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United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400/LICENSE NO. NPF-63
CHANGE TO EMERGENCY PLAN IMPLEMENTING PROCEDURE

Dear Sir or Madam:

In accordance with 10 CFR 50, Appendix E, Carolina Power & Light Company is transmitting one copy of a recently revised Harris Nuclear Plant Emergency Plan implementing procedure. The enclosure to this letter identifies the emergency plan implementing procedure revised and the effective date.

Questions regarding this submittal may be referred to Mr. E. A. McCartney at (919) 362-2661

Sincerely,

RJ Field

R. J. Field
Manager, Regulatory Affairs
Harris Nuclear Plant

MGW

Enclosures

c: Mr. J. B. Brady (NRC Senior Resident Inspector, HNP)
Mr. Rich Laufer (NRR Project Manager, HNP)
Mr. L. A. Reyes (NRC Regional Administrator, Region II) with two copies of procedure

Harris Nuclear Plant
5413 Shearon Harris Road
New Hill, NC 27562

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CHANGE TO EMERGENCY PLAN IMPLEMENTING PROCEDURE

PROCEDURE NUMBER	TITLE	EFFECTIVE DATE
PEP-330, Revision 5	Radiological Consequences	05/03/2001

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Information Use

CAROLINA POWER & LIGHT COMPANY

SHEARON HARRIS NUCLEAR POWER PLANT

PLANT OPERATING MANUAL

VOLUME 2

PART 5

PROCEDURE TYPE: Plant Emergency Procedure

NUMBER: PEP-330

TITLE: Radiological Consequences

Table of Contents

1.0 PURPOSE

The purpose of this procedure is specify the methods to be used for conducting emergency plant monitoring, radiological controls for emergency workers, dosimetry for Immediate Response Organization (IRO) Personnel, the administration of potassium iodide and environmental monitoring.

2.0 INITIATING CONDITIONS

An emergency has been declared and airborne radiological or hazardous chemical surveys or plant samples are required.

3.0 PROCEDURE STEPS

3.1 Emergency Plant Monitoring

Monitoring of radiation during an emergency shall be performed using existing plant procedures, where practical. The exposure guidelines, as stated in Attachment 1, shall be followed.

3.2 Radiological Controls for Emergency Workers

Radiation Control (RC) Team personnel shall:

1. Write necessary Emergency Radiation Work Permits (ERWP) using guidance provided in HPP-600 or Attachments 10 and 11.

2. Issue needed equipment specified on the ERWP.

3. Document issuance of dosimetry and respirators. Documentation may be deferred until after the task is complete.

4. Assist individuals in donning protective clothing and respirators.

5. Accompany teams to provide continuous radiological coverage as specified on the ERWP.

6. Assist emergency workers in removing protective equipment and monitoring for contamination, when the task is complete.

7. Record exposures from dosimetry on the ERWP or via RIMS sign out process. This information may be verbally transmitted to the RCC who shall have the information transcribed onto the ERWP.

8. Ensure that any deferred documentation is completed.

3.3 Dosimetry for Immediate Response Organization (IRO) Personnel

1. Security Team personnel shall issue a dosimetry packet to each individual arriving on-site. No documentation need be completed at the time of issue.

2. IRO personnel exposures shall be controlled by the accompanying RC Team members.

NOTE: IRO personnel leaving site with a contaminated injured individual may keep their dosimetry until it is collected and recorded by an accompanying RC Team member.

3. When IRO personnel are ready to leave the site, an RC Team member shall collect their dosimetry and record the name, social security number, TLD and SRPD serial numbers, and the reading on the SRPD for each individual on Attachment 12.

4. RC Team personnel shall process the dosimetry of IRO personnel.

5. The RC Team shall inform the Radiological Control Coordinator (RCC) of exposure information for IRO personnel when it is available.

3.4 Radiological Habitability Controls For the Emergency Response Facilities

1. Perform habitability surveys in each facility (TSC, OSC, Control Room, and EOF) after activation and at appropriate intervals thereafter.

2. Resurvey the facility if there is a potential for an airborne radiological release or a release has occurred. Follow up should be performed as needed.

3. Ensure the habitability status is posted in the facility.

4. Ensure that personnel are aware of restrictions as a result of habitability surveys in their facility.

3.5 Administration of Potassium Iodide (KI)

1. Guidance for Controlling Doses to Emergency Workers

   a. Dose to workers during an emergency should be limited to 5 rem.

   b. Workers participating in activities in which dose will exceed 25 rem to the whole body should do so on a voluntary basis and be aware of the risks. (See Attachment 1)

   c. Workers performing services during an emergency should be limited to 50 rem to the thyroid.

   d. KI should be considered as a potential dose reducing option for any situation in which airborne radioactive iodine is present (an additional ALARA option).

2. Dose Determination

   a. KI should be administered to emergency workers to maintain dose to the thyroid below 50 rem.

      (1) KI is 90% effective in blocking the uptake of radioiodine by the thyroid if administered within the first hour, and is 50% effective if administered within four (4) hours.

      (2) Almost no benefit will be obtained if KI is administered 10-14 hours after exposure.

   b. The isotopic halogen concentrations must be determined before a thyroid dose can be estimated. Concentrations can be determined by direct measurement of each isotope or by estimations based on a known I-131 concentration (See Attachment 5)

   c. When estimated concentrations are used, the estimations should be confirmed by direct measurement as soon as practical.

   d. Thyroid dose, in mrem, can be determined from isotopic concentrations (in μCi/cc) using Attachment 15.

3. Issuing KI

NOTE: The Radiological Control Director or Radiological Control Manager is responsible for coordinating the administration of KI to HNP emergency workers.

   a. Notify those who are to receive KI to report to a designated location for distribution.

3.5 Administration of Potassium Iodide (KI) (continued)

b. Ask each individual if they have ever had an allergic reaction to iodide (advise them that most table salt and shellfish contain iodide).

c. Advise personnel that the use of KI is voluntary and to read the packet insert (an example is provided as Attachment 13).

CAUTION

Individuals who have known allergies to iodide shall NOT be issued KI.

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d. Issue one 130 mg KI tablet to each individual who is to receive KI.

e. Instruct each individual to report back the next day (continue issuing one 130 mg KI tablet to each individual daily for 10 days or as directed by medical personnel).

f. Ensure approval and documentation is logged including the following:

(1) Lot number and expiration date (if available) of the KI administered.

(2) Name and badge number of each individual the KI was given.

(3) Name of any individual declining to take the KI and the reason for not taking the drug.

4. Follow up Actions

a. Evaluate if an individual was actually exposed to elevated concentrations of airborne radioiodine where a dose commitment to the thyroid of 25 rem Committed Dose Equivalent (CDE) could have been exceeded.

b. Contact medical personnel and request follow-up care and further instruction for personnel who have been issued KI using the following guidance as appropriate:

(1) Perform a whole body count and a thyroid count for each individual exposed (if possible) before the additional KI tablet is administered.

(2) If the whole body burden of I-131, decay corrected to the time of exposure, is less than 17 μCi, discontinue administering KI.

3.5 Administration of Potassium Iodide (KI) (continued)

(3) If a whole body count cannot be performed, or if the whole body burden, less the thyroid burden decay corrected to the time of exposure, exceeds 17 μCi, administer an additional dosage of KI.

(4) If actual exposure to an individual is not suspected, do not administer any additional KI.

3.6 Environmental Monitoring

The Environmental Monitoring Team Startup Checklist is Attachment 16.

1. Team Exposure Controls

a. Teams should notify Control prior to entering areas with exposure rates greater than 50 mrem/hr or exceeding individual exposure of 300 mrem TEDE.

b. Teams shall receive permission from the Emergency Response Manager through Control prior to entering areas with exposure rates greater than 25 rem/hr or exceeding individual exposure of 5 rem TEDE.

2. Operation of Air Sampling Equipment

a. Place sampler in an appropriate location.

b. Start the gasoline generator (if applicable) nearby or use the outlet located on the siren poles.

c. Ensure the line switch is off and plug sampler into the power outlet on the generator or at the siren pole. Exercise caution if water or other liquids are on the floor or ground.

d. Obtain an iodine air sample as follows:

(1) Install a filter paper and iodine cartridge (activated charcoal unless directed otherwise) in the filter housing.

(2) Place the switch at VARIABLE position.

(3) Adjust flow control knob to obtain approximately 2 CFM flow rate. Do not exceed 3 CFM.

(4) Record the start time on Attachment 3.

3.6 Environmental Monitoring (continued)

(5) When the desired volume has been sampled, place the switch in OFF. Typically, the sampler is run for 10 minutes at 2 CFM to obtain a 20 ft^3 volume.

(6) Record the stop time.

(7) Remove the filter and cartridge with forceps or gloves and place them in separate plastic bags. Complete air sample label and place on bags. Leave the iodine cartridge bag open to allow the cartridge to off-gas.

e. Save the filter and/or cartridge for field estimation of I-131 activity or for isotopic analysis.

3. Field Estimate of Airborne I-131 Activity

a. Obtain the iodine collection cartridge and carry it to an area of relatively low background.

b. Record the background level on Attachment 3.

NOTE: The measurements should be made through the plastic bag.

c. Ensure that at least five minutes have elapsed after removing the cartridge from sampler and place the HP-210 type GM tube probe against one flat surface of the cartridge and record the observed measurement on Attachment 3.

d. Place the survey probe against the opposite side of the cartridge and record the measurement.

e. Calculate the net measurement of each flat surface and select the higher value. Immediately report any off-scale readings to Control.

f. Determine the I-131 μCi per cc of air sampled for the net CPM of the cartridge using Attachment 5.

g. Record this value on Attachment 3 and sample label.

h. Report the results to Control.

i. Save the sample for laboratory analysis. All small samples may be placed in a larger bag.

3.6 Environmental Monitoring (continued)

4. Measurement of Ambient Radiation Readings

a. Using the radiation measurement instrument per direction of Control, take radiation intensity measurements at about 6 inches above ground and at about 1 meter (waist high). Survey the area to ensure that the measurement is indicative of general location and not affected by local hot spots.

b. Record the results on Attachment 3.

c. Report all significant measurements to Control.

5. Measurement of Integrated Exposure by TLDs

NOTE: The TLDs in the field are for routine radiological environmental monitoring and should not be removed by EMTs. This section addresses the placement of emergency environmental TLDs as directed by Control.

a. Go to the location directed by Control. Fasten new TLD packets to tree, power pole, or other specified location. The location must be conspicuous.

b. Place TLD in a plastic bag or equivalent to prevent moisture accumulation in the crystal.

c. Provide a description of the area and log information on Attachment 14, and/or mark the location where the TLD is placed so that it may be easily located by other EMT members.

6. Labeling Environmental Samples

a. Each environmental team will be given a team number upon deployment. The first two digits of the sample control number will be the team number.

b. Place the team number, sample type from Attachment 6, and sample number, in sequence, on the sample label as illustrated on Attachment 4.

c. Specify the sample type. For example, if the sample is food crop, state is it is turnips, collards, or potatoes, or so forth.

d. Write down map location as accurately as possible. Specify whether sample was taken by the road, in a pasture, and so forth.

e. Measure sample radioactivity levels (mrem/hr) with a survey instrument and record the reading on the label.

3.6 Environmental Monitoring (continued)

f. Place radioactive material stickers, labels, tape, or equivalent on samples that are greater than the background dose rates.

g. Write initials, date, and time on the label.

h. Place the label on sample container.

i. Log samples on Attachment 3.

7. Collection of Environmental Samples

NOTE: The Off-site Dose Calculation Manual (ODCM) may be referred to for routine environmental monitoring locations.

a. Soil Sampling (sediment and surface soil)

(1) Clear vegetation, rocks, litter, and other non-soil items from a 1 square foot area and mark out the area. A plastic bag in the sampling kit has a template with an area of 1 square foot.

(2) Remove soil from the marked area to a depth of about 1 inch and place in a container.

(3) Do not seal the container until the sample is delivered to sample control point specified by Control.

(4) Label the sample.

b. Ground Water Supplies

(1) Flush all sample lines and rinse sample container.

(2) Collect at least a gallon of sample and replace cap securely.

(3) Label the sample.

c. Surface Water, Snow, or Ice

NOTE: Surface water samples from cooling tower intake and discharge structures may be collected from the composite samplers or by grab sampling described below.

