



LR-E06-0304  
July 27, 2006

Mr. Stuart A. Richards, Deputy Director  
Division of Inspection and Regional Support  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Subject: Groundwater Protection – Data Collection Questionnaire

DOCKET NO: 50-272 and 50-311

Dear Mr. Richards:

The nuclear industry, in conjunction with the Nuclear Energy Institute, has developed a questionnaire to facilitate the collection of groundwater data at commercial nuclear reactor sites. The objective of the questionnaire is to compile baseline information about the current status of site programs for monitoring and protecting groundwater and to share that information with NRC. The completed questionnaire for Salem Generating Station is enclosed.

This submittal contains no new regulatory commitments.

Please contact me at (856) 339-2086 if you have questions about the enclosed information.

Sincerely,

A handwritten signature in black ink, appearing to read "Thomas P. Joyce".

Thomas P. Joyce  
Site Vice President - Salem

Enclosure

c: USNRC Document Control Desk  
Washington, DC 20555

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**Industry Groundwater Protection Initiative  
Voluntary Data Collection Questionnaire**

**Plant: Hope Creek Generating Station**

- 1. Briefly describe the program and/or methods used for detection of leakage or spills from plant systems, structures, and components that have a potential for an inadvertent release of radioactivity from plant operations into groundwater.**
  - As part of a systematic assessment, Hope Creek Generating Station performed a technical review of each plant system and structure to determine if inadvertent releases from these systems could potentially impact the environment. Each system was evaluated and those systems components that contain or could potentially contain radioactively contaminated liquids were identified and assessed to determine if a potential pathway to the environment existed. A cross-functional team made up of personnel from Operations, Engineering, Chemistry, and Radiation Protection performed the technical review.
  - The plant systems, structures, processes, and components that have a potential for an inadvertent release are routinely monitored to detect leakage or spills through an expansive radiation monitoring system (RMS), operator rounds and employee observations. Additionally, engineered control systems such as secondary containment, spill prevention, overflow detection and leak detection are used to detect and prevent releases from entering the environment.
  - Examples of the surveillance programs and engineering controls employed at Hope Creek are provided below:
    - Operations personnel perform station inspections at least once per shift. These inspections include identification and reporting of any leaks or spills. The response to any leaks or spills may include immediate clean-up, notification of supervision, a request for assistance from on-site staff or a spill response contractor and the preparation of a Notification that initiates corrective action.
    - System Engineers perform periodic walkdowns of the systems for which they are responsible. These rounds include the requirement to identify and report leaks and spills. Leaks and spills are addressed through: immediate clean-up, notifying supervision for assistance, writing a work request or initiating a Notification.

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**2. Briefly describe the program and/or methods for monitoring onsite groundwater for the presence of radioactivity released from plant operations.**

- Salem has installed 36 wells associated with monitoring tritium concentrations detected in the shallow groundwater related to the Unit 1 Spent Fuel Pool leak, and the recovery and processing of that water. The tritium was discovered and reported in 2003. The frequency at which the wells are sampled and analyzed is documented in a monitoring plan that is periodically reviewed with the New Jersey Department of Environmental Protection – Bureau of Nuclear Engineering (NJDEP-BNE) and Nuclear Regulatory Commission (NRC), and ranges between monthly and semi-annually. Based on monitoring results, PSEG adaptively manages the remediation actions and sampling frequencies.
- Salem has installed eight (8) additional monitoring wells associated with monitoring for plant related radionuclide concentrations in the shallow groundwater. These wells were recently installed as part of a site-wide environmental assessment project. The wells were first sampled and analyzed in April-June of 2006. These monitoring wells will be sampled periodically for analyses of low level plant related radioactivity.
- The Lower Limits of Detection (LLDs) used during the systematic site-wide environmental assessment were:

Nuclide	Typical MDA (pCi/l)
Tritium (H-3)	200
Total Strontium – 89/90	2
Manganese (MN-54)	15
Ferrous Citrate (FE-59)	30
Cobalt (CO-58)	15
Cobalt (CO-60)	15
Zinc (ZN-65)	30
Zirconium (ZR-95)	30
Niobium (NB-95)	15
Cesium (CS-134)	15
Cesium (CS-137)	18
Barium (BA-140)	60
Lanthanum (LA-140)	15

There are no off-site residential, irrigation, or commercial wells being routinely sampled as part of any special monitoring for tritium at this time. Surface water, ground water and potable water from a local municipality are sampled and analyzed as part of the Radiological Environmental Monitoring Program (REMP) for the site.

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- 3. If applicable, briefly summarize any occurrences of inadvertent releases of radioactive liquids that had the potential to reach groundwater and have been documented in accordance with 10 CFR 50.75(g).**
- The Salem Generating Station records inadvertent release of radioactive liquids in accordance with 10 CFR 50.75(g). As part of the systematic assessment, a third party environmental engineering firm was contracted to evaluate historic releases, if any, and determine if a potential pathway to the environment existed. Those releases that were determined to have potentially impacted groundwater were subsequently investigated as part of the systematic assessment. The Salem Unit 1 Spent Fuel Pool leak is included in the 10 CFR 50.75(g) records, and summarized in the response to number 4, below.
  - A copy of the Salem site – wide environmental assessment report will be provided to the NRC.
- 4. If applicable, briefly summarize the circumstances associated with any onsite or offsite groundwater monitoring result indicating a concentration in groundwater of radioactivity released from plant operations that exceeds the maximum contaminant level (MCL) established by the USEPA for drinking water.**

Concentrations of tritium were detected in the shallow groundwater near Salem Unit 1 in early 2003 above the MCL established by the USEPA for drinking water (and the New Jersey Groundwater Quality Criteria). This information was reported to the NJDEP and the NRC. PSEG Nuclear conducted and completed a comprehensive investigation in accordance with NJDEP site remediation regulations to determine the source and extent of the tritium in the groundwater. The Remedial Investigation Report submitted to the NJDEP and NRC in April 2004 concluded that the contamination was attributable to clogged Salem Unit 1 Spent Fuel Pool (SFP) drains, which had been repaired in February 2003, effectively stopping the leak to the environment at that time. SFP telltale drains, seismic gap inventory, and monitoring of onsite wells / Groundwater Recovery System tritium concentrations are conducted routinely under this approved remedial action plan.

PSEG Nuclear has been in ongoing dialogue with the NRC and NJDEP since the time that a Salem Unit 1 SFP leak was suspected. Ongoing monitoring and actions have been taken to prevent a recurrence. Sample points and drains have been installed in the Unit 1 and Unit 2 seismic gaps to provide data that confirm, on an ongoing basis, that SFP leakage to the environment has not reoccurred, and that SFP water remains within the plant structures. There is no evidence that tritium contaminated water above NJDEP's ground water standards has migrated to the station boundary or below the first layer of the clay confining geologic unit at approximately 35 feet depth.

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- 5. Briefly describe any remediation efforts undertaken or planned to reduce or eliminate levels of radioactivity resulting from plant operations in soil or groundwater onsite or offsite.**

The Remedial Action Work Plan (RAWP) associated with the Salem tritium remediation has been approved by the NJDEP. The RAWP details plans for the removal and processing of groundwater, long-term monitoring, and a schedule for periodic reports to the NJDEP and NRC of the groundwater contamination remediation progress. A groundwater recovery system has been installed and routine periodic reporting activities are occurring in accordance with the approved RAWP, demonstrating containment and removal of the tritiated groundwater. No radioactivity from Salem's operations has been detected offsite in soil or groundwater at levels in excess of the regulatory limits.