐ Record the "**ERO Position:**" [and the Team Name e.g.; "Mobile One"] "**Date:**" and the team member [s] "**Name:**"[s] on Form EP-3-All.
- ☐ Use ERO Log Sheet(s) (Form EP-3-ALL) located in the Position Binder to record your activities.
- ☐ Use applicable Human Performance Tools (e.g., 3-part communications, place-keeping. peer checking and situational awareness appropriate for conditions.



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**Attachment 9.1**  
**Offsite Monitoring Team Reporting and Initial Actions**

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**NOTE:**

An Offsite Monitoring Team will not necessarily use all the equipment and materials in the Monitoring Kits. Some equipment is exclusively for the use of NEM Technicians.

- ☐ Check the seal on each case in the kit. **IF** the seal is not broken, **THEN** the inventory is not required.
- ☐ **IF** the seal is broken, **THEN** inventory the equipment in that case. Record the "Kit #" and results on Form EP-AD6-1 for the kits. Complete "Comments ", "Inventory Performed BY "and the "Date "on Form EP-AD6-1.
- ☐ Replace or exchange missing, out of calibration, and inoperative equipment, materials and supplies with what is available at the EOF. Do not use any out of calibration equipment or expired material or supplies.
- ☐ Turn on DOSE-GARD (press "M" button until 0.00 is displayed).
- ☐ Assign DLR's to each Offsite Team member. Wear the DLR badge and DOSE-GARD electronic dosimeter on the chest between the waist and neck. Fill in the pertinent information for each Offsite Team member on the top half of Form EP-36.

**NOTE:**

Without a Radiological Assessment Coordinator in the EOF, Offsite Monitoring Teams may be directed through the Communicator in the CCR.

- ☐ **IF** there has been a release of radioactive material to the atmosphere, **THEN** as directed by the Radiological Assessment Coordinator or the ED, check the vehicle for contamination **BEFORE** leaving the Site using **Attachment 9.3**.
- ☐ Perform Pre-Operational Inspection and Testing of Equipment in Attachment 9.2. Radiation check sources for OMTs #1 and #2 are stored on the shelf in the OMT Equipment Room at the EOF, and Spare OMT check sources are stored in the Apparatus Room storage cabinet at the Verplanck Fire Department.
- ☐ Place the case(s) in the vehicle with the Ludlum Model 177 count rate meter and the Model 9-3 ion chamber in the front seat (or back seat).



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### Attachment 9.2

## Perform Pre-Operational Inspection and Testing of Equipment

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### Ludlum Model 9-3 Ion Chamber

#### Use: 5 micro curie Cs-137 source for operational check

- ☐ Perform visual check of instrument for any physical damage, and slide open the shield on the bottom to ensure the Mylar window is not punctured.
- ☐ Close shield.
- ☐ Turn on meter by switching to "X1" scale.
- ☐ Perform battery check by pressing the "BAT TEST" button.
- ☐ While on the "X1" scale, if necessary zero the meter reading using the "ZERO ADJUST" thumbwheel.
- ☐ Center **BLUE** Cs-137 source on the laminated diagram. Turn to the "X10" scale, OPEN the shield and position the "Detector Area" of the instrument over the **BLUE** Cs-137 source on the diagram. (Number on source facing UP towards meter).
- ☐ Allow the reading to stabilize (~15 sec.) and then read the meter.
- ☐ Verify that the meter responds within the range listed on the source container (typically between 20 and 40 mR/hr). Closed shield after check complete.
- ☐ Source reading obtained: \_\_\_\_\_ mR/hr
- ☐ Toggle the "AUD" switch ON to verify audible response.
- ☐ If any of the above checks are unsatisfactory return the meter to the storeroom and acquire another meter. Note the serial number of an instrument that is UNSAT in comments below.
- ☐ If checks are SAT, then instrument is operational. (Note serial no. in box below).
- ☐ Return the radiation check source to the storage location – **DO NOT PLACE IN KIT.**

Instrument Serial Number (If SAT): \_\_\_\_\_


Cal Due Date: \_\_\_\_\_

Team Member \_\_\_\_\_

Date: \_\_\_\_\_

Comments if Instrument Check is UNSAT: \_\_\_\_\_

\_\_\_\_\_

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## Attachment 9.2

### Perform Pre-Operational Inspection and Testing of Equipment

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#### Ludlum Model 177 Count Rate Meter with HP 210 Probe

**Use: 1 micro curie Ba133 source for operability check.**

- ☐ Perform visual check of instrument, cable and probe for any physical damage.
- ☐ Connect the HP-210 probe by attaching the coaxial cable to the front of the meter (if not already connected).
- ☐ Turn the power switch to "ON" (if not already turned "ON").
- ☐ Perform battery check by pressing the **RED** "BAT TEST" button. If battery response is not adequate, then obtain spare meter.
- ☐ Turn the function switch to "X100", place probe in contact with **ORANGE** Ba133 source, until the meter reads upscale. (Number on source facing UP towards probe).
- ☐ Verify that the meter responds within the range listed on the source container (typically between 2,000 and 10,000 cpm).
- ☐ Source reading obtained \_\_\_\_\_ cpm
- ☐ Turn up the Volume Dial. Ensure the volume is audible when near the check source.
- ☐ If any of the above checks are unsatisfactory return the meter to the storeroom and acquire another meter. Note the serial number of an instrument that is UNSAT in comments below.
- ☐ If checks are SAT, then instrument is operational. (Note serial no. in box below).
- ☐ Return the radiation check source to the storage location – **DO NOT PLACE IN KIT.**

Instrument Serial Number (If SAT): \_\_\_\_\_

Cal Due Date: \_\_\_\_\_

Team Member \_\_\_\_\_

Date: \_\_\_\_\_

Comments if Instrument Check is UNSAT: \_\_\_\_\_

\_\_\_\_\_



## Attachment 9.2

### Perform Pre-Operational Inspection and Testing of Equipment

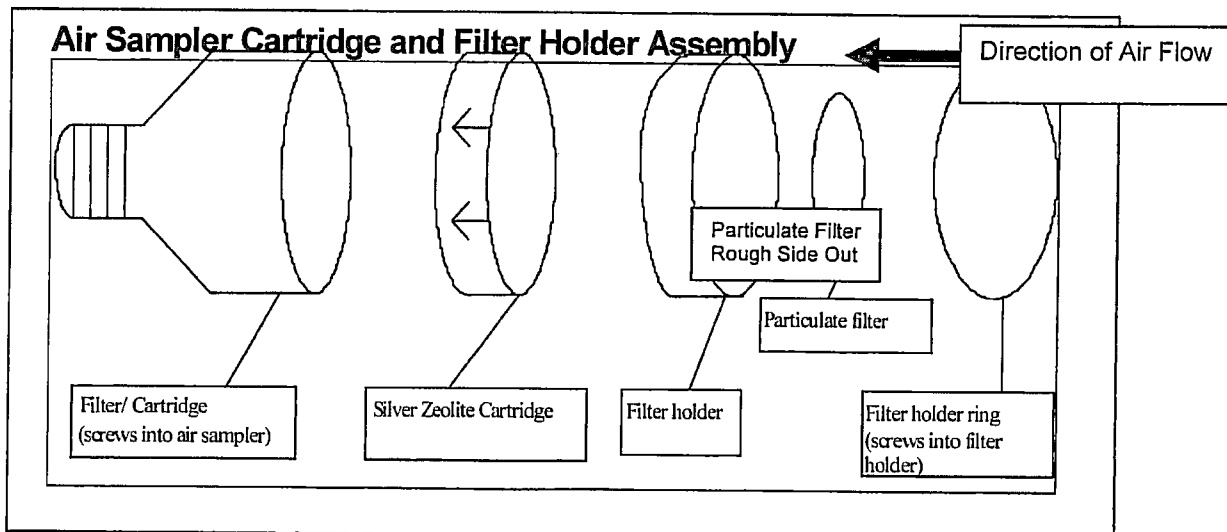
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#### F&J Model DF-AB-40L Air Sampler (Using Sampler Battery)

- ☐ Attach the filter holder containing particulate and iodine collection media (See drawing below).
- ☐ Open the cover of the air sampler and check the status of the battery by pressing the button on the battery charge indicator.
- ☐ Verify that its charge is at least 75%; if not, select another sampler. If necessary, the air sampler's power cord may be plugged into the inverter or the provided charger cord may be plugged into the 12 V cigarette lighter receptacle in the OMT vehicle if there is not sufficient battery charge.
- ☐ Place the **BLACK** "ON/OFF" toggle switch in the "ON" position.
- ☐ If circuitry is not energized by the previous step then push the **YELLOW** "ON/OFF" button to energize the circuitry.
- ☐ The LED display should read 0.00 cfm and the "flow" LED should be lit.
- ☐ Press "Total Volume" Button - IF volume displayed is above zero , THEN press reset.
- ☐ Press the "RESET" button to start the sample pump. After a few seconds, the LED display should gradually increase to approximately 1.0 cfm (0.8 cfm to 1.2 cfm).
- ☐ After approximately 30 seconds, push the **YELLOW** "ON/OFF" button to stop the sample pump. Place the toggle switch to the "OFF" position.
- ☐ Carefully close and latch the cover (avoid crimping the red wire).
- ☐ If results are UNSAT, then obtain another sampler. Note the serial number of a sampler that is UNSAT under comments.
- ☐ If checks are SAT, then instrument is operational. Note serial no. \_\_\_\_\_
- ☐ Comments if air sampler check UNSAT: \_\_\_\_\_

Instrument Serial Number: \_\_\_\_\_

Cal Due Date: \_\_\_\_\_





## **Attachment 9.2**

### **Perform Pre-Operational Inspection and Testing of Equipment**

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- ☐ Check operation of the mobile radio, cellular phone and other communication equipment in the vehicle with the Communicator who is dispatching and controlling the team. Record results on Form EP-3-ALL.

#### **IPEC Offsite (Goosetown) Radio**

- ☐ Ensure the Offsite Team Coordinator is aware that you will be conducting a radio check.
- ☐ Turn vehicle ignition switch to "Run" or "Accessories".
- ☐ Push radio "On/Off" switch to "On".
- ☐ Select Channel 1 (or other offsite channels provided).
- ☐ Press the microphone "PTT" switch.

