

March 8, 2011

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THE FOLLOWING PROCEDURE HAS BEEN REVISED, PLEASE REMOVE YOUR CURRENT COPY AND REPLACE WITH ATTACHED UPDATED PROCEDURE:

**IP-EP-320 REV.4**

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## Radiological Field Monitoring

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2/28/2011  
Date

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Brian Sullivan  
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3/1/11  
Date


March 17, 2011

*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).

### 2.0 REFERENCES

- 2.1 Indian Point Energy Center Emergency Plan
- 2.2 IP-EP-250, Emergency Operations Facility

### 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 – Field 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, Field Team Members report to the Offsite Radiological Manager (ORM) for assignment to the 1st or 2nd shift teams.
- 3.6 Onsite Monitoring – Radiological Monitoring performed within the Protected Area Boundary.
- 3.7 Field Monitoring – Radiological Monitoring performed outside the Protected and Owner Controlled Area Boundary.


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#### 4.0 RESPONSIBILITIES

- 4.1 The Shift Manager (SM) or the Emergency Plant Manager ( EPM ), in absence of the Offsite Radiological Manager ( ORM ), may direct Field Monitoring Teams from the Central Control Room (CCR).
- 4.2 Field Monitoring Teams are dispatched, directed, and controlled by a Field 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 Team Leader at the request of the ORM. Once the Onsite Monitoring Team has been dispatched, further direction will be administered by the ORM.

<u>Perimeter Sector</u>	<u>Position</u>	<u>Team</u>
2 - 11	ORM	Field Team
12,13,14,15,16,1	RPTL	RP 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 TLDs and air sampling station filters at fixed sites within the 10 Mile EPZ, submit the TLDs 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.
- 4.7 Use Form EP-10, Emergency Response Organization Log Sheet, to record Field Monitoring Team actions and activities.
- 4.8 Field Monitoring Teams will only use certain sections of procedure IP-EP-330, Airborne Sample Analysis.

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## 5.0 DETAILS

5.1 Field Monitoring Teams are to report to the ORM or designee to be assigned to a team.

5.1.1 **IF** assigned to a team for the current shift, **THEN** assure the names of the Team members are entered on the EOF Personnel Status Board **AND** continue with this procedure.

5.1.2 **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 ORM.

5.1.3 Each team, as a minimum, should consist of 2 members.

5.2 In the EOF, obtain equipment, materials and supplies:

5.2.1 Field Monitoring Team Position Binder

5.2.2 Keys for a vehicle (offsite Monitoring Kits storage location)

5.2.3 Vehicle with a radio and cell phone. Check the fluid levels

5.2.4 The following equipment and materials is available from the closet:

- Potassium Iodide (KI) package, 14 tablets with directions
- Monitoring Kit (two sealed cases, A and B, per kit)

5.2.5 Use ERO Log Sheet(s) ( Form EP-10) located in the Position Binder to record your activities.

5.2.6 Record the "***ERO Position:***" [and the Team Name e.g.; "Mobile One"] "***Date:***" and the team member [s] "***Name:***"[s] on Form EP-10

### **NOTE:**


A Field 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.

5.2.7 Check the seal on each case in the kit. **IF** the seal is broken, **THEN** inventory the equipment in that case. Record the "Kit #" and results on Form EP-AD-6-1 for the kits.

5.2.8 Complete " Comments ", " Inventory Performed BY " and the " Date " on Form EP-AD6-1.

5.2.9 Verify operation of the ion chamber, the count rate meter, and the air sampler using Attachment 9.1.



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- 5.2.10 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.
- 5.2.11 Assign TLD's to each Field Team member. Wear the TLD badge and dosimeters (0-500 mR and 0-5 R) on the chest between the waist and neck. Record the current "Time", TLD serial number and dosimeter readings for each Field Team member on ( Form EP-10).

**NOTE:**


Without an ORM in the EOF, Field Monitoring Teams may be directed through the Communicator in the CCR.

- 5.2.12 Using Attachment 9.1, Equipment Operational Checks, check operation of the mobile radio, cellular phone and other communication equipment in the vehicle such as On-Star with the Communicator who is dispatching and controlling the team. Record results on Form EP-10.