(1) Collect a gallon surface water sample from a boat, highway bridge, canal structure or shore.

(2) Collect the equivalent of 500 ml liquid of snow or ice samples, for analysis. This might require collection in 4 liter containers.

(3) Label the samples.

3.6 Environmental Monitoring (continued)

d. Rainwater

(1) Collect rainwater by cutting top off a cubitainer or other suitable container and placing it in a clearing away from trees or buildings.

(2) Label the sample and record the approximate collection area of the container on the label so that an estimate of μCi/cc/sq. cm can be made.

e. Vegetation and Crops

(1) Collect approximately 3 pounds of leafy vegetation from exposed areas, since deposition is unlikely under trees. Larger leafy vegetation is preferable. Avoid pine needles.

(2) Collect samples of pasture grass each time milk is sampled. Clip grass close to roots without including dirt in the sample. Note the approximate size of the area from which the sample was taken (ft^2 or m^2).

(3) Collect approximately 3 pounds of aquatic vegetation from exposed areas (areas not covered by tree limbs or overhangs).

(4) Close sample containers.

(5) Label the samples.

f. Milk

(1) Milk sampling should begin the day after an atmospheric release and every two days thereafter until I-131 levels return to normal.

(2) Collect at least 1 gallon sample either from bulk tanks after thorough mixing or from a single cow.

g. Shellfish and Fin Fish

(1) Collect the equivalent of 500-1000 grams (1-2 pounds) of shellfish or fin fish for analysis.

(2) Close sample containers.

(3) Label the sample.

3.6 Environmental Monitoring (continued)

8. Sample Transport

NOTE: Environmental samples > 1 mrem/hr will not be delivered to the HEEC for analysis.

a. Sample delivery by the teams

(1) Inform Environmental Field Coordinator of the estimated time of arrival (ETA) to the Vehicle Monitoring-Contamination Control location (Division of Radiation Protection's (DRP) Mobile Laboratory.

(2) Ensure the samples delivered to the Mobile Lab are labeled correctly and loose surface contamination is either removed or sample is placed in another "clean" bag/container.

(3) Upon arrival at the Vehicle Monitoring-Contamination Control location, deliver the samples to the Sample Control person and await instructions from the Vehicle Monitoring-Contamination Control Leader.

(4) Contact the Environmental Field Coordinator and await further instructions.

b. Sample delivery by the courier

(1) Inform Environmental Field Coordinator of the estimated time of arrival (ETA) to the agreed upon location.

(2) Ensure the samples delivered to the courier are labeled correctly and loose surface contamination is either removed or sample is placed in another "clean" bag/container.

(3) Upon arrival at the agreed upon location deliver the samples to the courier per his/her instructions and continually verify the area as low dose/contamination.

(4) Contact the Environmental Field Coordinator and await further instructions.

c. Sample delivery to the HEEC

(1) Inform Environmental Field Coordinator of the estimated time of arrival (ETA) to the HEEC.

(2) Ensure the samples delivered to the HEEC are labeled correctly and loose surface contamination is either removed or sample is placed in another "clean" bag/container.

3.6 Environmental Monitoring (continued)

(3) Upon arrival at the HEEC deliver the samples to the Sample Control person briefing the laboratory personnel on the radiological conditions of the samples.

(4) Contact the Environmental Field Coordinator and await further instructions.

9. Termination of EMT Activities

a. Ensure containers are securely sealed.

b. Ensure proper labels are on samples with accurate map locations.

c. Return to HE&EC and return vehicle keys, TLDs, the environmental kits, and the radios, when directed by Control.

d. Perform appropriate inventories.

e. Forward all Environmental Monitoring Data Logs to the Environmental Field Coordinator in the EOF.

4.0 GENERAL

1. The release of radioiodines is postulated for nearly every accident scenario that involves significant off-site exposures. These radioiodines pose a threat to the thyroid gland and will require protective action to minimize the thyroid exposure.

2. Stable iodine is a useful agent to block the uptake of radioiodine by the thyroid gland. Blocking occurs when the thyroid gland is saturated with stable iodine, thus preventing the uptake of radioactive iodine species. KI has been approved by the Food and Drug Administration for this use.

3. The risk of detrimental side effects from the short term use of KI for thyroid blocking in a radioactive emergency have been determined by the U. S. Food and Drug Administration to be outweighed by the risks of radioiodine induced thyroid nodules or cancer at a projected dose to the thyroid gland of 25 rem CDE or greater.

5.0 REFERENCES

1. PLP-201, Section 4.4, "Assessment Actions"

2. PLP-201, Section 4.6, "Protective Actions for On-Site Personnel"

3. HPP-600, “Preparation of Radiation Work Permits”

6.0 DIAGRAMS/ATTACHMENTS

See Table of Contents

Limitations for Lifesaving and Emergency Reentry/Repair Actions

1. A Declared Pregnant Woman shall not take part in these actions.

2. Internal exposure should be minimized by the use of the most appropriate respiratory protection or ALARA practice whenever possible, and contamination should be controlled by the use of protective clothing when practical.

3. Emergency worker exposures during lifesaving and repair/reentry efforts should be limited to the following:

DOSE LIMIT (rem TEDE)	ACTIVITY	CONDITION
5	All	All
10	Protecting valuable property	Lower dose not practicable
25	Lifesaving or protection of large populations	Lower dose not practicable
>25	Lifesaving or protection of large populations	Only on a voluntary basis to persons fully aware of the risks involved

4. Limit dose to the lens of the eye to three (3) times the above values and doses to any other organ (including thyroid, skin and body extremities) to ten (10) times the above values.

5. Entry into radiation fields of greater than 25 rem/hr or exposure in excess of 5 rem TEDE shall not be permitted unless specifically authorized by the Site Emergency Coordinator.

6. In emergency situations where a exposure in excess of 25 rem TEDE would be required, the following additional criteria shall be considered:

   a. Rescue personnel must be volunteers.

   b. Rescue personnel should have a full awareness of the risks involved (See Attachment 2).

   c. Other things being equal, volunteers above the age of 45 should be selected whenever possible for the purpose of avoiding unnecessary genetic effects.

   d. Exposure under these conditions should be limited to once in a lifetime, and shall be included when calculating future lifetime permissible exposures.

Potential Health Effects of Exposure to Ionizing Radiation
Health Effects Associated with Whole-Body Absorbed Doses Received Within a Few Hours[a]

Whole Body Absorbed Dose (rad)	Early Fatalities[b] (%)	Whole Body Absorbed Dose (rad)	Prodromal Effects[c] (% affected)
140	5	50	2
200	15	100	15
300	50	150	50
400	85	200	85
460	95	250	98

[a] Risks will be lower for protracted periods.

[b] Supportive medical treatment may increase the dose at which these frequencies occur by approximately 50 percent.

[c] Forewarning symptoms of more serious health effects associated with large doses of ionizing radiation.

Approximate Cancer Risk to Average Individuals from 25 Rem Effective Dose Equivalent Delivered Promptly

Age at Exposure (years)	Approximate Risk of Premature Death (deaths/1000 people exposed)	Average Years of Life Lost if Premature Death Occurs (years)
20 to 30	9.1	24
30 to 40	7.2	19
40 to 50	5.3	15
50 to 60	3.5	11

Potential Health Effects of Exposure to Ionizing Radiation
Radiation Doses Causing Acute Injury to Organs

NOTE: All doses shown are total effective dose equivalent in rem.

Organ	Volume or Area of Exposure	Risk of injury in five years		Type of Injury
		5 percent	50 percent	
Bone marrow	whole	230	340	aplasia and pancytopenia
	segment	1135	1360	
Liver	whole	1000	1360	acute and chronic hepatitis
Stomach	100 cm^2	1464	1665	ulcer, perforation, hemorrhage
Intestine	400 cm^2	1465	1665	ulcer, perforation, hemorrhage
	100 cm^2	1570	1855	
Lung	whole	720	1000	acute and chronic pneumonitis
	100 cm^2	1135	1245	
	75 percent	770	-------	
Kidney	whole	875	1000	acute and chronic ephrosclerosis
Brain	whole	1770	1950	infarction, necrosis
Spinal cord	10 cm	1465	1665	infarction, necrosis
Heart	60 percent	1465	1665	pericarditis and pancarditis
Skin	---	1665	1950	ulcers, fibrosis
Fetus	whole	200	314	death
Lens of eye	whole	355	620	cataracts
Ovary	whole	200-430	410-875	permanent sterilization
Testes	Whole	340-720	410-875	permanent sterilization

ENVIRONMENTAL MONITORING DATA LOG

Date _____ Log Page _____ of _____

Field Team Data

Team ID _____ Team Members _____
Air Sampler S/N _____ Flow Rate _____
Survey Instrument Type _____ S/N _____ Response Check ❑
Survey Instrument Type _____ S/N _____ Response Check ❑
Survey Instrument Type _____ S/N _____ Response Check ❑

Ambient Radiation Levels

Instrument Used _____ Readings: 6 inches / 1 meter

Time _____ Location _____
Time _____ Location _____
Time _____ Location _____
Time _____ Location _____
Time _____ Location _____
Time _____ Location _____
Time _____ Location _____
Time _____ Location _____

Air Filter/Cartridge Field Measurements

	Location	Location	Location
Time			
Coordinates (degrees\miles)			
Run Time min			
Sample Volume in ft^3 (ft^3 = CFM x number of minutes)			
Filter Dose Rate mrem/hr			
Filter Sample ID			
Cartridge sample ID			
Cartridge Side 1 cpm			
Cartridge Side 2 cpm			
Background cpm			
Net Counts Per Minute			
I-131 Estimate µCi/cc			
Cartridge Dose Rate mrem/hr			

Form PEP-330-3-1

ENVIRONMENTAL MONITORING DATA LOG

Environmental Samples

Sample ID	Time	Type	Vol/Wt/Area	mrem/hr	Location

Personnel Dosimeter Reading

Time	Team Member	Initial Reading mrem	Final Reading mrem

Form PEP-330-3-1

SAMPLE LABELS

ENVIRONMENTAL SAMPLE LABEL (Example)

SAMPLE CONTROL NUMBER 02FC03
SAMPLE TYPE Food Crop - Turnip Greens
LOCATION James Rest Home
TAKEN BY John Doe DATE/TIME 4/1/90/1430
ACTIVITY UPON
COLLECTION less than 0.05 mrem/HR
COMMENTS _____
_____
_____

AIR SAMPLE LABEL

SAMPLE CONTROL NUMBER
AIR SAMPLER _____ TAKEN BY _____
LOCATION _____
_____
SAMPLE ON (DATE/TIME/INITIAL) / /
SAMPLE OFF (DATE/TIME/INITIAL) / /
TOTAL SAMPLE TIME (MIN.) _____
FLOW (ft^3/min.) _____
VOLUME (ft^3) _____
INITIAL ACTIVITY _____ mrem/hr
I-131 ACTIVITY ESTIMATE _____ µCi/cc
COMMENTS _____
_____
_____