#### **NOTE**

**Radio call signs are transmitted automatically; transmitting by voice is no longer required. Use the station name; e.g., "Mobile One" for identification.**

- ☐ Request radio check; e.g., "Indian Point EOF, this is Indian Point Mobile One, request radio check, over".
- ☐ Record results on Form EP-3-ALL, ERO Log.

Team Member: \_\_\_\_\_

Date: \_\_\_\_\_

#### **NOTE:**

**IF** radio communication with the EOF or AEOF is not established, **THEN** try 1) the cellular phone, 2) another location where radio or telephone communication is acceptable, 3) relaying messages through other stations in either "5...Offsite", "4...Onsite" or "9-13...Talk-around" modes or 4) a pay phone. **IF** all fail, **THEN** return to EOF or Alternative TSC/OSC.



### Attachment 9.2

## Perform Pre-Operational Inspection and Testing of Equipment

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### CELLULAR TELEPHONE

1. Turn phone power on.
2. Display "SERVICE AVAILABLE".
3. Use the number in Emergency Telephone Directory for the Offsite Team Coordinator
4. Call the Offsite Team Coordinator.
5. If no contact, determine alternate means of communications in the event that the radio is inoperable.
6. Record results on (Form EP-3-ALL) ERO Log.

### GARMIN GPS UNITS

Locations are Pre-programmed

1. Turn on "Where to" icon on main screen.
2. Select "Extras" icon.
3. Select "POI Point of Interest" (e.g. Select any survey point from next step for quick check of GPS).
4. Monitoring location can be identified by Sector and Mile, e.g. S1-M1, S2-M2. If not displayed, type desired location. See Attachment 13.
5. Press "Go".
6. Check that start to destination is loaded and displayed.

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### **Attachment 9.3**

#### **Perform initial Vehicle Contamination Check (if requested)**


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- ☐ **IF** there has been a release of radioactive material to the atmosphere, **THEN** as directed by the Radiological Assessment Coordinator or the ED, check the vehicle for contamination **BEFORE** leaving the Site.
- ☐ When directed by the EOF to perform surface contamination checks, use Form EP-31, Surface Contamination Check, to record information using either of the 2 following methods:

#### **(Preferred) Method Using the Ludlum 177 Count Rate Meter, with HP-210 Pancake Probe**

- ☐ Use the following equipment:
  - ☐ Ludlum 177 Count Rate/HP-210 Pancake Probe
- ☐ Ensure the meter has been pre-operationally checked, turned on and set to X1 scale.
- ☐ Measure and record background reading away from the vehicle. (The background reading should be 300 cpm or less).
- ☐ Holding the pancake probe about ½ to 1 inch from the vehicle surfaces, check readings on the vehicle hood, side doors and accessible areas of the roof.
- ☐ Enter the "**Date**", the name of the Field Team Member and "**LOCATION**" on Form EP-31.
- ☐ Immediately inform the Offsite Team Coordinator and/or Radiological Assessment Coordinator of any vehicle surface readings exceeding 100 cpm above background.

**OR,**

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### Attachment 9.3

## **Perform initial Vehicle Contamination Check (if requested)**

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### **Method Using Smears and the Ludlum 177 Count Rate Meter, with HP-210 Pancake Probe**


- ☐ When directed by the EOF to perform surface contamination checks, use Form EP-31, Surface Contamination Check, to record information.
  - ☐ Use the following equipment:
    - ☐ Surgeon's rubber gloves
    - ☐ Smear or gauze wipes
    - ☐ Small paper envelope or plastic bag
    - ☐ Pen or pencil **AND** magic marker or grease pencil
    - ☐ Ludlum 177 Count Rate/HP-210 Pancake Probe
- ☐ Ensure the meter has been pre-operationally checked, turned on and set to X1 scale.
- ☐ Enter the "**Date**", the name of the Field Team Member and "**LOCATION**" on Form EP-31.

#### **NOTE:**

Find at least 2 exposed exterior vehicle surfaces to sample for contamination, such as the vehicle hood and an accessible area of the vehicle roof.

- ☐ Find **AND** smear at least 2 surfaces Smear a 100-cm<sup>2</sup> area. Put two fingers on a smear or wipe **AND** hold it with your thumb. Reach out **AND** drag it back across the surface in the pattern of an "S".
- ☐ Record the "**Time**" and the "**SURFACE SMEARED**" on Form EP-31.
- ☐ Annotate a small paper envelope for a smear or a small plastic bag for a gauze wipe with this information from Form EP-31:
  - ☐ "Date"
  - ☐ "LOCATION"
  - ☐ "Time"
  - ☐ "SURFACE SMEARED"
- ☐ Place the smear or wipe in the paper envelope or plastic bag.
- ☐ Proceed to the ALARA location to count the samples.
- ☐ Count the vehicle smears using pages 2 and 3 of Attachment 9.7.



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## **Attachment 9.4**

### **Conduct Field Team Pre-Deployment Briefing**

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#### **Begin Offsite Field Monitoring Team briefing on emergency conditions**

- ☐ Ensure that the Offsite Team Coordinator or designee has provided a Team designation (e.g., "Mobile One"), and has the Team member names and contact information along with their DLR numbers.
- ☐ Review **AND** note conditions, monitoring locations, routes, and requirements with Offsite Team Coordinator or designee.
- ☐ Plant conditions and emergency classification level.
- ☐ Release conditions
  - Release start and stop
  - Noble gas / Iodine ratio (if known)
  - Expected dose rates, surface and airborne contamination
  - Current Reuters Stokes readings, if any
  - Potential for Offsite Monitoring Team vehicles to be contaminated (and the need if any to conduct pre-deployment check)
- ☐ Measured and forecast meteorological conditions
  - Wind direction, speed, Pasquill stability class
- ☐ Projected Plume location
  - Width (affected sectors)
  - Plume characteristic (cross, down or up valley)
- ☐ Areas, routes and locations, including Emergency Sampling Points to monitor
- ☐ Any known traffic impediments or traffic-related issues.
- ☐ Use of personnel (i.e. protective clothing) and vehicle safety equipment.
- ☐ Monitoring requirements:
  - Projected radiation fields in route (verify with count rate meter/ ion chamber CW readings when inside the vehicle)
  - Projected radiation fields on location (verify with 3 ft. / 3 in OW/CW readings when outside the vehicle)
  - Airborne contamination (if known)
  - Surface contamination (if known)

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### Attachment 9.4

## **Conduct Field Team Pre-Deployment Briefing**

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### Review radiological exposure controls

- ☐ Minimize time (Goal: <15 min.) spent within elevated radiation fields especially those near or within the plume.
- ☐ Record and report dosimeter readings every \_\_\_\_ minutes.
- ☐ ALARA locations.
- ☐ **DO NOT** enter a radiation field within a plume that is greater than 100 mR/hr except as directed by the Radiological Assessment Coordinator.
- ☐ Females who have declared pregnancy are advised that they are not authorized to exceed 10CFR20 limits and may need to be re-assigned.

#### NOTE:

The Emergency Director (ED) may authorize an initial emergency exposure of 1 Rem TEDE and subsequent exposures in 1 Rem increments to 5 Rem TEDE.

- ☐ **DO NOT** exceed the authorized dose of \_\_\_\_ Rem (i.e., dosimeter reading) except when directed by the Radiological Assessment Coordinator.
- ☐ The DOSE-GARD electronic dosimeter is pre-set to alarm at 1.00 R. If the DOSE-GARD alarms, immediately notify the EOF/AEOF and request instructions. (The alarm can be silenced by toggling "M" two times to get Alarm Acknowledge Mode. Hold "S" for 3 seconds and the alarm will be silenced and the mode returns to dose display).


#### NOTE:

The Emergency Director, using Form EP-4-ALL, Emergency Exposure Authorization, will authorize exposure exceeding 5 Rem TEDE.

- ☐ **DO NOT** exceed 5 Rem TEDE except when authorized by the ED.

#### NOTE:

Potassium Iodide (KI) shall be used in accordance with IPEC's procedure for issuance of KI and the NYS KI Policy. Administration of KI will be recommended for emergency responders at a General Emergency or a projected child thyroid dose of 5 Rem CDE or more to the thyroid.


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### **Attachment 9.4**

## **Conduct Field Team Pre-Deployment Briefing**

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- ☐ **DO NOT** take KI except when authorized by the Emergency Director. Individuals who are allergic to iodine should not take KI.
- ☐ If KI is taken, note on Form EP-36 and Form EP-8-ALL.
- ☐ Proceed as directed by the Communicator / Offsite Team Coordinator:

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## **Attachment 9.5** **Perform Field Plume Radiation Measurements**

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### **Perform Downwind Radiation Surveys**

- ☐ Maintain radio or telephone communications with the Communicator/Offsite Team coordinator in route between locations. Each Offsite Monitoring Team should contact the Offsite Team Coordinator at approximately thirty (30) minute intervals.
- ☐ **Monitor radiation fields at landmarks in route to and on arrival at the location.**
  - ☐ Begin with the Ludlum Model 177 Count Rate Meter with Pancake Probe:

#### **NOTE:**


**Rate Meter readings will increase as a plume of radioactive material is approached. Place the speaker switch to "ON".**

- ☐ Put the function switch to "X1".
- ☐ Note the beginning background reading in CPM on Form EP-30.
- ☐ Keep the rate meter and probe on the floor of the cab (probe facing up) with meter volume turned up.
- ☐ Read AND record on Form EP-30 approximately major changes (e.g., factor of ten) of the reading (CPM) and the nearest landmark including the reading on arrival at the location.
- ☐ Report major changes in readings and landmark to the Communicator.
- ☐ WHEN the Rate Meter reads about 1000 CPM or more at "X10" AND the Ion Chamber reads 0.2 mR/hr or more on the lowest mR/hr scale, THEN use the Model 9-3 Ion Chamber.

#### **CAUTION:**

Review radiological exposure controls (**Attachment 9.8**), prepare equipment and data forms, determine the route to the nearest ALARA location **AND** prepare to implement personal protective measures as directed by the Radiological Assessment Coordinator before approaching and entering a plume.

- ☐ Continue with the Ion Chamber.