**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 AEOF.**

- 5.2.13 Complete "***Comments:***", "***Inventory Performed By:***" and the "***Date:***" on (Forms EP-AD6-1).
- 5.2.14 **IF** there has been a release of radioactive material to the atmosphere, **THEN** as directed by the ORM or the ED, check the vehicle for contamination **BEFORE** leaving the Site using Attachment 9.3, Performing Surface Contamination Checks.
- 5.2.15 Place the equipment, materials and supplies in the vehicle. Place the E-140N, the RO-2 and surgeon rubber gloves in the front seat.

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### 5.3 Receive briefing on emergency conditions.

5.3.1 Ensure that the Field Team Coordinator or designee has provided a Team designation (e.g., "Mobile One"), and has the names of the Team members along with their TLD numbers.

5.3.2 Review AND note conditions, monitoring locations, routes, and requirements with Field Team Coordinator or designee.

5.3.3 Plant conditions

5.3.4 Emergency classification

5.3.5 Plant status

5.3.6 Release conditions

- Release start
- Release stop
- Noble gas / Iodine ratio
- Expected dose rate, surface and airborne contamination.
- Current Reuters Stokes readings, if any

5.3.7 Measured and forecast meteorological conditions

- Wind direction
- Wind speed
- Pasquill stability class

5.3.8 Projected Plume location

- Width (sectors)
- Plume front (miles from center of wind sector)
- Plume characteristic (cross, down or up valley)


5.3.9 Areas, routes and locations, including Emergency Sampling Points to monitor

5.3.10 Monitoring requirements:

- Radiation fields in route.
- Radiation fields on location
- Airborne contamination
- Surface contamination

5.3.11 Review radiological exposure controls

- Minimize time (Goal: <15 min.) spent within elevated radiation fields especially those near or within the plume and/or its wake.

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- ALARA locations
- DO NOT enter a radiation field within a plume that is greater than 100 mR/hr except as directed by the ORM.

**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 1 R (i.e., dosimeter reading) except when directed by the ORM.

**NOTE:**

The Emergency Director, using Form EP-6, 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 Entergy's corporate policy for issuance of KI. If circumstances indicate that there would be no release or potential release of radioactive material that would affect the Emergency Response Organization ( ERO ) and/or risk of using KI outweighs the benefit, KI may not be used. Administration of KI will be considered at a projected child thyroid dose of 5 Rem CDE or more to the thyroid.

- DO NOT take KI except when directed by the ORM. Individuals who are allergic to shellfish should not take KI.


**5.4 Proceed as directed by the Communicator / Field Team Coordinator:**

- 5.4.1** Use Form EP-10, 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 9.4, 9.5, 9.7, 9.8,9.9 may be used to identify destination.

- 5.4.2** Maintain radio or telephone communications with the Communicator / Field Team Coordinator in route between locations. Each Field Monitoring Team should contact the Field Team Coordinator at approximately thirty (30) minute intervals.

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5.4.3 Verify the Communicator / Field Team Coordinator has the position (e.g., "Field Team"), the name of the team (e.g., "Mobile One"), the names and the TLD numbers of the team members.

5.4.4 Keep pertinent current information on Form EP-10, ERO Log Sheet.

- Dosimeter readings
- Plant, radiological, and meteorological conditions
- Monitoring requirements
- Radiological, exposure controls
- ALARA locations
- Landmarks on the route shown on the maps and atlases; e.g., TLD sites, Reuter Stokes sites, schools, and intersections

## 5.5 Radiological Monitoring

Upon arriving at assigned location:

5.5.1 Conduct radiological monitoring using Attachment 9.2.

5.5.2 When requested, conduct air sampling using IP-EP-330, Airborne Sample Analysis

5.5.3 When requested, conduct surface contamination checks using Attachment 9.3,

## 5.6 Prepare for reassignment.

5.6.1 Return the sampler and holder, the count rate meter and probe, the counting fixture and tweezers to the kit.

5.6.2 Return packaged samples to the vehicle.

5.6.3 **IF** at an ALARA location, **THEN** remain there until directed otherwise by the ORM. Continue monitoring for radiation fields from the vehicle. Periodically assure both the team and the Communicator has current information. Note the current information on Form IP-EP-30; **IF NOT**, continue below.