ESTIMATED IODINE-131 μCi/cc

	TOTAL FLOW (CUBIC FEET)										
NET CPM	10	12	15	20	25	30	40	50	60	70	80
100	9.2E-08	7.7E-08	6.2E-08	4.6E-08	3.7E-08	3.1E-08	2.3E-08	1.8E-08	1.5E-08	1.3E-08	1.2E-08
200	1.8E-07	1.5E-07	1.2E-07	9.2E-08	7.4E-08	6.2E-08	4.6E-08	3.7E-08	3.1E-08	2.6E-08	2.3E-08
300	2.8E-07	2.3E-07	1.8E-07	1.4E-07	1.1E-07	9.2E-08	6.9E-08	5.5E-08	4.6E-08	4.0E-08	3.5E-08
400	3.7E-07	3.1E-07	2.5E-07	1.8E-07	1.5E-07	1.2E-07	9.2E-08	7.4E-08	6.2E-08	5.3E-08	4.6E-08
500	4.6E-07	3.9E-07	3.1E-07	2.3E-07	1.8E-07	1.5E-07	1.2E-07	9.2E-08	7.7E-08	6.6E-08	5.8E-08
600	5.5E-07	4.6E-07	3.7E-07	2.8E-07	2.2E-07	1.8E-07	1.4E-07	1.1E-07	9.2E-08	7.9E-08	6.9E-08
700	6.5E-07	5.4E-07	4.3E-07	3.2E-07	2.6E-07	2.2E-07	1.6E-07	1.3E-07	1.1E-07	9.2E-08	8.1E-08
800	7.4E-07	6.2E-07	4.9E-07	3.7E-07	3.0E-07	2.5E-07	1.8E-07	1.5E-07	1.2E-07	1.1E-07	9.2E-08
900	8.3E-07	6.9E-07	5.5E-07	4.2E-07	3.3E-07	2.8E-07	2.1E-07	1.7E-07	1.4E-07	1.2E-07	1.0e-07
1000	9.2E-07	7.7E-07	6.2E-07	4.6E-07	3.7E-07	3.1E-07	2.3E-07	1.8E-07	1.5E-07	1.3E-07	1.2e-07
1500	1.4E-06	1.2E-06	9.2E-07	6.9E-07	5.5E-07	4.6E-07	3.5E-07	2.8E-07	2.3E-07	2.0E-07	1.7E-07
2000	1.8E-06	1.5E-06	1.2E-06	9.2E-07	7.4E-07	6.2E-07	4.6E-07	3.7E-07	3.1E-07	2.6E-07	2.3E-07
2500	2.3E-06	1.9E-06	1.5E-06	1.2E-06	9.2E-07	7.7E-07	5.8E-07	4.6E-07	3.9E-07	3.3E-07	2.9E-07
3000	2.8E-06	2.3E-06	1.8E-06	1.4E-06	1.1E-06	9.2E-07	6.9E-07	5.5E-07	4.6E-07	4.0E-07	3.5E-07
3500	3.2E-06	2.7E-06	2.2E-06	1.6E-06	1.3E-06	1.1E-06	8.1E-07	6.5E-07	5.4E-07	4.6E-07	4.0E-07
4000	3.7E-06	3.1E-06	2.5E-06	1.8E-06	1.5E-06	1.2E-06	9.2E-07	7.4E-07	6.2E-07	5.3E-07	4.6E-07
5000	4.6E-06	3.9E-06	3.1E-06	2.3E-06	1.8E-06	1.5E-06	1.2E-06	9.2E-07	7.7E-07	6.6E-07	5.8E-07
6000	5.5E-06	4.6E-06	3.7E-06	2.8E-06	2.2E-06	1.8E-06	1.4E-06	1.1E-06	9.2E-07	7.9E-07	6.9E-07
7000	6.5E-06	5.4E-06	4.3E-06	3.2E-06	2.6E-06	2.2E-06	1.6E-06	1.3E-06	1.1E-06	9.2E-07	8.1E-07
8000	7.4E-06	6.2E-06	4.9E-06	3.7E-06	3.0E-06	2.5E-06	1.8E-06	1.5E-06	1.2E-06	1.1E-06	9.2E-07
9000	8.3E-06	6.9E-06	5.5E-06	4.2E-06	3.3E-06	2.8E-06	2.1E-06	1.7E-06	1.4E-06	1.2E-06	1.0E-06
10000	9.2E-06	7.7E-06	6.2E-06	4.6E-06	3.7E-06	3.1E-06	2.3E-06	1.8E-06	1.5E-06	1.3E-06	1.2E-06
15000	1.4E-05	1.2E-05	9.2E-06	6.9E-06	5.5E-06	4.6E-06	3.5E-06	2.8E-06	2.3E-06	2.0E-06	1.7E-06
20000	1.8E-05	1.5E-05	1.2E-05	9.2E-06	7.4E-06	6.2E-06	4.6E-06	3.7E-06	3.1E-06	2.6E-06	2.3E-06
25000	2.3E-05	1.9E-05	1.5E-05	1.2E-05	9.2E-06	7.7E-06	5.8E-06	4.6E-06	3.9E-06	3.3E-06	2.9E-06
30000	2.8E-05	2.3E-05	1.8E-05	1.4E-05	1.1E-05	9.2E-06	6.9E-06	5.5E-06	4.6E-06	4.0E-06	3.5E-06
35000	3.2E-05	2.7E-05	2.2E-05	1.6E-05	1.3E-05	1.1E-05	8.1E-06	6.5E-06	5.4E-06	4.6E-06	4.0E-06
40000	3.7E-05	3.1E-05	2.5E-05	1.8E-05	1.5E-05	1.2E-05	9.2E-06	7.4E-06	6.2E-06	5.3E-06	4.6E-06
50000	4.6E-05	3.9E-05	3.1E-05	2.3E-05	1.8E-05	1.5E-05	1.2E-05	9.2E-06	7.7E-06	6.6E-06	5.8E-06

Estimated activity of Iodine-131 in air versus observed net count rate (using HP-210 probe, or equivalent, in contact with a plastic bag 0.004 inch (4 mil) thick containing an iodine collection cartridge). The average efficiency is 0.00172

ENVIRONMENTAL SAMPLE TYPES

Sample Types

AC	Air Cartridge
AP	Air Particulate
AV	Aquatic Vegetation
FC	Food Crops
GW	Groundwater
IC	Ice
MK	Milk
OT	Other
RA	Rain Water
SD	Sediment (shoreline)
SS	Surface Soil
SN	Snow
SW	Surface Water
TV	Terrestrial Vegetation
SF	Shellfish
FF	Fin fish

Potential Emergency Environmental Monitoring Sites

Code	Coordinates (Deg/miles)	Description
A-1	009/2.6	Near the intersection of SR 1011 and SR 1134 at the Dixie pipeline maintenance point adjacent to the Seaboard Coastline Railroad.
A-2	001/3.2	Approximately 0.8 mile from SR 1011 on SR 1140.
A-3	353/4.3	Approximately 1.7 miles from SR 1141 on SR 1142, 1.4 miles from end of SR 1903, 0.3 mile from Wake County line in Chatham County.
A-4	357/6.2	On SR 1900 approximately 0.2 mile east of the intersection of SR 1900 and SR 1901.
A-5	004/7.4	Intersection of US 64, SR 1001, and 751.
A-6	350/9.0	On SR 1747 by Jordan Lake finger, approximately 1.4 miles from 751.
A-7	359/9.6	Intersection of 751 and SR 1761.
A-8	007/9.6	Intersection of SR 1742 and SR 1743.
A-9	010/9.4	Intersection of SR 1604 and SR 1603.
B-1	023/2.1	Approximately 0.15 mile south of US 1 and SR 1134 and intersection of SR 1189.
B-2	023/3.6	New Hill, North Carolina--intersection of SR 1011, SR 1141, and SR 1127.
B-3	011/4.9	Intersection of SR 1141 and SR 1142 south of railroad track.
B-4	025/5.6	Intersection of SR 1145 and SR 1146 which if off SR 1142 at Mt. Zion Baptist Church.
B-5	016/6.7	Intersection of SR 1160 and SR 1145.
B-6	023/7.2	Intersection of SR 1160 and SR 1162 approximately 1.2 miles east from SR 1145 on SR 1160.
B-7	011/7.7	On US 64 approximately 0.3 mile west of SR 1602 on the west side of an old abandoned railroad track.
B-8	016/8.0	Intersection of US 64 and SR 1601.
B-9	024/8.6	Intersection of US 64 and SR 1163.
B-10	013/9.1	On SR 1603 approximately 1.0 mile northwest from SR 1601. White Oak Creek and old abandoned railroad track.
B-11	030/9.2	Intersection of US 64 and NC 55. On northwest corner from intersection off a one-lane dirt road.

Potential Emergency Environmental Monitoring Sites

Code	Coordinates (Deg/miles)	Description
B-12	023/9.2	Intersection of SR 1601 and SR 1600. Short distance east of intersection.
C-1	033/2.3	Off SR 1127 to end of SR 1182 near James Rest Home (J. C. Garner Station on SR 1127; turn on SR 1182).
C-2	052/2.2	Off SR 1127 at parking lot of the Harris Energy and Environmental Center south of the intersection of SR 1127 and SR 1135.
C-3	047/3.6	On SR 1149 between SR 1151 and SR 1152. Large house on side of SR 1149 with one-lane dirt road.
C-4	044/4.6	Intersection of US 1 and SR 1149 and SR 1154 south of US 1.
C-5	036/5.7	Intersection of SR 1011 and SR 1149.
C-6	034/6.2	Approximately 0.3 mile north of SR 1011 on SR 1187 which connects back to SR 1163.
C-7	046/6.0	At the end of SR 1170 which is dead end. SR 1170 intersects SR 1011.
C-8	040/7.2	Approximately 0.7 mile northeast from intersection of SR 1163 on SR 1011. Approximately 0.6 mile southwest from intersection of SR 1162 on SR 1011. Along Seaboard Coastline Railroad track.
C-9	048/7.4	Intersection of US 1 and SR 1153.
C-10	042/9.0	Intersection of SR 1011 and SR 1037 (West Chatham Street) in the town of Apex.
C-11	049/8.6	Intersection of US 1 and NC 55 at the Ramada Inn parking lot, Apex exit.
D-1	069/4.1	Near the bridge (area of Harris Lake) on SR 1162 approximately 1.3 miles southeast of SR 1149. There is a clear path to Harris Plant on the southeast side of the bridge which is a utility line going to Harris.
D-2	059/6.2	Intersection of SR 1154 and SR 1153.
D-3	069/6.2	Between SR 1152 and intersection of SR 1154 and SR 1153 on SR 1153 approximately 0.5 mile from SR 1152 and approximately 0.3 mile southwest of a small cemetery and approximately 0.7 mile southeast of a bridge over Little Branch.
D-4	064/7.8	Intersection of NC 55 and SR 1301.

Potential Emergency Environmental Monitoring Sites

Code	Coordinates (Deg/miles)	Description
D-5	070/8.9	Intersection of SR 1301 and SR 1302. SR 1302 is approximately 1.48 miles southeast from NC 55 on SR 1301.
D-6	076/9.2	Intersection of SR 1301 and SR 1152.
E-1	084/2.3	Approximately 1.3 miles south of Harris Energy and Environmental Center on SR 1127. Approximately 0.6 mile north of bridge on Harris Lake. Open knoll on east side of road.
E-2	081/7.1	In the town of Holly Springs near the intersection of NC 55 and SR 1152. Site is located in the Wake Recreation Park off Avent Ferry Road and Ballentine Street.
E-3	091/7.5	Southern intersection of NC 55 and SR 1114. Approximately 1.5 miles south of Holly Springs (junction of 55 and SR 1152). NOTE: SR 1114 is a loop which intersects NC 55 twice
E-4	088/8.9	On SR 1393 approximately 2.0 miles from SR 1152. South of Bass lake at Robencliff Housing Development.
E-5	092/9.3	Intersection of SR 1393 and SR 1397.
F-1	114/2.8	Intersections of SR 1127, SR 1130, and SR 1115 (Holleman's Crossroads).
F-2	112/4.2	On SR 1127 approximately 1.3 miles southeast from the intersection of SR 1127 and SR 1115 and approximately 0.8 mile northwest of the intersection of SR 1127 and SR 1116 (pavement ends).
F-3	102/5.5	Intersection of SR 1116 and SR 1125.
F-4	121/5.8	Intersection of SR 1119 and SR 1123. Approximately 0.3 mile south of SR 1123.
F-5	111/7.0	Intersection of SR 1101 and SR 1110.
F-6	118/9.5	In Fuquay-Varina at Action Park which is off NC 55 (Wake Chapel Road) and the intersection of the Norfolk Southern Railway.
G-1	121/2.6	Approximately 0.6 mile southwest of Holleman's Crossroads (intersection of SR 1127 and SR 1130) on SR 1130.
G-2	140/2.3	At the boat landing parking lot on SR 1130 approximately 1.8 miles from the intersection of SR 1130 and SR 1127.