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### **Attachment 9.5**

## **Perform Field Plume Radiation Measurements**


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### **NOTES:**

If traversing the plume, the closed window (CW) readings increase to reach a peak across the plume at the centerline.

**Plume boundary is defined as when the open window reading is 1.5 times the closed window reading.**

- ☐ With the shield closed, read AND record on Form EP-30 each major change of the "**CW mR/hr**" (i.e., gamma) and the nearest landmark.
- ☐ Read AND record "**CW mR/hr**" (i.e., gamma) on Form 30.
- ☐ Continue to adjust the function switch to the appropriate scale for an on-scale reading.
- ☐ WHEN the Ion Chamber reads less than 0.2 mR/hr, THEN use the Ludlum 177 Count Rate Meter with Pancake Probe.
- ☐ Report the data on Form EP-30 to the Offsite Team Coordinator.
- ☐ Arrive on location. Record Team arrival on Form EP-3-ALL Report Team arrival to the Offsite Team Coordinator.

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### **Attachment 9.5**

## **Perform Field Plume Radiation Measurements**

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- ☐ While proceeding to assigned location:
  - ☐ Note where readings reach peak levels (plume centerline).
  - ☐ When requested, conduct air sampling on the plume centerline using **Attachment 9.6**.
  - ☐ When requested, conduct surface contamination checks using **Attachment 9.7**.
- ☐ Monitor radiation fields on location.
  - ☐ Use the Count Rate Meter with Pancake Probe. If it reads more than 1000 cpm on the "**X10**" scale AND the Ion Chamber reads 0.2 mR/hr or more on the "**X1**"-scale, **THEN** use the Ion Chamber.
  - ☐ Record the "**Team Name:**" "**Team Member Names:**" and "**Date:**" on Form EP-31.
  - ☐ Record the "**Location:**" including the details, on Form EP-31.
  - ☐ Record the meter "**Serial #:**" and the "**Time:**" on Form EP-31.
  - ☐ Leave the vehicle and proceed to an area that is open overhead.
  - ☐ Measure OW and CW radiation fields at 3 feet and 3 inches above the ground. Record the data on Form EP-31.
  - ☐ When requested, conduct surface contamination checks using **Attachment 9.7**.
  - ☐ Keep pertinent current information on Form EP-3-ALL, ERO Log Sheet.
    - Dosimeter readings
    - Plant, radiological and meteorological conditions
    - Monitoring requirements
    - Radiological, exposure controls
    - ALARA locations
    - Landmarks on the route



### Attachment 9.5

## Perform Field Plume Radiation Measurements

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### NOTE:

#### For Plume Characterization:

Outside the Plume: the Open Window (OW) readings are approximately equal to the Closed Window (CW) readings (e.g., OW readings are less than 1.5 times CW readings).

Inside the Plume: the Open Window (OW) readings are expected to be about 1.5 times or greater than the Closed Window (CW) readings.

- ☐ Ion Chamber @ 3 feet:
  - ☐ Read AND record "(OW) (mR/hr)" Form EP-31.
  - ☐ Read AND record "(CW) (mR/hr)" Form EP-31.
  
- ☐ Ion Chamber @ 3 inches:
  - ☐ Read AND record "(OW) (mR/hr)" Form EP-31.
  - ☐ Read AND record "(CW) (mR/hr)" Form EP-31.
  
- ☐ Return the Ion Chamber to the vehicle.
- ☐ Report the data on Form EP-31 to the Offsite Team Coordinator.

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### Attachment 9.5

## **Perform Field Plume Radiation Measurements**

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### **NOTE:**

If ground deposition is present:

1. At three inches: the open window reading will be greater than the closed window reading.
2. The three foot open and closed window readings will be less than the three inch readings in (1) above.
3. A sample of surface materials (swipe) taken in the area and counted in a lower background area will indicate contamination.

- ☐ When requested, conduct air sampling on the plume centerline. Using **Attachment 9.6**.
- ☐ When requested, conduct surface contamination checks using **Attachment 9.7**.





## Attachment 9.6

### Perform Field Air Sampling Measurements

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#### Perform air sampling on the plume centerline:

- ☐ Set up for Air Sampling:
- ☐ Place particulate filter in the first inlet filter holder (farthest from the pump with the rough side of the filter out).
- ☐ Place silver zeolite cartridge in the second inlet filter holder (closest to the pump), as appropriate:

#### NOTE:

Humidity may affect the silver zeolite cartridge. Use sealed cartridge during an activation.

- ☐ Use silver zeolite cartridges during an activation (and "drill" silver zeolite cartridges during training or drills).
- ☐ Align the arrow on the cartridge in the direction of airflow through the holder.
- ☐ Record the following on Form EP-31)
  - ☐ Sample ID number
  - ☐ Sampler Serial #
  - ☐ Date/Time
- ☐ Start Air Sampler: as follows:
  - ☐ Place the BLACK "ON/OFF toggle switch in the "ON" position.
  - ☐ If circuitry is not energized, by the previous step then push the YELLOW "ON/OFF" button to energize the circuitry.
  - ☐ The LED display should read 0.00 cfm and the "flow" LED should be lit.
  - ☐ Press the "RESET" button to start the sample pump. After a few seconds, the LED display should gradually increase to approximately 1.0 cfm (0.8 cfm to 1.2 cfm).
- ☐ Record the sample start time on Form EP-31.
- ☐ While the air sampler is running, take at least one 3-ft OW and CW reading to verify that you are still in the plume. Notify the OTC if conditions have significantly changed.

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## Attachment 9.6


### **Perform Field Air Sampling Measurements**

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- ☐ Wait until the sample pump stops automatically (in approximately 10 minutes). The sample volume is preset to 10 cubic feet. This can be verified by pressing the "volume" button after the sampler has stopped. Reset the sample "volume" indicator to zero to allow restart for purging.
- ☐ The air sampler and Model 9-3 meter may be contaminated. Place these in large clean plastic bags before placing in back of vehicle.
- ☐ If needed, contact the Offsite Team Coordinator to determine nearest appropriate "clean" location outside the plume to go for sample counting (less than ~100 cpm background).
- ☐ At a location outside of the plume, with the loaded sample holder in place, PURGE the sample cartridge and filter by pressing the YELLOW On/Off button to "Off" and then "On". Then press the RESET button. Let the sampler run for about 20 seconds.
- ☐ Press the RESET button again to stop the sample pump. Reset the sample "volume" indicator to zero to allow restart for collecting the next air sample.
- ☐ Assemble needed items in back of vehicle – sampler holder, tweezers, sample envelopes, sample bags, trash bag, clean plastic sheeting work surface.
- ☐ **One team member should handle samples and equipment wearing disposable gloves; the other team member should record and report data (gloves optional if not handling contaminated objects).**
- ☐ The team member with gloves should open the air sampler bag and remove the filters from their respective holders.
- ☐ Check hands with frisker and change gloves as noted below when handling and counting samples taken in the radioactive plume.

#### **Count the Air Samples:**

- ☐ Ensure that the Ludlum 177 meter is on and set to the x1 scale with the HP-210 connected.
- ☐ Place the HP-210 probe on the sample holder and check the background reading.
- ☐ Record the BACKGROUND CPM on Form EP-31. If contamination on the holder is suspected, wipe the sample holder with a disposable wipe and recheck with frisker.
- ☐ Leave the HP-210 probe on its side to allow easy hand frisking. Change gloves as needed.


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### **Attachment 9.6**

## **Perform Field Air Sampling Measurements**

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- ☐ Obtain a clean metal planchet from the OMT case. Remove the sample holder from the air sampler, unscrew the filter holder and carefully remove the particulate filter with the tweezers provided.
- ☐ Place the particulate filter (FUZZY SIDE UP) in a clean planchet, place the planchet in the sample holder on top of the holder insert ring and check the particulate filter with the HP-210 probe and obtain the GROSS CPM reading.
- ☐ The "clean" team member should record the particulate filter GROSS CPM reading on Form EP-31.
- ☐ Subtract the BACKGROUND CPM from GROSS CPM to obtain NET CPM, and record on Form EP-31.
- ☐ The gloved team member should use tweezers to place filter in marked envelope and place in baggie. Discard planchet by placing in a waste bag provided in the case.
- ☐ To count the iodine filter cartridges in the sample holders, modify the holders as follows:
  - ☐ Using the SH-4a, pull out the slide.
    - ☐ Remove the insert.
    - ☐ Push the slide back in.
- ☐ Place the HP-210 probe on the sample holder and check the background reading.
- ☐ Record the BACKGROUND CPM on Form EP-31. If contamination on the holder is suspected, wipe the sample holder with a disposable wipe and recheck with frisker.
- ☐ Change disposable gloves, place the silver zeolite cartridge (INLET SIDE UP – ARROWS FACING DOWN) in the cavity created by removing the sample holder slide.
- ☐ Place the HP-210 probe on the sample holder and measure the cartridge reading.
- ☐ The "clean" team member should record the iodine cartridge GROSS CPM on Form EP-31.


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### **Attachment 9.6**

## **Perform Field Air Sampling Measurements**

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- ☐ Subtract the BACKGROUND CPM from GROSS CPM to obtain NET CPM, and record on Form EP-31.
- ☐ Check hands with frisker and change gloves as needed.
- ☐ The gloved team member should use tweezers or clean gloves to place cartridge in separate baggie and place baggie inside other baggie containing filled out particulate filter envelope.
- ☐ Report the data on Form EP-31 to the Offsite Team Coordinator.
- ☐ Load a new iodine cartridge and particulate filter in the air sample holder before moving to a new survey/sampling location.
- ☐ Return the sampler and holder, the count rate meter and probe, the counting fixture and tweezers to the vehicle.
- ☐ Return packaged samples to the vehicle. Place samples in easily accessible location in the vehicle for easy transfer to RP when returning to the EOF or the Verplanck Fire Department.
- ☐ IF at an ALARA location, THEN remain there until directed otherwise. Continue monitoring for radiation fields from the vehicle. Periodically report conditions to the Offsite Team Coordinator. Prepare for reassignment.