5.6.4 **IF** directed to another location **THEN** return to 5.4 and continue; **IF NOT**, continue below.

5.6.5 **IF** directed to deactivate; **THEN** continue below.

5.6.6 Return to the EOF parking area or other location as directed by the ORM.

5.6.7 Survey **AND** decontaminate the vehicle as directed by the ORM. Document results on Form EP-50.

5.7 Return samples for additional analysis.

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**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.

5.7.1 Collect together the samples (i.e., filters, cartridges, smears, and wipes) with the corresponding data forms.

5.7.2 Assure 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.

5.7.3 Request a disposition for the samples from the ORM.

5.7.4 Turn samples over to the DA or representatives from the Chemistry, NEM or Radiological Waste organizations as directed by the ORM.

5.8 Return equipment, materials and supplies.

5.8.1 Use the appropriate portions of Form EP-AD-6-1, "EOF Inventory Checklist" and assure kits are stocked.

5.8.2 Read **AND** record dosimeter exposures on Form EP-10. Deliver TLD's and completed Forms to the ORM. For drill purposes return TLD's to Kits.

5.8.3 Request assistance from the DA to check, decontaminate **OR** package contaminated equipment.

5.8.4 Check that the listed equipment is returned to the kit. Report missing equipment to the ORM **AND** replace missing equipment as directed. Return the kit to the closet.

5.8.5 Check that the equipment removed earlier is returned to the closet. Report missing equipment **AND** replace as directed by the ORM.

## **6.0 INTERFACES**

6.1 IP-EP-210, Central Control Room


6.2 IP-EP-250, 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

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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, (IP-EP-115 Form EP-10)
- 7.2 Monitoring Team Survey Data (IP-EP-115 Form EP-30)
- 7.3 Monitoring Team Sample Data (IP-EP-115 Form EP-31)
- 7.4 Surface Contamination Check (IP-EP-115 Form EP-50)

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

None

#### **9.0 ATTACHMENTS**

- 9.1 Equipment Operational Checks
- 9.2 Performing Radiological Field Monitoring
- 9.3 Performing Surface Contamination Checks
- 9.4 IPEC Site Map
- 9.5 Offsite Monitoring Locations
- 9.6 Radiological Field Monitoring Discussion
- 9.7 Reuter Stokes Locations
- 9.8 GPS Monitoring Locations
- 9.9 Sampling Points – Distance and Location



Attachment 9.1

**Equipment Operational Checks**

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**RO-2 Ion Chamber**

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

- ☐ Turn the function switch to "BATT 1" then to "BATT 2"; check the meter reads "BATT OK" for both positions. If not, replace battery(s).
- ☐ Turn the function switch to "ZERO"; use the "ZERO" knob and adjust the meter to read, "Zero".
- ☐ Turn the function switch to "5", open the shield, place unshielded chamber on the 5 uCi Cs-137 source; check the meter reads upscale greater than 1.0 mR/hr.
- ☐ Turn the function switch to "OFF" and close the shield.
- ☐ Instrument is operational

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

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

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

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

**RM-14/E-140N Count Rate Meter with HP 210 Probe**

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


- ☐ Connect the HP-210 probe with the coaxial cable; to the meter at the terminal marked "PROBE".
- ☐ Turn the function switch to "BATT"; check the meter reads "BATT OK". If not, replace battery.
- ☐ Turn the function switch at "X100", place probe in contact with 1 uCi Ba133 source, turn function switch to smaller multipliers until the meter reads upscale at more than 1000 CPM.
- ☐ Turn the Speaker switch to "ON". Ensure the speaker is operable when near the check source
- ☐ Turn the function switch to "OFF".
- ☐ Instrument is operational

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

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

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

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

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Attachment 9.1

## Equipment Operational Checks

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### H-809V-1 (AC) Air Sampler