Potential Emergency Environmental Monitoring Sites

Code	Coordinates (Deg/miles)	Description
G-3	138/3.9	At the end (west) of SR 1116 and approximately 0.6 mile west of the intersection of SR 1116 and SR 1117.
G-4	140/5.9	Near the intersection of NC 42 and SR 1403. Approximately 0.4 mile from intersection (Macedonia Baptist Church).
G-5	136/7.0	Intersection of NC 42 and SR 1407 (Duncan Baptist Church).
G-6	124/7.8	Intersection of NC 42 and SR 1101 (Piney Grove Baptist Church).
G-7	131/8.2	Intersection of SR 1412 and SR 1413.
G-8	139/8.0	Intersection of SR 1409 and SR 1417 (Church of God).
G-9	140/8.9	Intersection of SR 1418, SR 1415, SR 1412, and SR 1409.
G-10	127/9.7	On SR 1414 approximately 2.0 miles southeast from NC 42 and SR 1101 which changes to SR 1414 when crossing into Harnett and Wake Counties; approximately 0.5 mile southeast from county lines; Carolina and Northwestern Railway next to SR 1414.
H-1	160/4.5	On SR 1915 approximately 0.8 mile west from the intersection of SR 1402 and SR 1401 in Harnett County. SR 1402 changes to SR 1915 in Chatham County.
H-2	150/4.8	Intersections of SR 1402, SR 1401, and SR 1400 on SR 1401 before intersection of SR 1401 and SR 1402.
H-3	163/5.9	Intersection of NC 42 and SR 1450.
H-4	150/7.1	Intersection of SR 1403 and SR 1407.
H-5	155/7.4	Intersection of SR 1503 and SR 1420. Approximately 0.3 mile from SR 1403 on SR 1420.
H-6	160/8.0	Intersection of SR 1403 and SR 1518 (Cokesbury).
H-7	150/9.0	Intersection of SR 1418 and SR 1427.
H-8	162/8.9	Cumberland Union Baptist Church on SR 1403 approximately 0.8 mile south of intersection SR 1418 and SR 1403.
H-9	147/9.6	Intersection of SR 1412 and SR 1427 at the Baptist Grove Church.
J-1	172/2.7	West end of SR 1130 near Barricade (Wake County line) approximately 0.1 mile from end of the road.

Potential Emergency Environmental Monitoring Sites

Code	Coordinates (Deg/miles)	Description
J-2	175/6.0	Intersection of NC 42 and SR 1917.
J-3	170/8.3	Chalk Level C.M.E. Church approximately 1.6 miles from the intersection of SR 1418 and SR 1403 on SR 1418. Approximately 1.4 miles south of church; SR 1418 changes from pavement to a gravel road.
K-1	203/3.8	Prince's Chapel Church on SR 1912 approximately 0.8 mile north from the intersection of NC 42 and SR 1912.
K-2	194/4.5	Boat ramp on Harris Lake at the end of SR 1914 which intersects SR 1912. (SR 1914 goes east of SR 1912.)
K-3	194/4.5	Intersection of NC 42 and Norfolk Southern Railway and Northwestern Railway. Approximately 0.4 mile north on NC 42 from Buckhorn Creek.
K-4	207/4.9	Buckhorn United Methodist Church on NC 42 near the intersection of NC 42 and SR 1918. Northeast of the community of Corinth.
K-5	210/5.7	Intersection of NC 42 and SR 1916.
K-6	199/5.8	On SR 1921 approximately 1.1 miles from the intersection of NC 42 and SR 1921 southeast of the community of Corinth.
K-7	212/6.9	Intersection of NC 42 and Cape Fear River. Wildlife boat and fishing area.
K-8	198/7.6	Approximately 0.5 mile northeast of SR 1540 which intersects SR 1538.
K-9	213/7.8	Intersection of NC 42 and SR 1500.
K-10	205/9.1	Chestnut A.M.E.Z. Church which is southwest of the intersection of SR 1538 and SR 1539.
K-11	193/9.2	Intersection of SR 1538 and SR 1541.
L-1	215/2.8	Christian Chapel Church on SR 1912 which is approximately 1.7 miles southeast from the intersection of SR 1912 and SR 1924.
L-2	232/3.3	On SR 1924 approximately 2.3 miles from the intersection of SR 1924 and SR 1916.
L-3	229/5.1	Intersection of SR 1916 and SR 1924.
L-4	224-225/5.8	Intersection of SR 1916 and SR 1923 at the Cherokee Brick Company.
L-5	219/7.8	Intersection of SR 1500 and SR 1505.

Potential Emergency Environmental Monitoring Sites

Code	Coordinates (Deg/miles)	Description
L-6	236/8.2	Intersection of SR 1504 and SR 1503.
L-7	218/8.7	Intersection of SR 1537 and SR 1505.
L-8	234/9.3	Intersection of SR 1002 and Norfolk Southern Railway, south of the community of Rosser.
M-1	253/5.3	On SR 1916 near Boise Cascade. Site is near the intersection of Seaboard Coast Railroad and Carolina and Northwestern Railway on SR 1916. SR 1916 goes south of SR 1011.
M-2	240/5.7	Cape Fear Power Plant at the end of SR 1925 which intersects SR 1916. Approximately 1.5 miles south of the intersection of SR 1011 and SR 1916.
M-3	252/7.0	On SR 1501 approximately 0.4 mile from the intersection of SR 1500 and SR 1501.
M-4	246/6.8	On SR 1500 approximately 0.7 mile southeast from SR 1501 and approximately 1.4 miles north from the intersection of SR 1500 and SR 1425.
M-5	237/7.2	Intersection of SR 1500 and SR 1425.
M-6	255/7.7	North 0.2 mile from the intersections of SR 1002, SR 1500, and SR 1434 near the Federal Paper Bond Company Plant.
M-7	246/8.0	Northeast 0.2 mile on SR 1502 from the intersection with SR 1002. SR 1502 is approximately 0.8 mile north of the intersection of SR 1002 and SR 1425.
M-8	249/9.7	Intersection of SR 1425 and SR 1423.
M-9	258/10.0	Deep River Fire Department at the intersection of SR 1466 and SR 1423.
N-1	273/1.9	Near the gate at the end of SR 1911. SR 1911 intersects SR 1912 near SR 1011.
N-2	261/2.9	On SR 1912 approximately 0.4 mile north of the intersection of SR 1912 and SR 1924. Transmission line right-of-way to Harris Plant.
N-3	280/3.4	Near the intersection of SR 1011 and SR 1912 around the trash bin container area.
N-4	269/5.5	Intersection of US 1 and SR 1972.

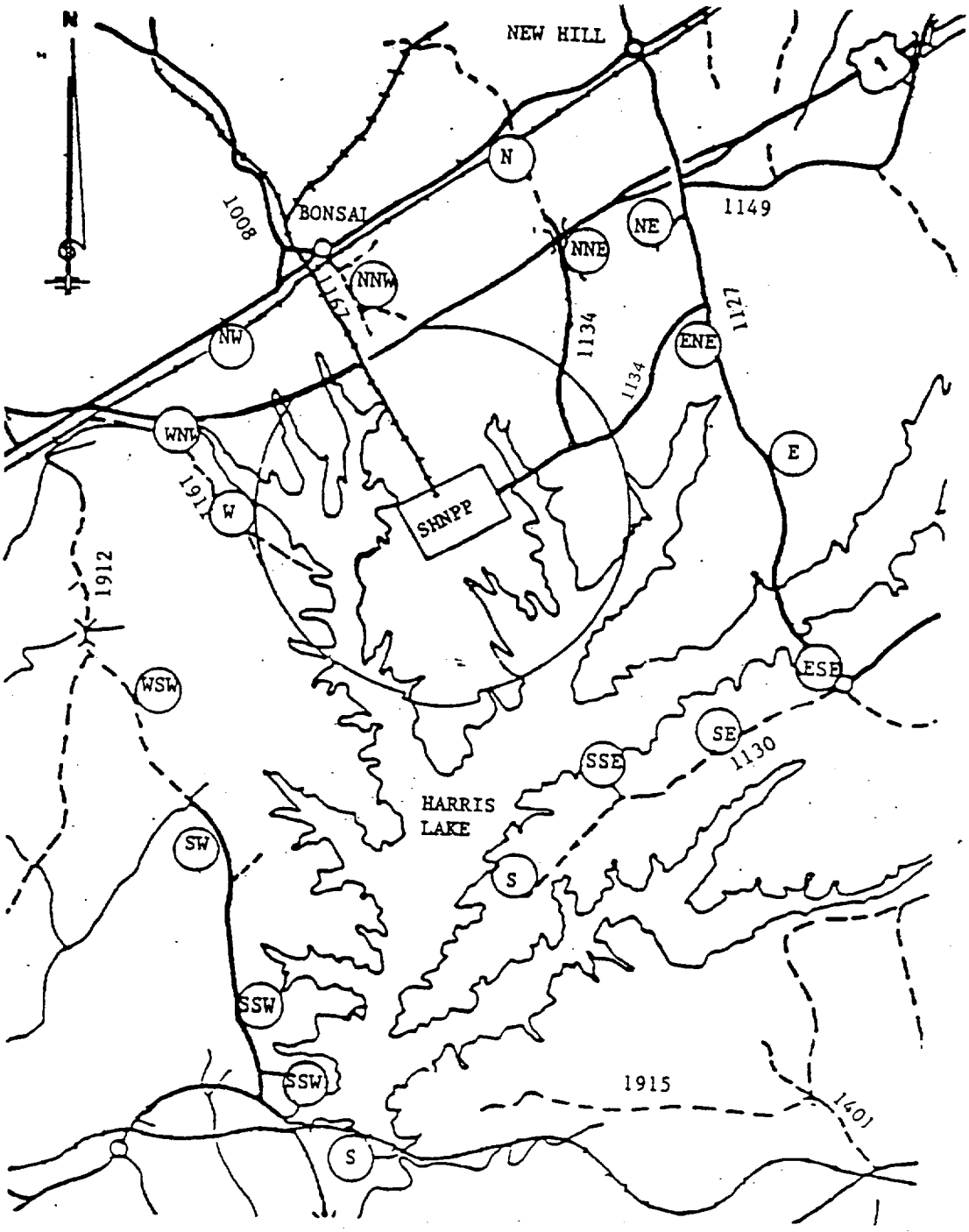
Potential Emergency Environmental Monitoring Sites

Code	Coordinates (Deg/miles)	Description
N-5	269/7.0	At the Moncure School on SR 1931 near the intersection of SR 1931 and SR 1970 and approximately 0.3 mile from the intersection of SR 1931 and US 1.
N-6	272/7.7	Intersection of SR 1970 and SR 1971.
N-7	266/7.8	Intersection of US 1 and SR 1012.
N-8	269/8.0	Near the Haywood Moncure Community Center on SR 1012 approximately 0.7 mile northwest from the intersection of US 1 and SR 1012.
N-9	279/9.2	At the Gum Springs Church on SR 1943 approximately 0.5 mile from the intersection of SR 1943 and SR 1012.
N-10	262/9.4	On SR 1466 approximately 1.0 mile northeast of the intersection of SR 1466 and SR 1423 and approximately 0.55 mile from the intersection of SR 1466 and SR 1469.
P-1	287/2.2	Approximately 0.6 to 0.7 mile from the intersection of SR 1912 and SR 1911 on SR 1911.
P-2	296/2.3	Approximately 0.8 mile northeast of the intersection of US 1 and SR 1011.
P-3	291/4.5	On SR 1909 approximately 0.2 mile from the intersection of SR 1910 and SR 1909.
P-4	293/5.1	New Elam Christian Church located at the intersection of SR 1972 and SR 1910 near Holts Grocery Center.
P-5	301/5.7	At the end of SR 1974 which runs into Lake Jordan. SR 1974 intersects SR 1972.
P-6	283/6.4	By the Lake Jordan Dam which is at the end of SR 1970.
P-7	288/8.0	Intersection of SR 1943 and SR 1977.
P-8	298/9.0	Intersection of SR 1943 and SR 1939.
Q-1	324/1.8	Southeast from community of Bonsal on SR 1167. After crossing over Seaboard Coast Line Railroad, turn southwest (right) into private road leading to a farmhouse (Fish residence) and proceed approximately 0.5 mile west to sharp bend in road.
Q-2	320/4.5	On SR 1008 approximately 0.6 mile northwest from the intersection of SR 1008 and SR 1976. Approximately 1.2 miles southeast from the Jordan Lake Bridge on SR 1008.
Q-3	314/5.7	Intersections of SR 1972, SR 1906, and SR 1907.