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### **Attachment 9.7**

## **Perform Environmental Surface Contamination Smears**

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- ☐ When directed by the EOF to perform surface contamination checks, use Form EP-31, Surface Contamination Check, to record information.
  - ☐ Use the following equipment:
    - ☐ Surgeon's rubber gloves
    - ☐ Smear or gauze wipes
    - ☐ Small paper envelope or plastic bag
    - ☐ Pen or pencil AND magic marker or grease pencil
  - ☐ Enter the "**Date**", the name of the Field Team Member and "**LOCATION**" on Form EP-31.

### **NOTE:**

Find a surface to sample for contamination. Avoid unfinished wooden and hard surfaces with sharp edges. Use smears for smoother surfaces and gauze wipes for rougher surfaces.

- ☐ Annotate a small paper envelope for a smear or a small plastic bag for a gauze wipe with this information from Form EP-31:
  - ☐ "LOCATION"
  - ☐ "DATE" and "TIME"
  - ☐ "SURFACE SMEARED"
- ☐ Find AND smear a surface. Smear a 100-cm<sup>2</sup> area. Put two fingers on a smear or wipe AND hold it with your thumb. Reach out AND drag it back across the surface in the pattern of an "S".
- ☐ Record the "**Time**" and the "**SURFACE SMEARED**" on Form EP-31.
- ☐ Place the smear or wipe in the paper envelope or plastic bag.
- ☐ Proceed to the ALARA location to count the samples.



### Attachment 9.7

## Perform Environmental Surface Contamination Smears

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### NOTE:

Unless otherwise directed, count the samples where background is less than 300 CPM. IF samples must be counted in background higher than 300 CPM, THEN the gross count rate for the sample must be greater than twice background. If necessary, relocate to a different location.

### Measure the surface contamination samples.

- ☐ Use the following:
  - ☐ Ludlum 177 Count Rate Meter, with HP-210 pancake probe
  - ☐ Surgeon's rubber gloves
  - ☐ Tweezers
  - ☐ Planchets
  - ☐ Smear or wipe in a small paper envelope or plastic bag
  - ☐ Form EP-31 used to record surface contamination sampling data.

### Determine the activity (CPM) on the smear or wipe.

- ☐ Using either the Ludlum 177 with pancake probe to measure background for the smear or wipe, "**BKGD CPM**".
  - ☐ Place the probe about one quarter inch above an empty planchet using the SHA4 holder.
  - ☐ Adjust the function switch to the lowest multiplier without exceeding full scale on the meter.
  - ☐ Read AND record the "**BKGD CPM**" on Form EP-31.
- ☐ Measure the smear or wipe, "**SMEAR + BKGD CPM**".
  - ☐ Remove, using tweezers, a smear or wipe from the envelope or plastic bag. Place the smear or wipe on the planchet.



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### Attachment 9.7

## Perform Environmental Surface Contamination Smears

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- ☐ Place the probe about one quarter to one half inch above the smear or wipe.
- ☐ Adjust the function switch to the lowest multiplier without exceeding full scale on the meter.
- ☐ Read AND record "**SMEAR + BKGD CPM**" on Form EP-31.
- ☐ Calculate AND record "**SMEAR CPM**". Subtract "**BKGD CPM**" from "**SMEAR + BKGD CPM**".
- ☐ Return, using tweezers, the smear or wipe with the planchet to its small paper envelope or plastic bag
- ☐ Remove the rubber gloves and place them in the bag designated for radiological trash.
- ☐ Repeat above steps for additional smears or wipes.
- ☐ Report the data on Form EP-31 to the Offsite Team Coordinator.

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### **Attachment 9.8**

## **Perform Continuous Exposure Reporting and Control Actions**

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- ☐ Use Form EP-3-ALL, ERO Log Sheet to record movement and activities conducted. Use the 10-Mile Emergency Planning Zone Wind Sector Map, Site Boundary Map, GPS Units and Street Atlases. Take note of any change in the frisker or survey meter that is located in the vehicle.

**NOTE:**

Attachments 9.10, 9.11, 9.12, 9.13 and 9.14 may be used to identify destination.

- ☐ Maintain radio or telephone communications with the Communicator / Offsite Team Coordinator in route between locations. Each Offsite Monitoring Team should contact the Offsite Team Coordinator at approximately thirty (30) minute intervals.
- ☐ Verify the Communicator / Offsite Team Coordinator has the position (e.g., "Offsite Team"), the name of the team (e.g., "Mobile One"), the names and the DLR numbers of the team members.
- ☐ Keep pertinent current information on Form EP-3-ALL, ERO Log Sheet.
  - Dosimeter readings (Note readings on Form EP-36)
  - Plant, radiological, and meteorological conditions
  - Monitoring requirements
  - Radiological, exposure controls
  - ALARA locations
  - Landmarks on the route shown on the maps and atlases; e.g., DLR sites, Reuter Stokes sites, schools, and intersections
- ☐ **IF** at an ALARA location, **THEN** remain there until directed otherwise by the Radiological Assessment Coordinator. Continue monitoring for radiation fields from the vehicle. Periodically ensure both the Offsite Team and the Offsite Team Coordinator/Communicator have current information. Note the current information on Form EP-31 and dosimeter readings on Form EP-36.
- ☐ **IF** directed to another location **THEN** return to the beginning of this Attachment.



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## **Attachment 9.9**

### **Perform Post-Field Monitoring Actions**

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- ☐ **IF** directed to deactivate; **THEN** continue below.
- ☐ Return to the designated EOF or Alternative TSC/OSC parking area or other location as directed by the Radiological Assessment Coordinator.
- ☐ Survey **AND** decontaminate the vehicle as directed by the Radiological Assessment Coordinator. Document results on Form EP-31. Return samples for additional analysis.

#### **CAUTION:**

Ask the Dose Assessor to determine which, if any, samples are radioactive and implement radiological controls for those samples prior to removing them from the vehicle.

- ☐ Collect together the samples (i.e., filters, cartridges, smears) with the corresponding data forms.
- ☐ Ensure each sample is packaged, labeled and traceable to a data form.

#### **NOTE:**

Samples may be analyzed at the EOF, onsite by Chemistry or other radiological assessment facilities offsite. Non-radioactive samples may be shipped offsite using NEM procedures. Radioactive samples may be shipped offsite using Radiological Waste procedures.

- ☐ Request a disposition for the samples from the Radiological Assessment Coordinator.
- ☐ Turn samples over to the Dose Assessor or representatives from the RP, Chemistry, NEM or Radiological Waste organizations as directed by the Radiological Assessment Coordinator.
- ☐ Return equipment, materials and supplies.
- ☐ Use the appropriate portions of Form EP-AD-6-1, "EOF Inventory Checklist" and ensure kits are stocked.
- ☐ Read **AND** record dosimeter exposures on Form EP-3-ALL. Deliver DLRs and completed Forms to the Radiological Assessment Coordinator.

#### **NOTE:**

For drill purposes return DLRs to kits.



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### Attachment 9.9

## **Perform Post-Field Monitoring Actions**

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- ☐ Request assistance from the Dose Assessor to check, decontaminate **OR** package contaminated equipment.
- ☐ Check that the listed equipment is returned to the kit. Report missing equipment to the Radiological Assessment Coordinator **AND** replace missing equipment as directed. Return the kit to the storage location.
- ☐ Check that the equipment removed earlier is returned to the storage location. Report missing equipment **AND** replace as directed by the Radiological Assessment Coordinator.





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**Attachment 9.11**  
**Offsite Monitoring Locations**

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<u>Sector- Mile</u>	<u>Map Number (Grid) (1)</u>	<u>Location</u>	<u>Directions (off major roads from site)</u>
1-2	W-1 (B-5)	Roa Hook Rd., @ 0.1-0.2 mi. fm Bear Mt. Bridge Rd. (Radiation Monitor Sta. #1)	Rte. 9 North to Annsville Circle to Rtes. 6 & 202, Bear Mt. Bridge Rd. West. <b>Left</b> to Roa Hook Rd.
	* W -14 (G-4)		
1-7	P-3 (B-9)	Route 9D North @ 3.3-3.4 mi. north of Bear Mt. Bridge. [I] (St. Francis Friary)	(See 1-2), Bear Mt. Bridge Rd. West to Bear Mt. Bridge. <b>Right</b> to Rte. 9D North.
	* P-1 (W-5)		
1-10	P-2 (C-7)	Route 9D North @ 0.2-0.3 mi. north of Bridge over Indian Brook. (Derham X Rd.)	Rte. 9 North. <b>Left</b> to Rte. 403. <b>Right</b> to Rte. 9D North.
	* P-5 (R-7)		
2-2	W-1 (C-5)	Old Pemart Ave. along R.R. to dead-end @ fence. (TLD Site).	Rte. 9 North to Rte's 202& 6, Main St. <b>Right</b> to Main St. Exit. <b>Right</b> to Main St. toward river to bottom of hill. <b>Right</b> to Old Pemart Ave.
	* W - 14 (G-5)		
2-3	W-1 (C-4)	Highland Ave. @ [r] Sprout Brook Rd. (Truck Sales Room)	Rte. 9 North to Bear Mt. Pkwy. Ext. North, cross overpass, <b>Right</b> to Highland Ave. Exit. <b>Right</b> to Highland Ave.
	* W - 17 (F- 6)		
2-6	W-1 (D-2) also P-3 (D-10)	Rte. 13 (Sprout Brook Rd.) @ [I] Old Albany Post Rd. / [r] Canopus Hollow Rd.	Rte. 9 North, to Bear Mt. Pkwy Ext. North, <b>Right</b> to Division St. Exit. <b>Left</b> to Division St., to Oregon Rd. North. <b>Left</b> to Gallows Hill Rd. to Rte. 13 (Sprout Brook Rd.).
	* W - 17 (D-7)		
2-10	P-6 (E-8)	Canopus Hollow Rd. @ [r] Bell Hollow Rd.	(See 2-6), Rte. 13, Sprout Bk. Rd. / Rte. 15, Canopus Hollow Rd. North. <b>Left</b> to Horton Hollow Rd. North. <b>Left</b> to (again) Canopus Hollow Rd. North.
	* P-2 (T-15)		
3-1	W-2 (C-6)	Louisa St. @ R.R. Bridge.	Rte. 9A North. <b>Left</b> to Welcher Ave. <b>Right</b> to Lower South St. North. <b>Left</b> to Louisa St.
	* W - 14 (J-5)		

(1)

**Key For County Maps**

For each monitoring point's grid locations either the Haggstrom road  
atlases (top) or the Geographia atlases (bottom with \*) may be used which  
are shown by County map, page number and grid coordinates.