#### **CAUTION:**

**Prior to turning the inverter on have the vehicle engine at idle speed. Turn the inverter off before turning the engine off.**

- ☐ Place sampler power switch "OFF"; remove the filter holder.
- ☐ Connect the sampler's power cord to the inverter receptacle.
- ☐ Turn the inverter "ON".
- ☐ Put power switch "ON". (Reset breaker for inverter if necessary).
- ☐ Check flow to assure 2 cubic foot per minute.
- ☐ Place the power switch "OFF".
- ☐ Turn the inverter "OFF".
- ☐ Disconnect the sampler from the inverter; replace the filter holder
- ☐ Instrument is operational

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

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

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

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

#### **IPEC Radio Service**

- ☐ Ensure the Field 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"
- ☐ Turn the "Mode Selector" switch to display "5...Offsite"
- ☐ 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"
- ☐ Continue radio check until successful communication with Indian Point EOF is accomplished or alternate method of communication is agreed upon.
- ☐ Record results on Form EP-10, ERO Log.

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

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





Attachment 9.1

**Equipment Operational Checks**

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**Other Equipment Operability Checks**

1. Check flashlight. Change batteries if necessary. Record results on Form EP-AD-6-1.
2. Verify operability of dosimeter charger if necessary.
3. TLD's" Due Date: \_\_\_\_\_
4. Zero dosimeters and verify Due Date: \_\_\_\_\_
5. Verify operability of vehicle by checking lights, spare tire, fluid level (including gas and oil) and tires. Document check on Form EP-10.

**Cellular Phone**

Put phone power on.  
Display "SERVICE AVAILABLE".  
Use the number in Emergency Telephone Directory for the Field Team Coordinator  
Call the Field Team Coordinator.  
If no contact, determine alternate means of communications in the event that the radio is inoperable.  
Record results on (Form EP-10) ERO Log.

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

Date \_\_\_\_\_

**OnStar- How to make a call using the OnStar telephone system:**


1. Press the phone button. When asked "OnStar" say "DIAL"
2. When asked "Please say the entire phone number to dial" say the entire number to dial without pausing.
3. OnStar will repeat the number ask "YES" or "NO"
4. If number is correct say "YES"; if not say "NO" to try again
5. OnStar responds with "OK, dialing". Your call will be placed.

**Each vehicle telephone number is identified in the vehicle.**

**GPS Units- How to Use. Locations are Pre- programmed.**

1. "Where to" icon on main screen
2. Select "Extras" icon
3. Select "POI Point of Interest".
4. Monitoring location can be identified by Sector and Mile, e.g. S1-M1, S2-M2. If not displayed, type desired location. See Attachment 9.8
5. Go.

**For non monitoring location type in desired address.**

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### Performing Radiological Field Monitoring

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1.0 Monitor radiation fields at landmarks in route to and on arrival at the location.

1.1 Begin with the E-140N, Count Rate Meter:

#### **NOTE:**

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

- 1.1.1 Put the function switch to "X1".
- 1.1.2 Lower the nearest window of the vehicle cab. Keep the Meter in the cab near the window.
- 1.1.3 Read AND record on Form 30 each doubling of the reading (CPM) and the nearest landmark including the reading on arrival at the location.
- 1.1.4 Report each doubling and landmark to the Communicator
- 1.1.5 WHEN the Rate Meter reads 1000 CPM at "X10" AND the Ion Chamber reads more than 0.1 mR/hr, THEN use the RO-2, Ion Chamber. [1000 CPM = 0.1 mR/hr (OW)]

#### **CAUTION:**


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

1.2 Continue with the RO-2, Ion Chamber.

#### **NOTES:**

As a plume of airborne contamination and the chamber approach, both the open window (OW) and closed window (CW) readings increase to reach a peak across the plume at the centerline and a maximum upwind at the release point.

Outside a plume, the OW readings are equal to the CW readings. Inside a plume, the OW readings are greater than the CW readings. (OW vs CW of  $\geq 1.5$ , you are in the plume).