Potential Emergency Environmental Monitoring Sites

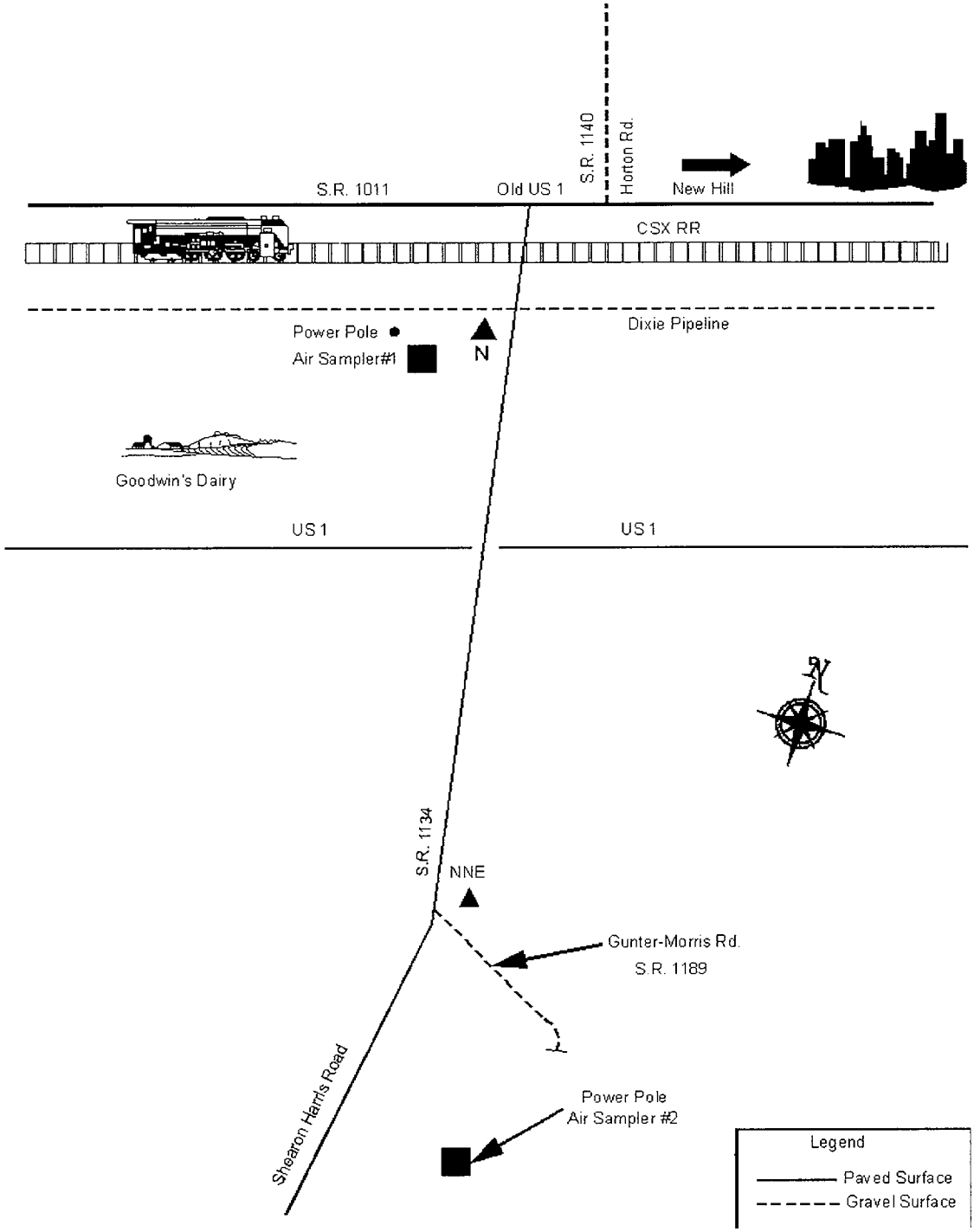
Code	Coordinates (Deg/miles)	Description
Q-4	324/5.9	Ebenezer Church recreation area (state park on Lake Jordan) off SR 1008 approximately 0.4 mile northeast from the bridge on SR 1008 over Lake Jordan.
Q-5	312/7.4	At the boat ramp and fishing dock at the end of SR 1700 on Lake Jordan.
Q-6	313/8.4	Intersection of SR 1700 and SR 1941.
Q-7	326/8.8	On US 64 west of bridge on Lake Jordan approximately 2.7 miles west of the intersections of US 64 and SR 1700 and approximately 1.9 miles east from intersection of US 64 and SR 1700. Sampling area is around boat ramp access road.
Q-8	314/10.0	Intersection of US 64 and SR 1700 (Griffins Crossroads).
R-1	335/1.9	Southeast community of Bonsal near the intersection of SR 1167 and SR 1136.
R-2	329/2.1	Intersection of SR 1008 and SR 1963 in the railroad yard.
R-3	338/4.2	At the end of SR 1903 where the road runs into Lake Jordan.
R-4	336/6.5	Intersection of SR 1008 and SR 1975.
R-5	340/6.2	On SR 1900 approximately 0.7 mile east from the intersection of SR 1008 and SR 1900 (SR 1975 on maps). Approximately 0.3 mile east from the bridge over Lake Jordan fingers on SR 1900.
R-6	341/7.5	Intersection of US 64 and SR 1008, Wilsonville.
R-7	349/7.2	Intersection of US 64 and SR 1745.
R-8	342/8.7	North of the bridge over Lake Jordan on SR 1008 at Bells Church approximately 1.5 miles north from the intersection of US 64 and SR 1008.
R-9	344/9.5	Intersection of SR 1008 and SR 1747.
R-10	346/9.9	Intersection of SR 1003 and SR 1750.

Emergency Environmental Monitoring Location Map



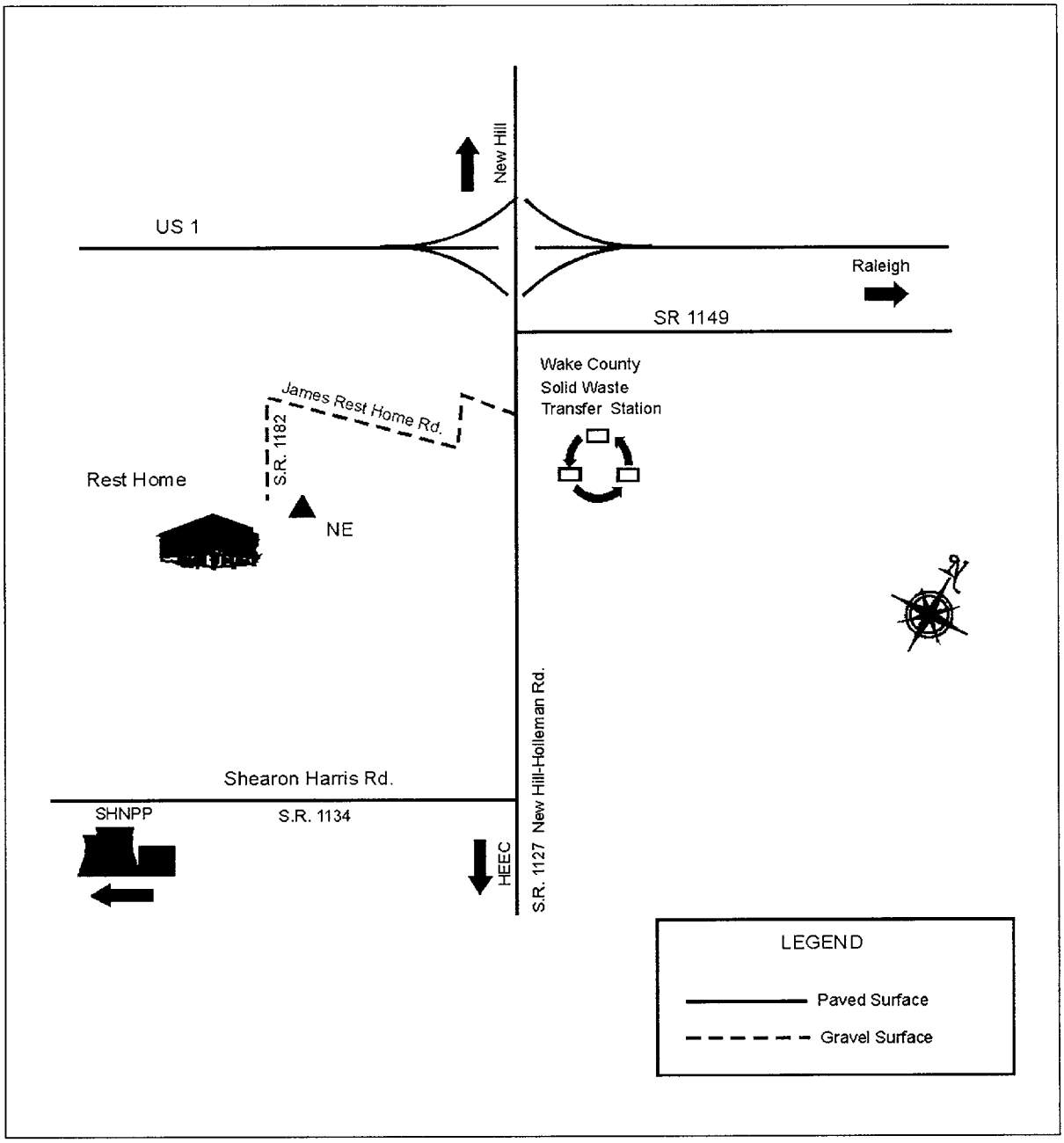
Emergency Environmental Monitoring Location Map

Detailed Locations: North And North Northeast



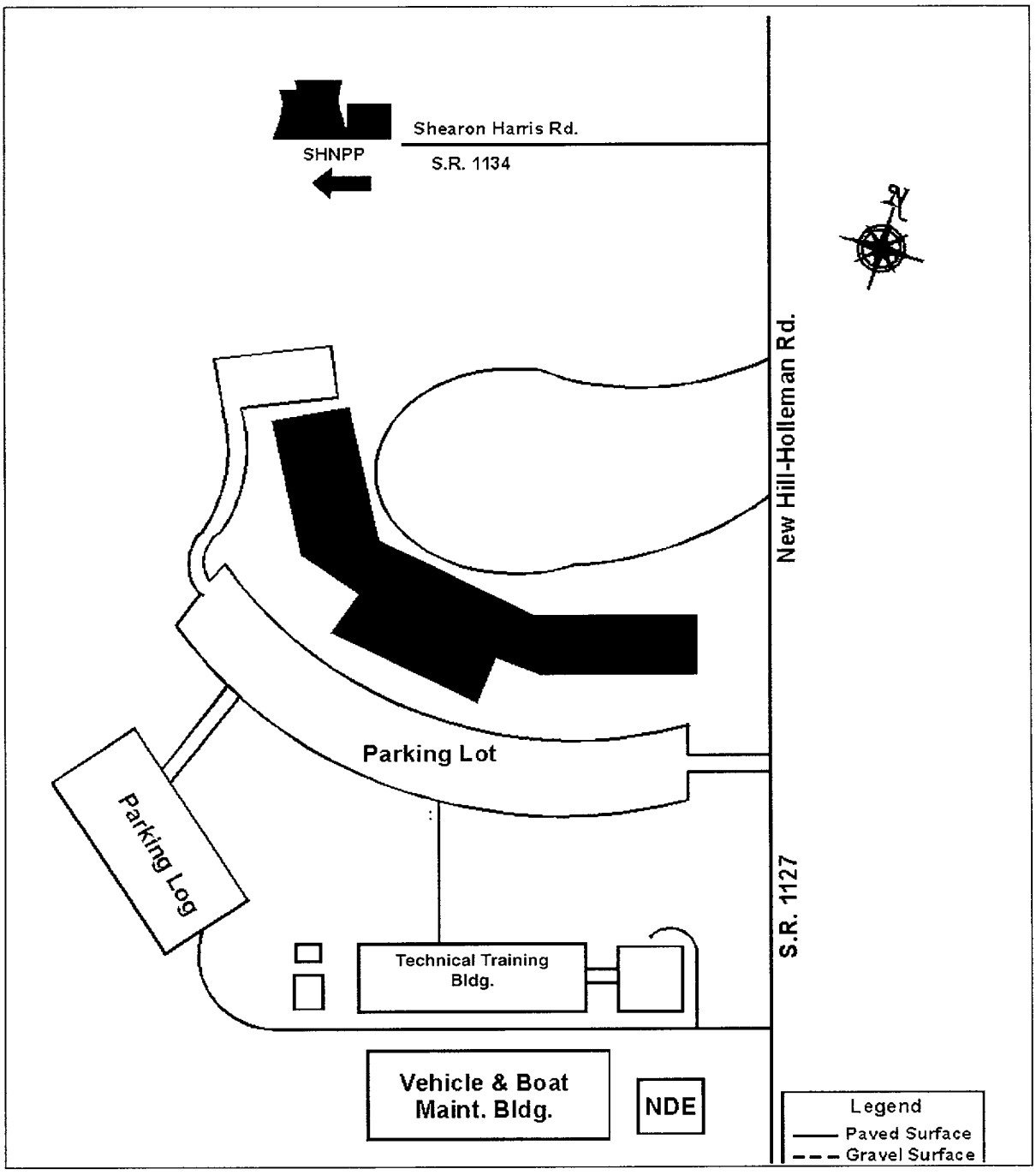
Emergency Environmental Monitoring Location Map