Legend: W =Westchester P= Putnam  
O = Orange R= Rockland



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<u>Sector- Mile</u>	<u>Map Number (Grid)</u>	<u>Location</u>	<u>Directions (off major roads from site)</u>
3-3	W-1 (D-5)	Horton Dr. @ Hillcrest Elementary School	Rte. 9 North to Bear Mt. Ext. North. <b>Right</b> to Carhart Ave. <b>Right</b> to Leda Drive. <b>Right</b> to Horton Dr.
	* W - 14 (G-7)		
3-6	W-1 (E-3)	Oregon Rd. @ [r] Rte. 21, Peekskill Hollow Rd.	Rte. 9 North to Bear Mt. Ext. North. <b>Right</b> to Division St. Exit. <b>Left</b> to Division St., to Oregon Rd. North.
	* W - 17 (E-9)		
3-10	P-6 (F-8)	Rte. 21, Peekskill Hollow Rd. @ [I] Tinker Hill Rd.	(See 3-6), <b>Right</b> to Rte. 21, Peekskill Hollow Rd.
	* P - 2 (U-21)		
4-1	W-2 (C-7)	Lower South St. [r] @ 0.1-0.2 mi. fm Welcher Ave. past A&P. (Englehardt Corp. Entrance)	Rte. 9A North. <b>Left</b> to Welcher Ave. <b>Right</b> to Lower South St. North.
	* W - 14 (K-5)		
4-3	W-2 (D-6)	Maple Ave. @ [I] Chapel Hill Dr. (Chapel Hill Estates)	Rte. 9A North. <b>Right</b> to Welcher Ave. <b>Left</b> to Washington St. <b>Right</b> to Hudson Ave. <b>Right</b> to Maple Ave.
	* W - 14 (J-7)		
4-6	W-11 (F-4)	Lexington Ave. @ [r] Townsend Rd.	Rte. 9 North to Bear Mt. Ext. North. <b>Right</b> to Rte. 6 Exit. <b>Left</b> to Rte. 6 East. <b>Right</b> to Lexington Ave.
	* W - 17 (G-10)		
4-10	W-11 (J-3)	Somerston Rd. @ [I] Carol Court	Rte. 9 North to Bear Mt. Ext. <b>Right</b> to Rte. 6 Exit. <b>Left</b> to Rte. 6 East. <b>Right</b> on Curry St. <b>Left</b> on Weskora Rd. <b>Left</b> on Somerston Rd.
	* W - 18 (E-16)		
5-2	W-2 (C-7)	McKinley St. @ [I] (former McKinley School).	Rte. 9A North. <b>Right</b> to Welcher Ave. <b>Left</b> on McKinley St.
	* W - 14 (K-5)		
5-4	W-2 (E-7)	Furnace Woods Rd. @ Maple Ave.	Rte. 9 South. <b>Right</b> to Montrose Exit. <b>Right</b> to Rte. 9A North. <b>Right</b> to Watch Hill Rd. <b>Left</b> to Furnace Woods Rd.
	* W - 14 (K-8)		
5-7	W-12 (G-7)	Hunterbrook Rd @ 0.3-0.4 mi North of Baptist Church Rd. (Coaxial Crossing #571)	Rte. 9 South. <b>Right</b> to Rte. 129 Exit. <b>Left</b> to Municipal Pl. <b>Left</b> to Rte.129, Maple St. North. <b>Left</b> to Hunterbrook Rd.
	* W - 14 (K-12)		
5-10	W-12 (J-7)	Hanover St. @ Moseman Rd. (St. Patrick's School)	Rte. 9 South. <b>Right</b> to Rte. 129 Exit. <b>Left</b> to Municipal Pl. <b>Left</b> to Rte.129, Maple St. North. <b>Left</b> to Underhill Ave. <b>Right</b> to Hanover St.
	* W - 15 (K-16)		



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6-1	W-2 (C-7)	Rte. 9A @ Tate Ave. Westchester Industrial Park	Rte. 9A South to Tate Ave.
	* W - 14 (K-5)		
6-3	W-2 (D-8)	Watch Hill Rd. @ [l] Mountainside Tr.	Rte. 9A South. <b>Left</b> on Watch Hill Rd.
	* W - 14 (L-8)		
6-7	W-12 (F-9)	Rte. 129 North @ Hunter Brook Bridge	(See 5-10), Rte.129, Maple St. North.
	* W - 14 (N-11)		
6-10	W-13 (J-10)	Rte. 134 @ Rte. 100	Rte. 9 South. <b>Left</b> to Rte. 9A South. <b>Left</b> to Rte. 134, Croton Dam Rd.
	* W - 12 (P-16)		
7-1	W-2 (B-7)	Westchester Ave. @ [l] 1 <sup>st</sup> St.	Rte. 9A South. <b>Right</b> to Tate Ave. <b>Right</b> to Westchester Ave.
	* W - 14 (L-5)		
7-4	W-2 (D-9)	Watch Hill Rd. @ [l] Westminster Dr.	(See 5-4), <b>Right</b> to Watch Hill Rd.
	* W - 14 (M-7)		
7-6	W-3 (E-11)	Cleveland Dr. @ [r] Hughes St.	(See 5-10), Rte.129, Maple St. North. <b>Right</b> to Old Post Rd. South. <b>Left</b> to Cleveland Dr.
	* W - 11 (P-9)		
7-10	W-4 (G-13)	North State Rd. @ Ryder Ave.	Rte. 9 South. <b>Left</b> to Rte. 9A South. <b>Left</b> to North State Rd.
	* W - 9 (U-13)		
8-1	W-2 (B-7)	Westchester Ave. @ (Buchanan Verplanck Elementary School)	(See 7-1), Westchester Ave. past 1 <sup>st</sup> St., between 4 <sup>th</sup> St. and Pheasant Run.
	* W - 14 (L-4)		
8-3	W-3 (C-9)	Crugers Station Rd. @ [r] Ripley Pl.	Rte. 9A South. <b>Right</b> to Crugers Station Rd.
	* W - 11 (N-7)		
8-7	W-3 (D-12)	Croton Pt. Ave. @ Fixed Air Sampling Sta.	Rte. 9 South. <b>Right</b> to Croton Pt. Ave. Exit. <b>Right</b> on Croton Pt. Ave.
	* W - 11 (R-7)		
8-10	W-4 (E-15)	Liberty St. @ Hudson St.	Rte. 9 South. <b>Right</b> to Revolutionary Rd. <b>Right</b> to Rockledge Ave. <b>Left</b> to Liberty St.
	* W - 9 (V-10)		
9-1	W-2 (B-8)	14 <sup>th</sup> St. @ James St.	(See 8-1), Westchester Ave. to 14 <sup>th</sup> St. Right to 14 <sup>th</sup> St.
	* W - 14 (L-4)		
9-3	W-2 (B-8)	Montrose Pt. Road @ End (outside George's Island Park)	Rte. 9A South. <b>Right</b> to Kings Ferry Rd. to Montrose Pt. Rd.
	* W - 14 (M-4)		



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9-7	R-6 (X-12)	Rte. 9W South @ Rte. 90, South Mountain Rd.	Bear Mt. Bridge West to Rte. 9W South.
	* R - 5 (J-13)		
9-10	R-9 (X-16)	Kings Highway North @ Old Mill Rd.	(See 9-7), Rte. 9W South. <b>Right</b> to Rte. 303. <b>Right</b> on Rockland Lake Rd. <b>Right</b> to Rte. 13, Casper Hill Rd. / Kings Highway North.
	* R - 2 (M-13)		
10-1	W-2 (B-8)	11 <sup>th</sup> St. @ Highland Ave. (Church)	Broadway South. <b>Right</b> to 11 <sup>th</sup> St
	* W - 14 (L-3)		
10-4	R-3 (W-8)	Grassy Point Rd. @ Beach Rd.	(See 1-2), Bear Mt. Bridge West to Rte. 9W/202 South. <b>Left</b> to Rte. 108, Main St. to Grassy Point Rd.
	* R - 6 (G-12)		
10-7	R-6 (T-12)	Central Highway / Little Tor Rd. @ Rte. 90, South Mountain Rd.	(See 1-2), Bear Mt. Bridge West to Rte. 9W/202 South. <b>Right</b> at Rte. 202 Westside Ave. <b>Left</b> to Rte. 33, Central Highway / Little Tor Rd.
	* R - 5 (J-10)		
10-10	R-8 (S-15)	West Clarkstown Rd. @ Palisades Pkwy. Overpass	Palisades Pkwy. South. <b>Right</b> to exit 11. <b>Left</b> to New Hempstead Rd. <b>Right</b> to West Clarkstown Rd.
	* R - 2 (M-10)		
11-1	W-2 (B-8)	9 <sup>th</sup> St. extension @ Radiation Monitor Sta. #11. (Lock combination required)	Broadway South. <b>Right</b> to 9 <sup>th</sup> St. past gate, between abandoned bunkers and transmission tower.
	* W - 14 (L-3)		
11-3	R-3 (U-7)	Adams Dr. @ Gilmore Dr.	(See 1-2), Bear Mt. Bridge West to Rte. 9W/202 South. <b>Right</b> to Adams Dr.
	* R - 6 (F-11)		
11-6	R-3 (S-9)	Willow Grove Rd. @ Knapp Rd.	Palisades Pkwy. South. <b>Right</b> to Exit 14. <b>Left</b> to Willow Grove Rd.
	* R - 5 (G-10)		
11-10	R-5 (N-13)	Wilder Rd. @ Rte. 202 (Haverstraw Rd.)	Palisades Pkwy. South. <b>Right</b> to Exit 13. <b>Right</b> to Rte. 202 South, to Rte. 202 (Haverstraw Rd.) <b>Left</b> to Wilder Rd.
	* R - 4 (K-7)		