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- 1.2.1 Lower the nearest window of the vehicle cab. Place the Ion Chamber in the cab near the window.
- 1.2.2 Set the function switch to "**5000 mR/hr**"; open the shield; turn the function switch to the lowest range without exceeding full scale on the meter.
- 1.2.3 Read AND record on Form 30 each doubling of the "**OW mR/hr**" (i.e., beta and gamma) and the nearest landmark.
- 1.2.4 Close the shield, read AND record "**CW mR/hr**" (i.e., gamma) on Form 30.
- 1.2.5 Subtract the CW from the OW readings, multiply the difference by 2, AND record as mrad/hr (i.e., beta).
- 1.2.6 Continue to adjust the function switch to the lowest scale for an on-scale reading.
- 1.2.7 WHEN the Ion Chamber reads less than 0.1 mR/hr use the E-140N, Count Rate Meter.
- 1.2.8 Report the data on Form EP-30 to the Field Team Coordinator.
- 1.2.9 Arrive on location. Record Team arrival on Form EP-10 Report Team arrival to the Field Team Coordinator
- 1.3 Monitor radiation fields on location.
  - 1.3.1 Read **AND** record readings on Form 30 as directed by the ORM.
  - 1.3.2 Use the E-140N Rate Meter. If it reads full scale at "**X1**" AND the RO-2, Ion Chamber reads more than 0.1 mR/hr, THEN use the Ion Chamber.
  - 1.3.3 Use Form EP-30, Monitoring Team Survey Data.
  - 1.3.4 Use the RO-2, Ion Chamber to survey at the location.
  - 1.3.5 Record the "**Team Name:**" "**Team Member Names:**" and "**Date:**" on Form EP-30.
  - 1.3.6 Record the "**Location:**" including the details, on Form EP-30.
  - 1.3.7 Record the Ion Chamber "**Model #:**" and "**Serial #:**" and the "**Time:**" on Form EP-30.

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1.3.8 Leave the vehicle and proceed to an area that is open overhead.

1.3.9 Measure radiation fields at 3 feet and 3 inches above the ground.  
Record the data on Form 30.

**NOTES:**

As a plume of airborne contamination and the chamber approach, both the open window (OW) and closed window (CW) readings increase to reach a peak across the plume at the centerline and a maximum upwind at the release point. (OW vs CW  $\geq 1.5$  indicates inside the plume).

Outside a plume, the OW readings are equal to the CW readings.

Inside a plume, the OW readings are greater than the CW readings.

Ion Chamber @ 3 feet:

- Read **AND** record "(OW) (mR/hr)" Form EP-30
- Read AND record "(CW) (mR/hr)" Form EP-30

**NOTES:**

- Outside a plume, the opened window (OW) and the closed window (CW) readings both increase as surface contamination (the plume footprint) is approached. The OW readings will be greater than CW readings.
- Inside the plume, as surface contamination (the plume footprint) is approached only the OW reading increases, the CW reading does not. The OW reading will be greater than CW readings.
- OW vs CW  $\geq 1.5$  indicates inside the plume.


Ion Chamber @ 3 inches:

- Read AND record "(OW) (mR/hr)" Form EP-30
- Read AND record "(CW) (mR/hr)" Form EP-30

1.3.10 For both the 3" and 3' readings, subtract the CW mR/hr from the OW mR/hr, AND multiply the difference by 2. Record the "(OW-CW) X 2 (mrad/hr)" on Form EP-30.

1.3.11 Return the Ion Chamber to the vehicle

1.3.12 Report the data on Form EP-30 to the Communicator

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Attachment 9.3

**Performing Surface Contamination Checks**

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1.0 When directed by the EOF to perform surface contamination checks, use Form EP-50, Surface Contamination Check, to record information

1.1 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

1.1.1 Enter the "**Date**", the name of the Field Team Member and "**LOCATION**" on Form EP-50

**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.

1.1.2 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".

1.1.3 Record the "**Time**" and the "**SURFACE SMEARED**" on Form EP-50

1.1.4 Annotate a small paper envelope for a smear or a small plastic bag for a gauze wipe with this information from Form EP-50:

1.1.4.1 "Date"

1.1.4.2 "LOCATION"

1.1.4.3 "Time"

1.1.4.4 "SURFACE SMEARED"

1.1.5 Place the smear or wipe in the paper envelope or plastic bag.

1.1.6 Proceed to the ALARA location to count the samples.



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**Performing Surface Contamination Checks**

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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.