Detailed Location: Northeast



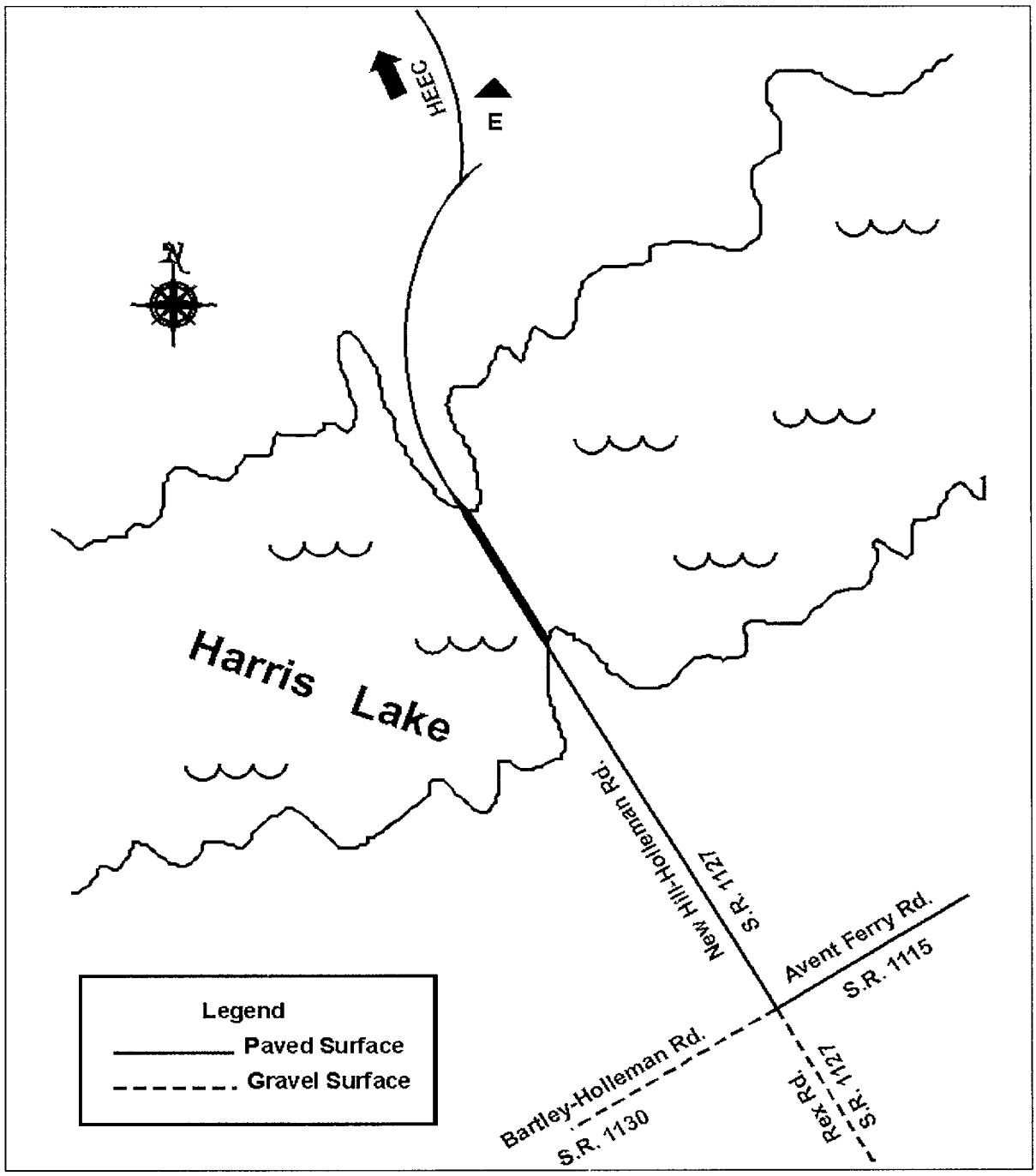
Emergency Environmental Monitoring Location Map