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12-2	R-3 (V-6)	Rte. 9W/202 @ south end of West Shore Dr.	(See sector 1-2) Bear Mt. Bridge West to Rte. 9W/202 South. to south end of West Shore Dr. (formerly Gays Hill Rd.)
	* R - 6 (E-12)		
12-4	R-3 (T-7)	Franck Rd. @ Richard C. Brown Dr.	Palisades Pkwy. South. <b>Right</b> to Exit 15. <b>Right</b> on Rte. 106, Old Gate Hill Rd. to Cedar Pond Rd. <b>Left</b> to Bultontown Rd. <b>Right</b> to Franck Road.
	* R - 6 (E-11)		
12-7	R-3 (Q-7)	Lake Welch Dr. @ Sewage Plant.	Palisades Pkwy. South. <b>Right</b> to Exit 16. <b>Right</b> to Lake Welch Drive (Road closed during winter months).
	* R - 6 (E-9)		
12-10	R-2 (K-9)	Lake Welch Dr. @ Seven Lakes Dr.	(See 12-7) continue on Lake Welch Drive. (Road closed during winter months).
	* R - 3 (Insert B)		
13-2	R-1 (V-5)	Rte. 9W/202 @ north end of West Shore Dr.	(See 1-2) Bear Mt. Bridge West to Rte. 9W/202 South. <b>Left</b> to north end of West Shore Dr. (formerly Gays Hill Rd.)
	* R - 6 (D-12)		
13-3	R-3 (U-5)	Mott Farm Rd @ entrance to Camp Addison Boyce. (Lake Bullowa).	(See 1-2) Bear Mt. Bridge West to Rte. 9W/202 South. <b>Right</b> to Rte. 118A. <b>Right</b> to Rte. 118, Mott Farm Rd.
	* R - 6 (E-12)		
13-9	O-21 (W-16)	Arden Valley Rd. @ Arden Rd./ Bailey Town Rd.	Palisades Pkwy. South. <b>Right</b> to Exit 18 to Seven Lakes Dr. to Lake Tiorati Circle to Arden Valley Rd. West.
	* O - 22 (WW-33)		
14-2	R-1 (W-4)	Thunder Mt. Rd. @ Radiation Monitor Sta. #14	(See 1-2) Bear Mt. Bridge West to Rte. 9W/202 South. <b>Right</b> to Thunder Mt. Rd.
	* R - 6 (D-12)		
14-6	O-18 (Z-14)	Rte. 6 @ 1.0 mi. West of Palisades Pkwy	Palisades Pkwy. South. <b>Right</b> to Exit 18. Continue to Rte. 6 West.
	* O - 21 (BBB-30)		





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14-10	O-17 (X13)	Rte. 9, Smith Clove Rd. North @ NYS Twy. Overpass.	(See 14-6) Continue on Rte. 6 West. <b>Right</b> to Averill Ave. Continue on Rte. 32 North. <b>Right</b> to Rte. 9, Smith Clove Rd. North.
	* O - 21 (WW-28)		
15-1	R-1 (W-4)	Rte. 9W/202 @ Anchor Monument. (Directly across from Indian Point).	(See 1-2), Bear Mt. Bridge West to Rte. 9W/202 South.
	* R - 6 (D-13)		
15-4	R-1 (U-2)	Rte. 9W/202, 0.5 mi. south of bridge @ Bear Mount Inn.	(See 1-2), Bear Mt. Bridge West to Rte. 9W/202 South. <b>Right</b> to Bear Mountain Inn.
	* R - 3 (Insert A)		
15-6	O-18 (AA-13)	Mine Rd. @ Weyants Pond Rd.	(See 1-2), Bear Mt. Bridge West to Rte. 9W North. <b>Left</b> to Old Rte. 9W (Firefighter's Mem. Dr.). <b>Left</b> to Mine Rd.
	* O - 21 (DDD-28)		
15-10	O-18 (Y-12)	Smith Clove Rd. @ Trout Brook Rd. / Mineral Springs Rd.	(See 14-6), Continue on Rte. 6 West. <b>Right</b> to Averill Ave. Continue on Rte. 32 North. <b>Right</b> to Rte. 9, Smith Clove Rd. North.
	* O - 16 (YY-25)		
16-1	R-1 (X-4)	Ayers Rd @ Radiation Monitor Sta. #16.	(See 1-2), Bear Mt. Bridge West to Rte. 9W/202 South. <b>Left</b> to Ayers Rd (Old Rte. 9W).
	* R - 6 (D-13)		
16-4	R-1 (U-1)	Bear Mt. Bridge @ west end, (traffic circle).	(See 1-2), Bear Mt. Bridge Rd. West to Bear Mt. Bridge West.
	* W-17 (E-1)		
16-6	O-18 (BB-13)	Morgan's Farm Rd. @ 0.7-0.8 Mi. West of Cragston Lakes.	(See 16-4), Bear Mt. Bridge West to Rte. 9W North. <b>Right</b> to Exit. <b>Left</b> to Rte. 218, to Morgan's Farm Rd.
	* O - 16 (FFF-26)		
16-9	O-18 (BB-11)	Rte. 9W @ Rte. 293	(See 16-4), Bear Mt. Bridge West to Rte. 9W North to Rte. 293.
	* O - 16 (EEE-23)		

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<b>Monitor Number</b>	<b>Location</b>	<b>County</b>
1	Roa Hook Road & Cortlandt Town Garage	Westchester
2	Annsville Circle/Intersection of Route 6 and Route 9 Cortlandt	Westchester
3	Hudson Street & Railroad Avenue Peekskill	Westchester
4	Lower South Street. Peekskill	Westchester
5	South Street & Welcher Avenue, Buchanan	Westchester
6	Broadway, Buchanan	Westchester
7	Broadway at Entrance to Service Center, Buchanan	Westchester
8	Broadway across from Unit 3 entrance, Buchanan	Westchester
9	Broadway & St. Patrick's Cemetery, Verplanck	Westchester
10	11 <sup>th</sup> . Street & Highland Avenue, Verplanck	Westchester
11	End of 9 <sup>th</sup> . Street/ West side of Quarry, Verplanck	Westchester
12	Route 9W & Gays Hill Road, Stony Point	Rockland
13	Route 9W & Gays Hill Road North, Stony Point	Rockland
14	Route 9W & Thunder Mountain Road, Stony Point	Rockland
15	Route 9W, Jones Point	Rockland
16	Ayers Road, Jones Point	Rockland



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<u>Longitude</u>	<u>Latitude</u>	<u>GPS Location Designation</u>	<u>Location</u>
-73.94767	41.29833	S1-M2	Roa Hook Road
-73.95872	41.31253	S1-M3	Military Road
-73.95562	41.32737	S1-M4	Military Road
-73.95732	41.34182	S1-M5	SR-9d/Bear Mountain Beacon Highway
-73.95297	41.35628	S1-M6	SR-9d/Bear Mountain Beacon Highway
-73.96911	41.36984	S1-M7, W	SR-218/Bear Mountain Beacon Highway
-73.94713	41.37072	S1-M7	SR-9d/Bear Mountain Beacon Highway
-73.96509	41.38481	S1-M8, W	Fenton Place
-73.94703	41.38518	S1-M8	Philipse Landing
-73.96291	41.39959	S1-M9	Upton Road
-73.93302	41.39898	S1-M9, E	SR-9d/Bear Mountain Beacon Highway
-73.95708	41.41413	S1-M10, E	Market Street
-73.97219	41.41328	S1-M10, W	SR-218/Storm King Highway
-73.93453	41.29556	S2-M2	Old Pemart Avenue
-73.9309	41.3101	S2-M3	US-9/Albany Post Road/ CR-306
-73.92819	41.32471	S2-M4	US-9/Albany Post Road/CR-306
-73.91506	41.33645	S2-M5	Upland Drive
-73.90688	41.34955	S2-M6	Old Albany Post Road
-73.90214	41.36373	S2-M7	Old Albany Post Road
-73.89566	41.37736	S2-M8	Old Albany Post Road
-73.88383	41.3893	S2-M9	Canopus Hill Road/ Canopus Hill
-73.88109	41.38844	S2-M9	Canopus Hill Road/ Canopus Hill
-73.87298	41.40155	S2-M10	South Highland Road/ Highland Road
-73.93616	41.27838	S3-M1	CR-155/Louisa Street
-73.92418	41.28995	S3-M2	Central Avenue
-73.91147	41.30082	S3-M3	Frost Lane
-73.89579	41.30943	S3-M4	Locust Avenue
-73.88661	41.32299	S3-M5	Oregon Road
-73.87224	41.3326	S3-M6	Peekskill Hollow Turnpike



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-73.85761	41.34202	S3-M7	Boys Camp Road
-73.84244	41.35102	S3-M8	CR-21/Peekskill Hollow Road
-73.83322	41.36456	S3-M9	CR-21/Peekskill Hollow Road
-73.81264	41.36944	S3-M10	Barger Street
-73.93415	41.27601	S4-M1	Lower South Street
-73.91695	41.28244	S4-M2	Robin Drive
-73.8979	41.2856	S4-M3	Buttonwood Avenue
-73.88088	41.2924	S4-M4	US-202/Crompond Road/SR-35
-73.86359	41.29873	S4-M5	School Road
-73.84664	41.30567	S4-M6	Sylvan Road
-73.83351	41.31804	S4-M7	Stoney Street
-73.81069	41.31579	S4-M8	Strang Boulevard
-73.79165	41.31887	S4-M9	Gomer Street
-73.77506	41.3265	S4-M10	Driveway
-73.93241	41.26946	S5-M1	McGuire Avenue
-73.8938	41.27098	S5-M3	Pleasantide Road
-73.87465	41.26829	S5-M4	Maple Avenue
-73.8555	41.26691	S5-M5	Maple Avenue
-73.83651	41.27619	S5-M6	Hunter Brook Road
-73.81731	41.27687	S5-M7	Taconic State Parkway
-73.79854	41.25862	S5-M8	CR-131/Underhill Avenue/Turkey Mountain Ave.
-73.77973	41.28321	S5-M9	US-202/Saw Mill River Road/SR-35/SR-118
-73.761	41.2868	S5-10	SR-35/Amawalk Road
-73.93321	41.26469	S6-M1	US-9/Briarcliff Peekskill Parkway
-73.91547	41.25922	S6-M2	Washington Street
-73.89935	41.25084	S6-M3	Flanders Lane
-73.86466	41.23849	S6-M5	Colabaugh Pond Road
-73.84433	41.23679	S6-M6	SR-129/Yorktown Road
-73.82415	41.23671	S6-M7	Croton Dam Road