1.2 Measure the surface contamination samples.

1.2.1 Use the following:

1.2.1.1 E-140N or RM-14 Count Rate Meter, with HP-210 pancake probe

1.2.1.2 Surgeon's rubber gloves

1.2.1.3 Tweezers

1.2.1.4 Planchets

1.2.1.5 Smear or wipe in a small paper envelope or plastic bag

1.2.1.6 Form EP-50 used to record surface contamination sampling data.

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

1.2.2.1 Using either the E140N or RM-14 measure background for the smear or wipe, "**BKGD CPM**".

1.2.2.1.1 Place the probe about one quarter inch above an empty planchet using the SHA4 holder.


1.2.2.1.2 Adjust the function switch to the lowest multiplier without exceeding full scale on the meter.

1.2.2.1.3 Read **AND** record the "**BKGD CPM**" on Form 50.

1.2.2.2 Measure the smear or wipe, "**SMEAR + BKGD CPM**".

1.2.2.2.1 Remove, using tweezers, a smear or wipe from the envelope or plastic bag. Place the smear or wipe on the planchet.

1.2.2.2.2 Place the probe about one quarter to one half inch above the smear or wipe.

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## Performing Surface Contamination Checks

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- 1.2.2.2.3 Adjust the function switch to the lowest multiplier without exceeding full scale on the meter.
- 1.2.2.2.4 Read AND record "**SMEAR + BKGD CPM**" on Form 50.
- 1.2.2.3 Calculate AND record "**SMEAR CPM**". Subtract "**BKGD CPM**" from "**SMEAR + BKGD CPM**".
- 1.2.2.4 Return, using tweezers, the smear or wipe with the planchet to its small paper envelope or plastic bag
- 1.2.3 Remove the rubber gloves and place them in the bag designated for radiological trash. .
- 1.2.4 Repeat steps from 1.2 for additional smears or wipes.
- 1.2.5 Report the data on Form EP-50 to the Field Team Coordinator.







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<u>Sector- Mile</u>	<u>Map Number (Grid)</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.
1-7	P-3 (B-9)	Route 9D North @ 3.3-3.4 mi. north of Bear Mt. Bridge. [l] (St. Francis Friary)	(See 1-2), Bear Mt. Bridge Rd. West to Bear Mt. Bridge. <b>Right</b> to Rte. 9D North.
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.
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.
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.
2-6	W-1 (D-2) also P-3 (D-10)	Rte. 13 (Sprout Brook Rd.) @ [l] 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.).
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.
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.



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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.
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.
3-10	P-6 (F-8)	Rte. 21, Peekskill Hollow Rd. @ [l] Tinker Hill Rd.	(See 3-6), <b>Right</b> to Rte. 21, Peekskill Hollow Rd.
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.
4-3	W-2 (D-6)	Maple Ave. @ [l] 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.
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.
4-10	W-11 (J-3)	Somerston Rd. @ [l] 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.
5-2	W-2 (C-7)	McKinley St. @ [l] (former McKinley School).	Rte. 9A North. <b>Right</b> to Welcher Ave. <b>Left</b> on McKinley St.
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.
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.
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.



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6-1	W-2 (C-7)	Rte. 9A @ Tate Ave. Westchester Industrial Park	Rte. 9A South to Tate Ave.
6-3	W-2 (D-8)	Watch Hill Rd. @ [l] Mountainside Tr.	Rte. 9A South. <b>Left</b> on Watch Hill Rd.
6-7	W-12 (F-9)	Rte. 129 North @ Hunter Brook Bridge	(See 5-10), Rte. 129, Maple St. North.
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.
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.
7-4	W-2 (D-9)	Watch Hill Rd. @ [l] Westminster Dr.	(See 5-4), <b>Right</b> to Watch Hill Rd.
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.
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.
8-1	W-2 (B-7)	Westchester Ave. @ (Buchanan Verplank Elementary School)	(See 7-1), Westchester Ave. past 1 <sup>st</sup> St., between 4 <sup>th</sup> St. and Pheasant Run.
8-3	W-3 (C-9)	Crugers Station Rd. @ [r] Ripley Pl.	Rte. 9A South. <b>Right</b> to Crugers Station Rd.
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.
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.
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.
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.