Detailed Location: East Northeast

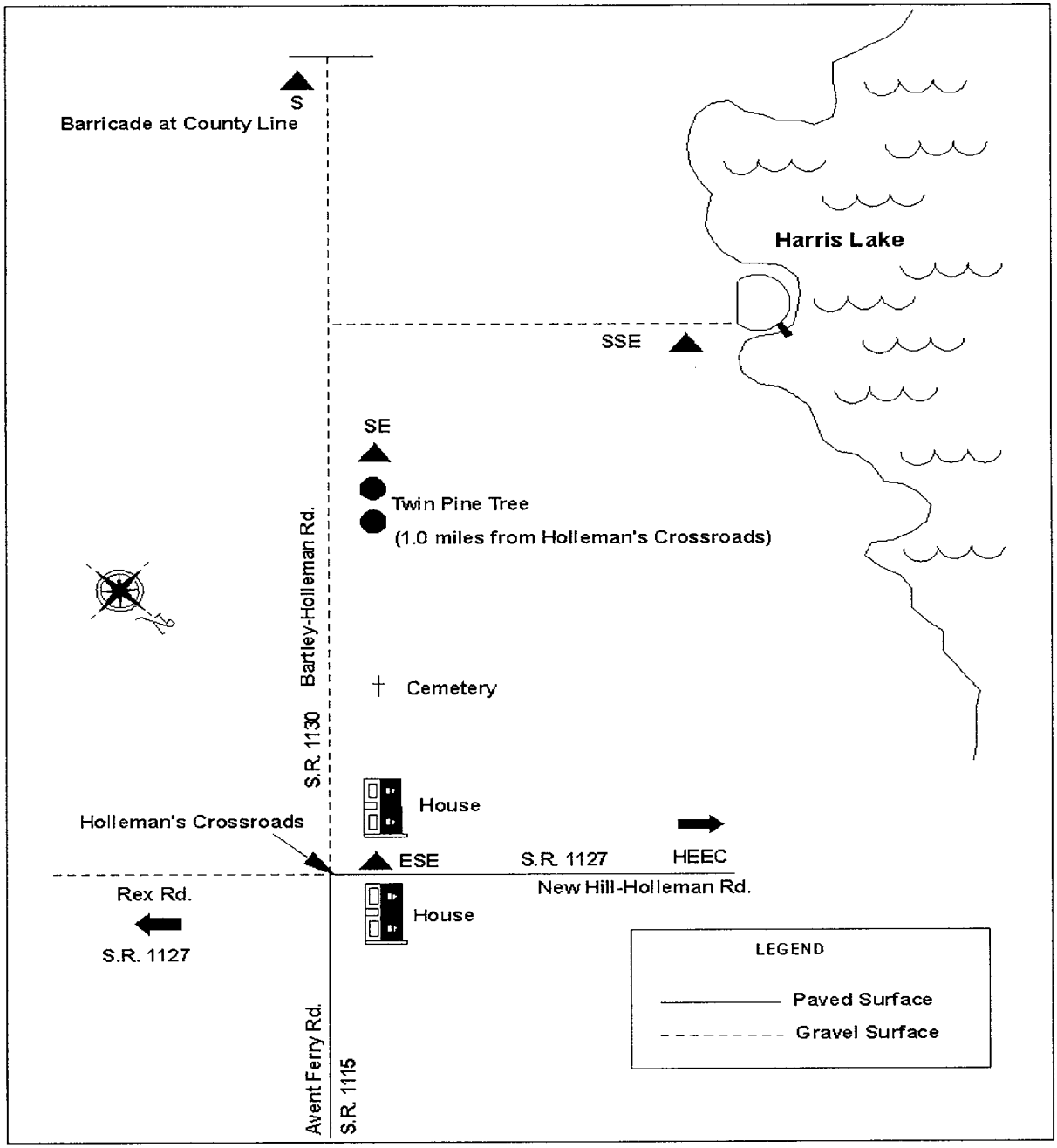


Emergency Environmental Monitoring Location Map

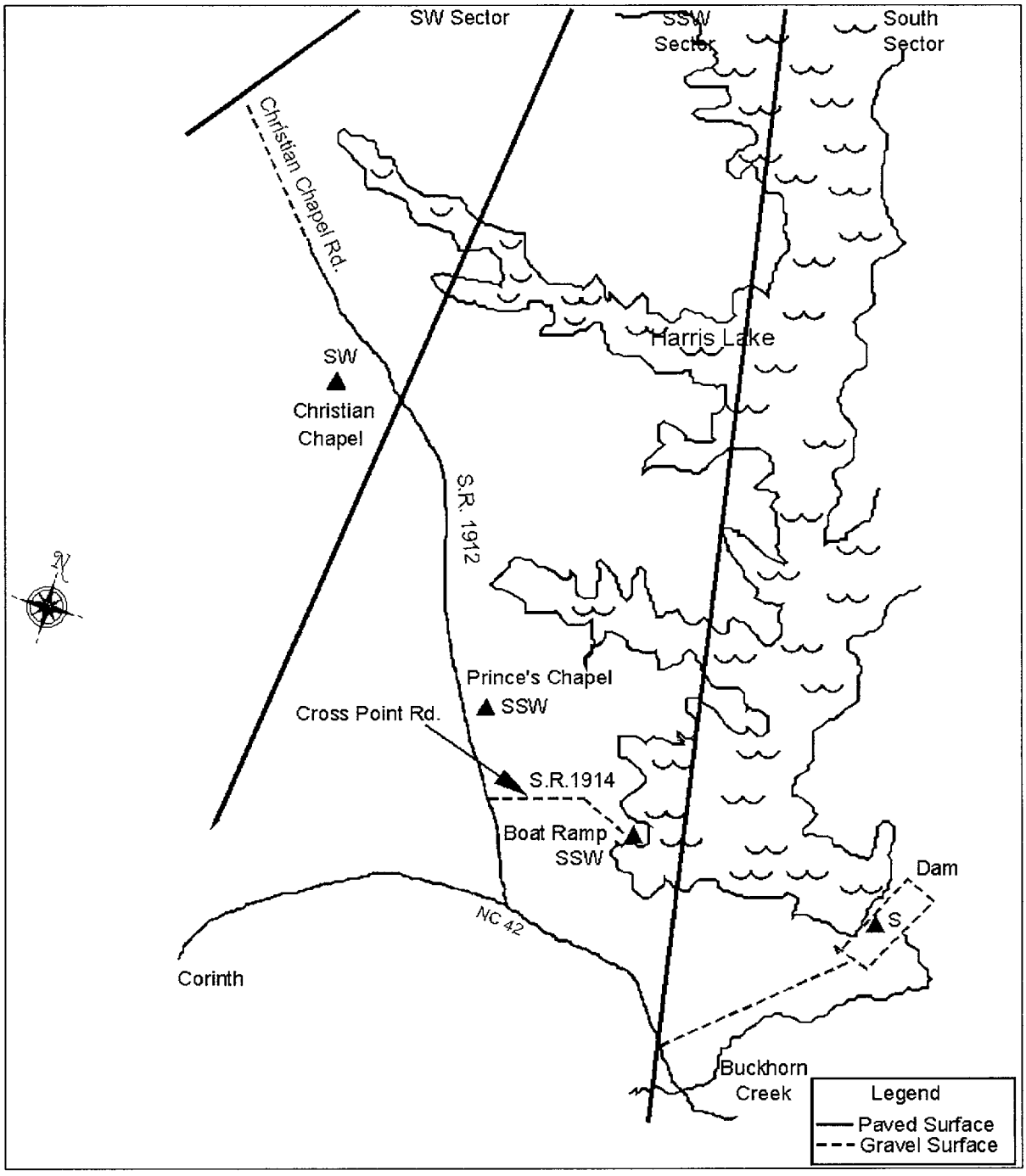
Detailed Location: East



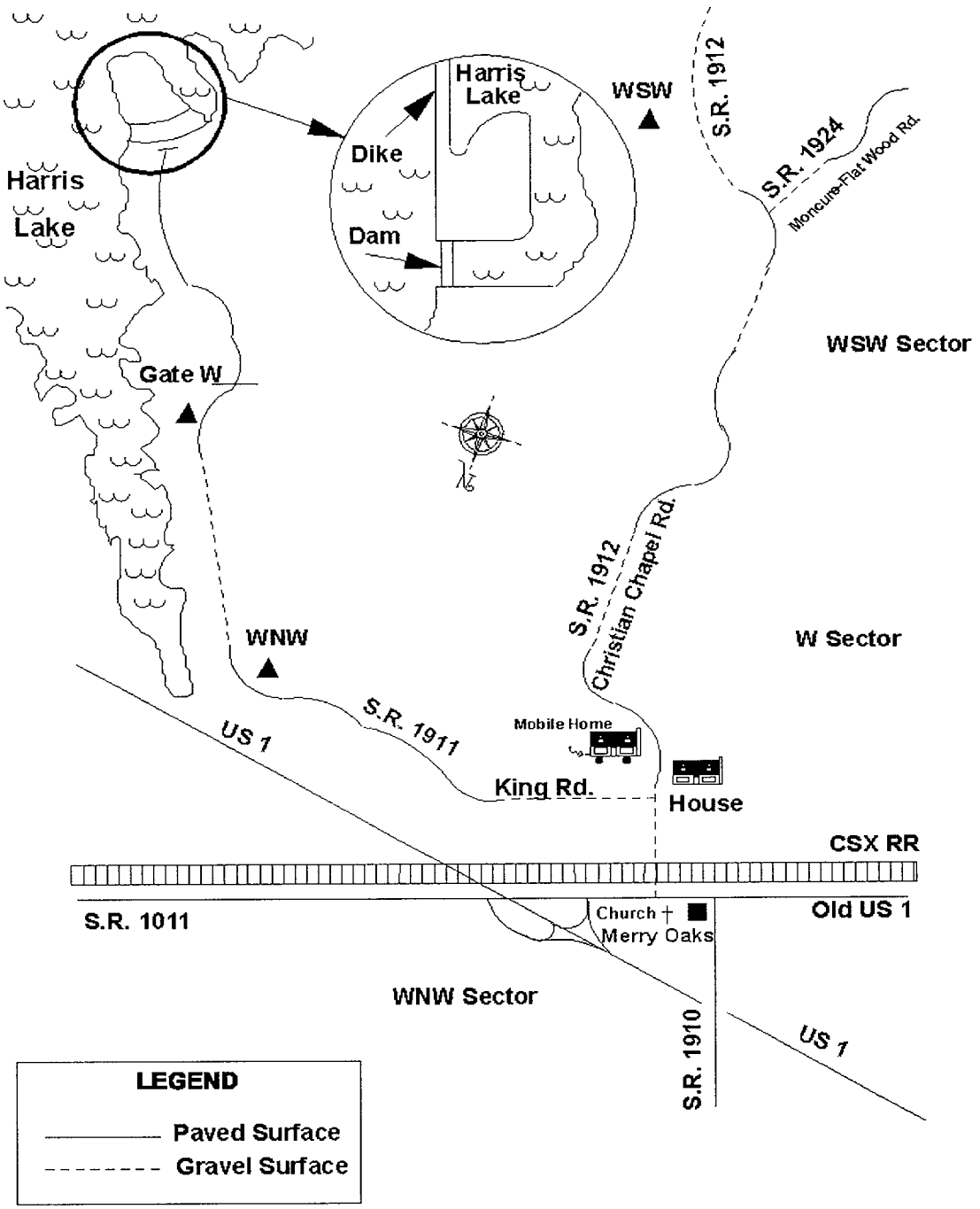
Emergency Environmental Monitoring Location Map
Detailed Locations: East Southeast, Southeast, South Southeast, And South



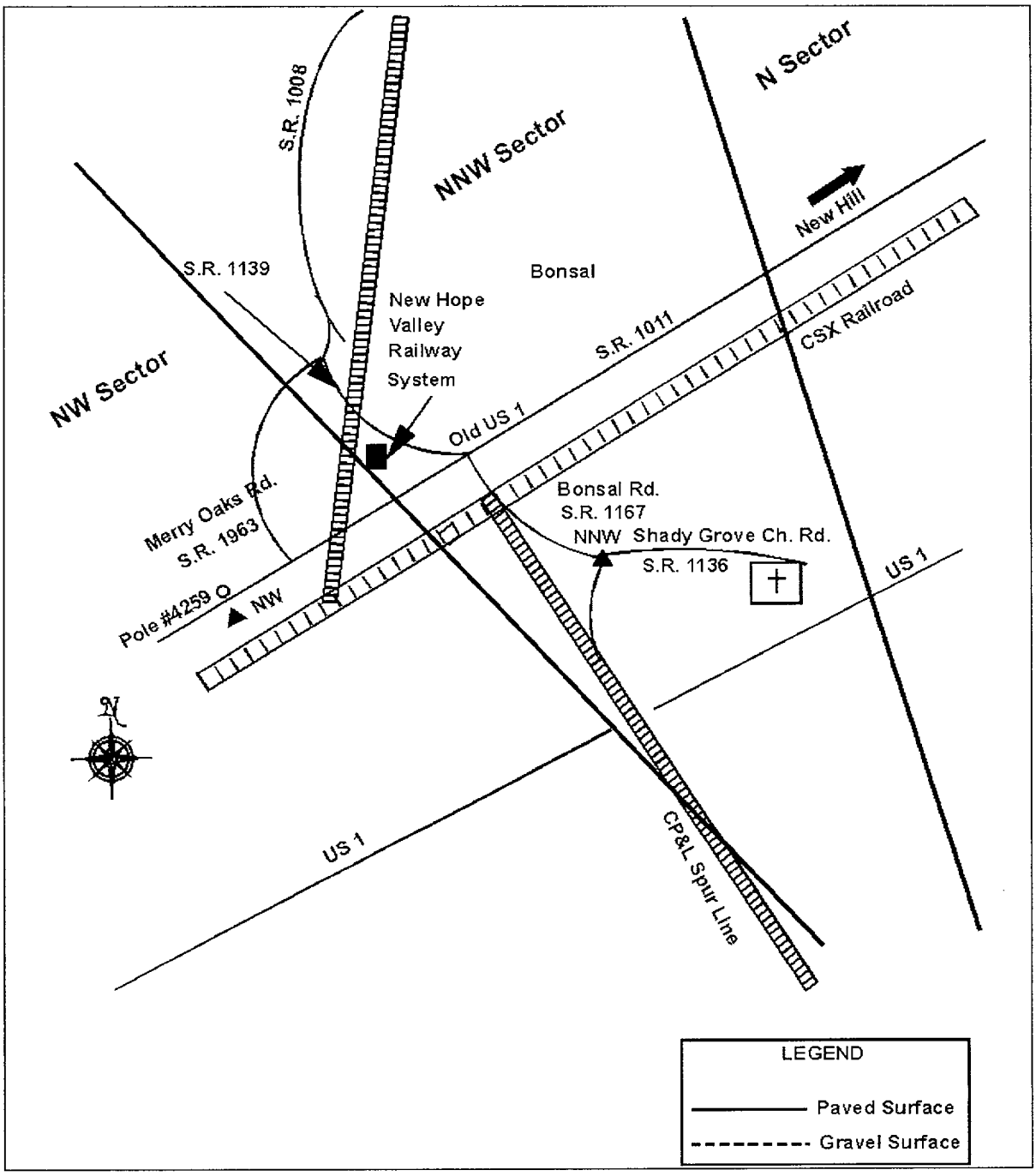
Emergency Environmental Monitoring Location Map
Detailed Locations: South, South Southwest, And Southwest



Emergency Environmental Monitoring Location Map
Detailed Locations: West Southwest, West, And West Northwest



Emergency Environmental Monitoring Location Map
Detailed Locations: Northwest And North Northwest



Directions To Locations For Initial Near-Site Emergency Environmental Monitoring

DOWNWIND	LOCATION DESCRIPTION	DESIGNATOR DEGREE/MILES
N	Near intersection of SR 1134 and SCL R.R. at Dixie Pipeline R/W	007/02.6
NNE	Approximately 0.15 miles south of US 1 on SR 1134 and intersections of unpaved dead end road	002/01.9
NE	Turn west at New Hill Service Center on 1135 - proceed to end of road near rest home	036/02.3
ENE	Parking lot at vehicle maintenance/boat shed at HEEC.	060/02.0
E	Proceed approximately 1 mile south of HEEC on SR 1127 - There is an open knoll on east side of road	081/02.2
ESE	Holleman's Crossroads	117/02.9
SE	Approximately 1.0 mile southwest of Holleman's Crossroads on SR 1130	130/02.4
SSE	Boat landing parking lot on SR 1130	155/02.0
S	Near barricade (Wake Co. line) on SR 1130	173/02.7
S	Near Harris Lake Dam Maintenance lot	190/04.7
SSW	Near CP&L boat landing - east of SR 1912	194/04.3
SSW	Near Prince Chapel on SR 1912	202/03.7
SW	Near Christian Church on SR 1912	220/02.8
WSW	Near intersection of SR 1912 and SR 1924	251/02.8
W	Near gate at end of SR 1911	265/01.4
WNW	Proceed approx. 0.8 mile on SR 1911 from SR 1912 at Merry Oaks	289/02.2
NW	From Bonsal proceed SW on "Old US 1" (SR 1011) 1 mile from railroad overpass. A pull off area is on the railroad side of the road opposite power pole #4259.	318/02.2
NNW	Near Bonsal, near intersection of SR 1167 and SCL RR	332/02.1

Emergency Radiation Work Permit

Page _____ of _____

ERWP # _____
Date _____ Time _____ Requested by _____
Task to be performed _____
_____
Location: _____
Estimated Area Dose Rate: _____ Contamination: _____
Estimated Airborne Activity: Particulate: _____uCi/cc
Iodine: _____uCi/cc Gas: _____uCi/cc
Access Route: _____

Dosimetry	Chest	Head	Thighs	Upper Ext	Lower Ext	Other
0-500 mR and TLD						
0-5 R and TLD						
ED and TLD						
Other						

Protective Clothing		Comments
None		
Lab Coat		
Full PCS		
Wet Suit		
Other		

	Respirators	
None		
FFAP		
SCBA		
Airline		

Personnel Performing Task									
Init. *	Name	Badge No.	Exposure YEAR	Exposure LIFE	Allowed Exposure**	Dose Entry	Time Entry	Dose Exit	Time Exit

Comments: _____
Radiological Control Coordinator _____
Site Emergency Coordinator** _____

* Initialing beside your name signifies that you have read, understood and will comply with this ERWP.
** SEC may approve entries into radiation fields greater than 25 rem/hr or radiation exposures greater than 5 rem TEDE per telecon.

Form PEP-330-10-0

Emergency Radiation Work Permit Continuation Sheet

Page _____ of _____

ERWP # _____ Date _____

Personnel Performing Task									
Init.*	Name	Badge No.	Exposure Year	Exposure Life	Allowed Exposure	Dose Entry	Time Entry	Dose Exit	Time Exit

* Initialing beside your name signifies that you have read, understood and will comply with this ERWP.

Form PEP-330-11-0

Emergency Dosimetry Issue Form

Location: _____

Name	SSN	Date/Time Issued	TLD/SRPD Number	SRPD Dose Out	Date/Time Returned	SRPD Dose In

Form PEP-330-12-0

The FDA's Approved KI Package Insert

THYRO-BLOCK®
TABLETS
(POTASSIUM IODIDE TABLETS, USP)
(pronounced poe-TASS-e-um EYE-oh-dyed)
(abbreviated: KI)

TAKE POTASSIUM IODIDE ONLY WHEN PUBLIC HEALTH OFFICIALS TELL YOU. IN A RADIATION EMERGENCY, RADIOACTIVE IODINE COULD BE RELEASED INTO THE AIR. POTASSIUM IODIDE (A FORM OF IODINE) CAN HELP PROTECT YOU.