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<u>Longitude</u>	<u>Latitude</u>	<u>GPS Location Designation</u>	<u>Location</u>
-73.81237	41.22047	S6-M8	Taconic State Parkway
-73.79171	41.22024	S6-M9	SR-134/Kitchawan Road
-73.77188	41.21854	S6-M10	SR-100/RT-100/Somerstown TK/Saw Mill Ri Rd
-73.93918	41.25831	S7-M1	Henry Street
-73.92418	41.24908	S7-M2	US-9/Briarcliff Peekskill Parkway
-73.91014	41.23923	S7-M3	Westminster Drive
-73.90105	41.22569	S7-M4	
-73.88153	41.21991	S7-M5	Glengary Road
-73.85518	41.19892	S7-M7	Glendale Road
-73.84096	41.1892	S7-M8	Grace Lane
-73.83162	41.17585	S7-M9	Brookside Lane
-73.8152	41.16777	S7-M10	SR-100/Saw Mill River Road
-73.94353	41.25629	S8-M1	Tate Avenue
-73.93895	41.24208	S8-M2	Sunset Road
-73.92388	41.23138	S8-M3	Cortlandt Street
-73.91221	41.21975	S8-M4	US-9/Briarcliff Peekskill Parkway
-73.88757	41.19711	S8-M6, E	Half Moon Bay Drive
-73.89637	41.17711	S8-M7	Croton Road
-73.87203	41.17125	S8-M8	Beach Road/Brayton Park
-73.91418	41.14232	S8-M9, W	CR-80/Rockland Lake Road
-73.86092	41.15862	S8-M9	US-9/Highland Avenue
-73.86147	41.14174	S8-M10	US-9/South Highland Avenue/Albany Post Road
-73.95189	41.25505	S9-M1	Westchester Avenue
-73.94829	41.24065	S9-M2	Montrose Point Road
-73.96099	41.19754	S9-M5	Liberty Street
-73.95553	41.18276	S9-M6	US-9W/S 9/Congers Avenue
-73.9569	41.16831	S9-M7	SR-304
-73.95273	41.15383	S9-M8	CR-80/Congers Road/Congers Lake Road
-73.95544	41.13938	S9-M9	Waters Edge



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<u>Longitude</u>	<u>Latitude</u>	<u>GPS Location Designation</u>	<u>Location</u>
-73.95863	41.12493	S9-M10	Old Mill Road
-73.95779	41.25588	S10-M1	11 <sup>th</sup> Street & Broadway
-73.97662	41.23048	S10-M3	CR-110/Beach Road
-73.98644	41.21802	S10-M4	US-9W/S Liberty Drive/US-202
-73.98357	41.20132	S10-M5	US-9W/S (W/Conger Avenue/US-202
-73.98863	41.18726	S10-M6	South Mountain Road/South Mountain Road
-74.00396	41.17642	S10-M7	CR-33/North Little Tor Road
-74.00504	41.16108	S10-M8	CR-33/North Little Tor Road
-74.01475	41.14848	S10-M9	CR-80/New Hempstead Road
-74.03562	41.1394	S10-M10	SR-45/North Main Street
-73.99196	41.23884	S11-M3	Miller Drive
-74.00488	41.22814	S11-M4	CR-47/Thiells Road
-74.02051	41.21951	S11-M5	CR-98/Willow Grove Road
-74.03122	41.20712	S11-M6	Wilbur Avenue
-74.04548	41.19745	S11-M7	Tamarack Lane
-74.05223	41.1822	S11-M8	US-202/Haverstraw Road
-74.07514	41.17897	S11-M9	US-202/Haverstraw Road
-74.08944	41.16932	S11-M10	US-202/Haverstraw Road
-73.98469	41.2553	S12-M2	US-9W/ North Liberty Drive/US-202
-74.00733	41.25968	S12-M3	Skahen Drive/Fowler Drive
-74.02295	41.24891	S12-M4	CR-69/Cedar Flats Road
-74.03566	41.23519	S12-M5	CR-106/Gate Hill Road
-74.05344	41.22952	S12-M6	CR-106/Gate Hill Road
-74.0735	41.22762	S12-M7	CR-106/Gate Hill Road
-74.0981	41.23595	S12-M8	CR-106/Kanawauke Road
-74.1173	41.23417	S12-M9	CR-106
-74.136	41.231	S12-M10	CR-106
-73.98964	41.26845	S13-M2	Maple Place
-74.00825	41.2635	S13-M3	CR-118/Mott Farm Road



**Attachment 9.13**  
**GPS Monitoring Locations**  
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<u>Longitude</u>	<u>Latitude</u>	<u>GPS Location Designation</u>	<u>Location</u>
-74.04471	41.25577	S13-M5	Palisades Interstate Parkway
-74.08545	41.27404	S13-M7	Tiorati Brook road
-74.10461	41.27443	S13-M8	Arden Valley Road
-74.12367	41.27902	S13-M9	Arden Road
-74.14296	41.27104	S13-M10	Clove Furnace Drive
-74.03501	41.30476	S14-M5	US-6/Seven Lakes Drive
-74.05109	41.31268	S14-M6	US-6
-74.06732	41.32041	S14-M7	US-6
-74.08917	41.32071	S14-M8	US-6
-74.11484	41.31188	S14-M9	US-6
-74.12351	41.33378	S14-M10	SR-32/Albany Turnpike
-73.96343	41.28072	S15-M1	US-9W/North Liberty Drive/US-202
-73.97286	41.29348	S15-M2	US-9W/North Liberty Drive/US-202
-73.9917	41.30039	S15-M3	Lemon Road
-74.00798	41.30858	S15-M4	7 Lakes Drive
-74.01565	41.32322	S15-M5	West Point
-74.01702	41.32219	S15-M5	West Point
-74.01854	41.32106	S15-M5	West Point
-74.02024	41.33898	S15-M6	Mine Road
-74.04863	41.33928	S15-M7	Stillwell Lake Trail
-74.07387	41.3391	S15-M8	Bull Pond Road
-74.07616	41.35944	S15-M9	West Point
-74.08834	41.37071	S15-M10	CR-34/Trout Brook Road
-73.96003	41.28241	S16-M1	Old Route 9W/Old Ayers Road
-73.97065	41.29449	S16-M2	Old Route 9W
-73.96536	41.31158	S16-M3	US-6/US-202/Bear Mountain Bridge Road
-73.97207	41.3252	S16-M4, E	SR-9D/Bear Mountain Beacon Highway
-73.97801	41.33898	S16-M5	US-9W/SR-218
-74.00757	41.3452	S16-M6	North Deep Hollow Road



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<u>Longitude</u>	<u>Latitude</u>	<u>GPS Location Designation</u>	<u>Location</u>
-73.99979	41.36392	S16-M7	North Deep Hollow Road
-74.00351	41.3784	S16-M8	North Deep Hollow Road
-74.01507	41.39046	S16-M9	Bog Meadow Road
-74.0134	41.4066	S16-M10	Bog Meadow Road





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**Attachment 9.14**

**Sampling Point – Distance and Locations**

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Sector	Wind Direction from (DEG)	Site Boundary Distance	Verify. Point Distance	CLs From True #	Verify. Point Location	Reuter Stokes Distance	Reuter Stokes Location
1N	169-190	2977m	3749m	0	Rt.202 & Rt. 6	3226	Bear Mt. Rd. near Old Stone on Hudson
2NNE	191-213	3234m	3331m	22	Rt. 202 & Rt. 6	3379	Annsville Circle Texaco Station
3NE	214-235	716m	1158m	45	West. Co Power Plant	2574	Hudson Street & Railroad Station
4ENE	236-258	701m	1094m	67	Broadway	1448	Lower South St Near West Iron
5E	259-280	762m	724m	90	Broadway	1287	Lower South St By Bypass Diner
6ESE	281-303	625m	609m	110	Broadway	643	Broadway
7SE	304-325	610m	617m	135	Broadway	643	Broadway
8SSE	326-348	701m	716m	157	Broadway	804	Broadway
9S	349-101	006m	949m	180	Service Rd to Georgia Pacific	1126	Broadway
10SSW	11-33	1006m	1030m	202	Service Rd to Georgia Pacific	1287	11 <sup>th</sup> . Street and Highland
11W	34-55	488m	611m	225	Georgia Pacific Corp. Prop.	1287	Trap Rock at end of 9 <sup>th</sup> . Avenue
12WSW	56-78	2349m	2494m	247	Rt. 9W	2494	Gays Hill Rd.
13W	79-100	1802m	1834m	270	Gays Hill Road	1870	Gays Hill Rd.
14WNW	101-123	1689m	1786m	292	Rt. 9W	1870	Rt. 9W
15NW	124-145	1432m	1529m	315	Rt. 9W	1648	Rts.9W & 202
16NNW	146-168	1416	1512m	337	Ayers Road	1770	Ayers Road

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## **Attachment 9.15**

### **Radiological Field Monitoring Discussion**


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#### **DISCUSSION**

- ❑ The purpose of radiological monitoring is to find and define a plume of radioactive airborne contamination and any surface contamination left in the wake of a plume.
- ❑ Monitoring activities include detecting beta radiation, measuring gamma radiation and sampling airborne and surface contamination.
- ❑ Monitoring data is reported to the EOF and may be used by the ERO to determine emergency action levels, emergency classifications, radiological exposure controls, protection for on-site personnel and emergency workers, and protective action recommendations for the general public.
- ❑ Offsite Monitoring Team Members will be notified of a declared emergency at either Unit 2 or Unit 3 and directed to report to the Emergency Operations Facility (EOF). They are expected at the EOF within the 60 minutes following the declaration.
- ❑ At the EOF, Offsite Monitoring Team Members report to the Radiological Assessment Coordinator for assignment to the 1<sup>st</sup> or 2<sup>nd</sup> shift teams.