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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.
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.
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.
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.
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.
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.
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.
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.
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.
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.



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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.)
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.
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).
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).
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.)
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.
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.
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.
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.



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<u>Sector- Mile</u>	<u>Map Number (Grid)</u>	<u>Location</u>	<u>Directions (off major roads from site)</u>
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.
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.
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.
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.
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.
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).
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.
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.
16-9	O-18 (BB-11)	Rte. 9W @ Rte. 293	(See 16-4), Bear Mt. Bridge West to Rte. 9W North to Rte. 293.

Key for County Maps


W- Westchester County Map, © 2001

P- Putnam County Map, © 2001

R- Rockland County Map, © 2000

O- Orange County Map, © 2000

Map Number and Coordinates based on Hagstrom County Atlases.

 <b>IPEC SITE EMERGENCY PLAN IMPLEMENTING PROCEDURE</b>	<b>NON-QUALITY RELATED PROCEDURE</b>	<b>IP-EP-320</b>	<b>Revision 4</b>
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## Attachment 9.6

### 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.
- ❑ Field 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, Field Team Members report to the Offsite Radiological Manager (ORM) 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 Field 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. Field Monitoring Teams monitor outside this boundary.
- ❑ Emergency Sampling Point locations are listed in Attachment 9.5 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 TLDs and air sampling station filters at fixed sites within the 10 Mile EPZ, submit the TLDs and filters for analysis, sample soil and water and perform other activities prescribed in the station NEM Procedures.

 <b>IPEC SITE EMERGENCY PLAN IMPLEMENTING PROCEDURE</b>	<b>NON-QUALITY RELATED PROCEDURE</b>		<b>IP-EP-320</b>	<b>Revision 4</b>
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Attachment 9.6


## **Radiological Field Monitoring Discussion**

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### **EQUIPMENT AND MATERIALS**

- ❑ Equipment and material for the Field Teams are at the EOF in a closet behind the south wall in the east stairwell near the foot of the stairs.
- ❑ A key for the closet 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 monitoring kits. Each kit has two sealed cases, A and B.
- ❑ Three vehicles, with mobile radio for the IPEC Radio Service and cellular phone, are available for the Field Teams. The keys are inside the closet in the stairwell. These vehicles are either at the Buchanan Service Center (EOF parking lot), on-call by Radio or cellular phone.
- ❑ Vehicles are equipped with 12 VDC/125 VAC inverters.
- ❑ Additional equipment is also available in the EOF storage closet:
  1. Potassium Iodide (KI)
  2. Batteries, "D" size
- ❑ Field 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.



	<b>IPEC SITE EMERGENCY PLAN IMPLEMENTING PROCEDURE</b>	<b>NON-QUALITY RELATED PROCEDURE</b>	<b>IP-EP-320      Revision 4</b>
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**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.



Attachment 9.7  
**Reuter Stokes Locations**  
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Monitor Number	Location	County
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, Verplank	Westchester
10	11 <sup>th</sup> . Street & Highland Avenue, Verplank	Westchester
11	End of 9 <sup>th</sup> . Street/ West side of Quarry, Verplank	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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Attachment 9.8  
GPS Monitoring Locations  
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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



Attachment 9.8  
**GPS Monitoring Locations**  
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<u>Longitude</u>	<u>Latitude</u>	<u>GPS Location Designation</u>	<u>Location</u>
-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



Attachment 9.8  
GPS Monitoring Locations  
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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
-73.88757	41.19711	S8-M6, E	Half Moon Bay Drive
-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
-73.89637	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
-73.05553	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
-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 9.8  
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/Norht Liberty Drive/US-202
-73.97286	41.29348	S15-M2	US-9W/Norht 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

[illegible]





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**Attachment 9.9  
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 Hud.
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