IF YOU ARE TOLD TO TAKE THIS MEDICINE, TAKE IT ONE TIME EVERY 24 HOURS. DO NOT TAKE IT MORE OFTEN. MORE WILL NOT HELP YOU AND MAY INCREASE THE RISK OF SIDE EFFECTS. *DO NOT TAKE THIS DRUG IF YOU KNOW YOU ARE ALLERGIC TO IODIDE.* (SEE SIDE EFFECTS BELOW.)

INDICATIONS
THYROID BLOCKING IN A RADIATION EMERGENCY ONLY.

DIRECTIONS FOR USE
Use only as directed by State of local public health authorities in the event of a radiation emergency.

DOSE
Tablets:

ADULTS AND CHILDREN 1 YEAR OF AGE OR OLDER: One (1) tablet once a day. Crush for small children.

BABIES UNDER 1 YEAR OF AGE: One-half (1/2) tablet once a day. Crush first.

Take for 10 days unless directed otherwise by State or local public health authorities.

Store at controlled room temperature between 15° and 30° C (59° to 86° F). Keep container tightly closed and protect from light.

WARNING
Potassium iodide should not be used by people allergic to iodide. Keep out of the reach of children. In case of overdose or allergic reaction, contact a physician or the public health authority.

DESCRIPTION
Each white, round, scored, monogrammed THYRO-BLOCK® TABLET contains 130 mg of potassium iodide. Other ingredients: magnesium stearate, microcrystalline cellulose, silica gel, sodium thiosulfate.

HOW POTASSIUM IODIDE WORKS
Certain forms of iodine help your thyroid gland work right. Most people get the iodine they need from foods, like iodized salt or fish. The thyroid can "store" or hold only a certain amount of iodine.

In a radiation emergency, radioactive iodine may be released in the air. This material may be breathed or swallowed. It may enter the thyroid gland and damage it. The damage would probably not show itself for years. Children are most likely to have thyroid damage.

If you take potassium iodide, it will fill up your thyroid gland. This reduces the chance that harmful radioactive iodine will enter the thyroid gland.

WHO SHOULD NOT TAKE POTASSIUM IODIDE
The only people who should not take potassium iodide are people who know they are allergic to iodide. You may take potassium iodide even if you are taking medicines for a thyroid problem (for example, a thyroid hormone or anti-thyroid drug). Pregnant and nursing women and babies and children may also take this drug.

HOW AND WHEN TO TAKE POTASSIUM IODIDE
Potassium iodide should be taken as soon as possible after public health officials tell you. You should take one dose every 24 hours. More will not help you because the thyroid can "hold" only limited amounts of iodine. Larger doses will increase the risk of side effects. You will probably be told not to take the drug for more than 10 days.

SIDE EFFECTS
Usually, side effects of potassium iodide happen when people take higher doses for a long time. You should be careful not to take more than the recommended dose or take it for longer than you are told. Side effects are unlikely because of the low dose and the short time you will be taking the drug.

Possible side effects include skin rashes, swelling of the salivary glands, and "iodism" (metallic taste, burning mouth and throat, sore teeth and gums, symptoms of a head cold, and sometimes stomach upset and diarrhea).

A few people have an allergic reaction with more serious symptoms. These could be fever and joint pains, or swelling of parts of the face and body and at times severe shortness of breath requiring immediate medical attention.

Taking iodide may rarely cause overactivity of the thyroid gland, underactivity of the thyroid gland, or enlargement of the thyroid gland (goiter).

WHAT TO DO IF SIDE EFFECTS OCCUR
If the side effects are severe or if you have an allergic reaction, stop taking potassium iodide. Then, if possible, call a doctor or public health authority for instructions.

HOW SUPPLIED
THYRO-BLOCK® TABLETS (Potassium Iodide Tablets, USP) are white, round tablets, one side scored, the other side debossed 472 WALLACE, each containing 130 mg potassium iodide. Available in bottles of 14 tablets (NDC C0037-0472-20).

WALLACE LABORATORIES
Division of
CARTER-WALLACE, INC.
Cranbury, New Jersey 08512

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Emergency Environmental Monitoring
TLD Placement Form

TLD Number	Location	Date/Time Placed	Placed by	Date/Time Removed	Removed by	Comments

Form PEP-330-14-0

Thyroid Dose Worksheet

Determine the isotopic concentrations and calculate the dose contribution from each isotope and sum the values.

Isotope	Conc uCi/cc		DCF rem/hr / μCi/cc		Dose Rate mrem/hr		Time in Area hours		Dose mrem
I-131		x	1.3E+09	=		x		=	
I-132		x	7.7E+06	=		x		=	
I-133		x	2.2E+08	=		x		=	
I-134		x	1.3E+06	=		x		=	
I-135		x	3.8E+07	=		x		=	
Te-132		x	2.9E+08	=		x		=	
								Total CDE Thyroid Dose	

Environmental Monitoring Team Startup Checklist

Assembly and Dispatch of environmental Monitoring Teams (Enmon Team) from the Boat Shed Storeroom

Step #	Description	Remarks	Initials
Vehicle Preparation			
1	Locate one of the vehicles assigned to the Enmon Teams at the HEEC parking lot, if available.	Personal vehicles and other CP&L vehicles are permitted to be used in the absence of the dedictaed field monitoring vehicles.	
2	Obtain keys to the vehicle from the key cabinet located within the Boat Shed Storeroom.	Use the 'Primary Use' vehicle keys prior to using the 'Emergency Use' keys	
3	Bring the vehicle to the entrance of the Boat Shed Storeroom for loading.		
Radio Preparation			
4	Remove the radio and install the battery	Radio located in the 'suitcase' style kit. The battery is located on the shelf in the charger.	
5	Turn the radio on and set the channel to '5' or as directed.		
6	Attempt to contact 'Control' as soon as possible.	The Environmental Field Coordinator (Control) may not be available in the beginning of the emergency due to response time.	
Instrumentation Preparation			
7	Obtain the following meters or equivalent: • L19 microR • RO2A • L177 'Frisker'		
8	Perform the following checks on the instruments: • Calibration dates • Battery checks • Visual checks • Response/operability checks (using available source)	Source is located in the Storeroom tied up with cable or equivalent	
9	Document results on Form PEP-330-3 as appropriate.		

Environmental Monitoring Team Startup Checklist

Step #	Description	Remarks	Initials
Dosimetry Preparations Note: If you already have your site thermoluminescent detector (TLD) with you, do not take another one form the storage shield.			
10	Obtain a TLD from the storage shield, install in the TLD holder, and place on the upper front of the body.	TLD located on the floor below the key box. The holder is located in the toll box.	
11	Obtain a self-reading pocket dosimeter (SRPD) and re-zero, if applicable. Ensure you take both ranges of dosimetry. Wear the SRPD near the TLD.	Ranges include 0-500 mrem and 0-20 rem.	
12	Obtain extra TLDs and place in the emergency kit.	These can be used for environmental TLDs posted in the field.	
Gas Generator Preparations/Air Sampler Checks			
13	Remove generator from the Boat Shed Storeroom and place outside in an open area.		
14	Check oil level.	Extra oil can be found in the hazardous material storage locker outside the Storeroom. The key for the locker can be found on the key ring.	
15	Check gasoline level.	Gas can be found in the hazardous material storage locker outside the Storeroom. The key for the locker can be found on the key ring**. For additional gas, the vehicle key ring has the universal gas pump[key to allow fuel of vehicle/generator anytime.**	
16	Start the generator outside per instructions.		
17	Plug in the sir sampler to the generator and let run for ~ 1 minute under load.		
18	Turn off the generator and let cool for ~ 5 minutes if loading the generator inside the vehicle.		

Environmental Monitoring Team Startup Checklist

Step #	Description	Remarks	Initials
Loading the Emergency Vehicle/Final Preparations for Departure			
19	Load the following equipment inside the emergency vehicle: • 'Suitcase' emergency kit and contents • Large 'equipment' emergency kit and contents • All meters and sir sampler • Polar coordinates map • Sample container • Gas can • FFNP respirators (2) • Emergency Dosimetry Issue Forms (PEP-330-12) • Water bucket • Sampling markers with PVC container • Gas generator, if loaded inside vehicle • Radios with batteries • Dosimetry, both TLDs and two ranges of SRPDs • PEP-330 procedure • KI tablets (1 bottle per person) Load the following equipment outside the emergency vehicle: • Vehicle platform, if desired (key for the hitch key can be found in the lock and the key cabinet) • Gas generator, if loaded on platform	KI tablets located in the climate control cooler/warmer	
Briefing			
20	Arrive at the EOF and sign-in on the board.		
21	Receive briefing prior to departure.	Briefing can be performed by the DPTL, EFC or the RCM	
22	Verify communications with Control prior to departure.		

Environmental Monitoring Team Startup Checklist

Step #	Description	Remarks	Initials
Departure			
23	Proceed to locations as directed, use the polar coordinate maps and attachments 7,8, and 9 to assist with field deployment. Attachment 7 may be useful if working with State Agenices.		

Items to be Resolved

KI Issuance Form

Name	SSN	Date/Time Issued	KI Lot #	KI Expiration Date (if applicable)	Are you allergic to iodine? Example - shellfish

Revision Summary for PEP-330, Rev.5

This revision simplified the calculations needed to measure thyroid dose. It also clarified guidance for habitability so that it is consistent with the PA announcements. New KI tablet do not have expiration dates, guidance is provided to allow for this. The FDA's Approved KI Package Insert was updated to reflect the 5/94 guidance. A KI Issuance form was added so that personnel can be tracked when issued KI. Differentiation between the use of electronic ERWPs and manual ERWPs was provided. 'Rem' was corrected to 'rem'.

Section	Revision
3.2.1.	Changed 'Write necessary Emergency Radiation Work Permits (ERWP) using Attachments 10 and 11.' To 'Write necessary Emergency Radiation Work Permits (ERWP) using guidance provided in HPP-600 or Attachments 10 and 11.'
3.2.7.	Changed 'Record exposures from dosimetry on the ERWP or transmit the data verbally to the RCC who shall have the information transcribed onto the ERWP.' To 'Record exposures from dosimetry on the ERWP or via RIMS sign out process. This information may be verbally transmitted to the RCC who shall have the information transcribed onto the ERWP.'
3.4.2.	Changed 'Resurvey the facility when there is a change in classification or a release has occurred. Follow up should be performed as needed.' To Resurvey the facility if there is a potential for an airborne radiological release or a release has occurred. Follow up should be performed as needed.
3.5.	Changed the note NOTE: KI should be considered as a potential dose reducing option for any situation in which airborne radioactive iodine is present (an additional ALARA option) to statements on the guidance for controlling doses to emergency workers
3.5.1.d.	Changed Thyroid dose, in rem, can be estimated from isotopic concentrations (in μCi/cc) as follows: (Table)' to 'Thyroid dose, in mrem, can be determined from isotopic concentrations (in μCi/cc) using Attachment 15.
3.5.1.e.	Deleted 'Total thyroid dose is the sum of the individual doses from each of the isotopes above. See Attachment 15.
3.5.2.	Changed 'KI should be administered to emergency workers if by calculation, measurement or estimation the total dose to the thyroid will exceed 50 rem' to 'KI should be administered to emergency workers to maintain dose to the thyroid below 50 rem.
3.5.2.e.	Added (if available) to 'Lot number and expiration date (if available) of the KI administered.'
3.6.1.	Activities for the assembly and dispatch of the enmon teams has been moved to Att 16 as a checklist.
3.6.2.d.	Corrected last step to be step 7.

Revision Summary for PEP-330, Rev.5

Section	Revision
3.6.5	Corrected last step to be step c.
5.0	Added the reference HPP-600, "Preparation of Radiation Work Permits"
Att 7	K-1 changed Frances Chapel The Church to Prince's Chapel Church
Att 13	Revised the FDA's Approved KI Package Insert with Rev 5/94 information
Att 15	Revised the Thyroid Dose Worksheet to simplify calculations
Att 16	Added the Environmental Monitoring Team Startup Checklist
Att 17	Added KI Issuance Form