#### **PRECAUTIONS AND LIMITATIONS**

- ❑ Continually review and practice the prescribed radiological exposure controls.
- ❑ Avoid cross contamination of samples and equipment.
- ❑ When Open window vs Closed window is  $\geq 1.5$  you are in the plume.
- ❑ Each Offsite Monitoring Team is composed of members from those whose names are listed in the Emergency Telephone Directory.
- ❑ Onsite Teams from the OSC monitor inside the Protected Area fence within and around the Site Boundary. Offsite Monitoring Teams monitor outside this boundary.
- ❑ Emergency Sampling Point locations are listed in Attachments 9.11, 9.13 and 9.14 of this procedure.
- ❑ Vehicles are checked and decontaminated as prescribed in this procedure.
- ❑ The Dose Assessor (DA) in the EOF assures radiological controls are implemented for samples, equipment, materials, supplies and personnel in the EOF.
- ❑ Qualified Nuclear Environmental Monitoring (NEM) Technicians change DLRs and air sampling station filters at fixed sites within the 10 Mile EPZ, submit the DLRs and filters for analysis, sample soil and water and perform other activities prescribed in the station NEM Procedures.

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### Attachment 9.15

## **Radiological Field Monitoring Discussion**

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### EQUIPMENT AND MATERIALS

- ❑ Equipment and material for the Offsite Monitoring Teams are at the EOF in a storage location behind the south wall in the east stairwell near the foot of the stairs.
- ❑ A key for the storage location is inside the key locker on the west wall of the Emergency Operations Facility (EOF) near the EOF Information Liaison station. Another key is inside the red key box outside, near the entry door to the ECC, on the east wall.
- ❑ Equipment and material include three complete sets of monitoring kits. Each set has two sealed cases, A and B. Case A is for plume survey/sampling; Case B is for REMP sampling only.
- ❑ Three vehicles, with mobile radio and cellular phone, are available for the Offsite Monitoring Teams. The keys are inside the storage location in the stairwell. Two of these vehicles are at the Buchanan Service Center (EOF parking lot), and one is located at the Verplanck Fire Department, 238 8<sup>th</sup> Street, Verplanck.
- ❑ Vehicles are equipped with 12 VDC/125 VAC inverters.
- ❑ Additional equipment is also available in the EOF storage location:
  1. Potassium Iodide (KI)
  2. Batteries, "D" size
- ❑ Offsite Monitoring Team Position Binders with procedures and forms are available in the EOF Conference Room.
- ❑ The cellular phones and GPS Units for use in the vehicles are available in the room next to the telephone room near the west entrance to the EOF.
- ❑ Numbers for telephone extensions in the EOF and cellular phones in the vehicles are listed in the Emergency Telephone Directory.


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### **Attachment 9.15**

## **Radiological Field Monitoring Discussion**

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- The IPEC Radio Service has 16 modes of operation. The service includes two radio repeaters with fixed, mobile and portable radio control stations. Seven (4, 5, and 9 -13) modes are available with the mobile radios in the vehicles.
  1. Mode 4, "Onsite": Repeater coverage for the IPEC to 2-3 miles around the Site. Stations: EOF, U2CCR, U3CCR, and vehicles.
  2. Mode 5, "Offsite": Repeater coverage for the IPEC to 5-10 miles around the Site. Stations: AEOF, EOF, U2CCR, U3CCR, portables and vehicles.
  3. Modes 9 -13, "Talk-around": Line-of-sight coverage between fixed, mobile and portable radios. Stations: portables and vehicles.

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**Attachment 9.16  
Offsite Team Coordinator Checklist  
Sheet 1 of 5**

**1.0 Initial Responsibility/Activity**

**NOTES**

**1.1 Follow Responsibility/Activities in EN-EP-609  
Attachment 9.9 and the following:**

**1.2 Assume the position of Offsite Team Coordinator.**


**A. IF it is the initial activation of position THEN:**

1. Inform the Radiological Assessment Coordinator and Dose Assessor(s) that you are now Offsite Team Coordinator.
2. **WHEN** there are 4 Offsite Monitoring Team members present, establish two Offsite Monitoring Teams.  
**WHEN** two additional Offsite Monitoring Team members arrive, form an Onsite Monitoring Team or another Offsite Monitoring Team at a location designated by the Radiological Assessment Coordinator.

**NOTE**

If for any reason the Entergy Offsite Monitoring Teams cannot be dispatched, contact Westchester County to assess status of their teams. Coordinate monitoring strategy with the county if possible. Contact with Westchester County can be accomplished through the Dose Assessment Conference Bridge or through the Westchester County representative at the EOF.

3. **IF** additional personnel are needed **THEN** inform the Radiological Assessment Coordinator or EOF Manager and request additional personnel.
4. Conduct a briefing with the Offsite Monitoring Teams. If available, consider using an adjacent room for the briefing, using the guidance in **Attachment 9.4 of this procedure.**

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**Attachment 9.16  
Offsite Team Coordinator Checklist  
Sheet 2 of 5**

**Initial Responsibility/Activity (cont.)**

**NOTES**

**NOTE:**

Offsite Monitoring Teams (OMTs) play a key role in the coordination of the State and local Counties Emergency Plans/Actions. It is an IPEC EXPECTATION to have the OMTs briefed and in the field as-soon-as-possible (i.e. within ~ 30- 45 minutes of their arrival at the EOF).

**1.3 Initial Offsite Team Briefing**

- A. Prior to dispatching teams into the field, brief them using **Attachment 9.4 of this procedure.**
- B. **IF** manned, **THEN** Contact the ICP to inform them of the OMT departure.

**1.4 Use of the Offsite Radio Using the Radio Headset or Phone Handset**

- A. Can be used with either the stationary radio handset or a headset.
- B. Headset is in the desk drawer near the console.
- C. Unplug the handset cord from the phone unit and plug into the jack-box to the left of the radio handset. Remove handset from cradle (refer to job aid provided on OTC desk and in position binder).
- D. Transmission can be completed using the "Transmit" button on the headset Push to talk (PTT); release to listen.
- E. IF the headset is used, it is advised that the console microphone be moved out of the way to avoid any interference.



**Attachment 9.16**  
**Offsite Team Coordinator Checklist**  
Sheet 3 of 5

**Initial Responsibility/Activity (cont.)**

- F. If using the handset, replace the handset in the phone cradle, unplug the cord from the jack-box and plug into the handset.
- G. Transmission can be completed with the handset by using the "Transmit" button on the Push to talk (PTT); release to listen.

**2.0 Continuous Responsibility/Activity**

**2.1 Transmit directions to the Offsite Monitoring Teams**

**NOTE**

Teams should be designated as Mobile 1, 2 etc. and Site Perimeter Team


- A. Use the Vehicle OnStar, radio or cell phones to communicate with teams.
- B. Confer with the Radiological Assessment Coordinator and/or Dose Assessors to determine the sample points and the expected whole body exposure rates based on dose projections.

**NOTE**

Be sure to dispatch Offsite Monitoring Teams to monitor the plume centerline and both sides of anticipated plume if practical.

- C. Enter selected sample point(s) and assigned team on Monitoring Team Radiation Field Survey Data (Form EP-30).
- D. Contact each team and direct them to the designated sample point providing following information:
  - 1. The expected dose rates.
  - 2. Methods of traversing the plume to keep their exposure as low as possible, such as going around plume or traveling through low field areas.
- E. Have teams verify instructions by repeating them back.

**NOTES**

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**Attachment 9.16**  
**Offsite Team Coordinator Checklist**  
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**Continuous Responsibility/Activity (cont.)**

**NOTES**

**2.2 Receive and Record Offsite Monitoring Team Data**

- A. Have teams state sample point for which data is being transmitted.
- B. Record survey data on Monitoring Team Radiation Field Survey Data and Monitoring Team Sample Data (Form EP-30 and Form EP-31).
- C. Verify numbers by repeating values back to the team.
- D. Inform the Radiological Assessment Coordinator or Dose Assessor immediately of survey and sample results.

**2.3 Determine Radioactive Airborne Concentrations**

**WHEN** Offsite Monitoring Teams report air sample results  
**THEN** determine airborne concentrations as follows:

- A. Use (Form EP-32), Determination of Radioactive Airborne Concentrations to calculate  $\mu\text{Ci/cc}$ .
- B. Report concentration to Dose Assessor or Radiological Assessment Coordinator.


**2.4 Maintain Offsite Monitoring Team Exposure Records.**

- A. **IF** any exposure rates are above background **THEN** obtain team member whole body exposure (dosimetry readings).
- B. **IF** any team members are receiving radiological exposures **THEN** record exposures on Individual Exposure Tracking Log (Form EP-36) periodically.

**2.5 Keep Offsite Monitoring Teams informed of major changes in emergency status:**

- Changes in emergency classification
  - Start or stop of any offsite releases of radioactive materials.
- A. Communications **SHOULD** be within 30 minutes of a change in conditions.



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**Attachment 9.16  
Offsite Team Coordinator Checklist  
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**Continuous Responsibility/Activity (cont.)**

**NOTES**

- B. Routinely contact Offsite Monitoring Teams approximately every thirty minutes.

**2.6 Obtain new sample locations and points from  
Radiological Assessment Coordinator or Dose Assessor**

- A. Repeat above steps to continue plume tracking until Radiological Assessment Coordinator determines surveys and sampling are no longer necessary.

**2.7 To ensure continuous Offsite Monitoring capabilities,  
Coordinate the relief of Offsite Monitoring Team  
personnel, if required.**

- A. **IF** Offsite Monitoring Teams are deployed **AND** "In-Field" turnover of team personnel is required **THEN** utilize a spare vehicle, if available, or call the Offsite Monitoring Teams back to the EOF, Alternative TSC/OSC or AEOF, one team at a time, to facilitate turnover. The replacement team **SHOULD** be pre-briefed i.a.w step 1.3 and ready to immediately deploy when the off going team returns to the EOF, Alternative TSC/OSC or AEOF.

# IPEC EMERGENCY PLAN DISTRIBUTION LIST

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IP3 CONTROL ROOM	DELIVERED BY DOCUMENTS	IP3 53FT. CCR	1 COPY OF ALL EP'S
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NRC RESIDENT INSPECTOR	NRC	IP2 88FT. ELEVATION	1 COPY OF ALL EP'S
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