STP Nuclear Operating Company
South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

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NOC-AE-06002047

Stuart A. Richards
Deputy Director, Division of Inspection and Regional Support
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

South Texas Project
Units 1 and 2
Groundwater Protection – Data Collection Questionnaire

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 the NRC. The completed questionnaire for South Texas Project (STP) is enclosed.

There are no commitments in this letter.

If you have any questions regarding the enclosed information please contact Robyn Savage at (361) 972-7438 or me at (361) 972-7849.

E. D. Halpin
Site Vice President/
Plant General Manager

Attachment: Industry Groundwater Protection Initiative Questionnaire

STI: 32031607

cc:
(paper copy)

Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, Texas 76011-8064

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Senior Resident Inspector
U. S. Nuclear Regulatory Commission
P. O. Box 289, Mail Code: MN116
Wadsworth, TX 77483

C. M. Canady
City of Austin
Electric Utility Department
721 Barton Springs Road
Austin, TX 78704

Richard A. Ratliff
Bureau of Radiation Control
Texas Department of State Health Services
1100 West 49th Street
Austin, TX 78756-3189

Honorable Greg Westmoreland
Matagorda County Judge
1700 7th Street, Room 301
Bay City TX 77414-5034

(electronic copy)

A. H. Gutterman, Esquire
Morgan, Lewis & Bockius LLP

Mohan C. Thadani
U. S. Nuclear Regulatory Commission

Steve Winn
Christine Jacobs
Eddy Daniels
NRG South Texas LP

J. J. Nesrsta
R. K. Temple
E. Alarcon
City Public Service

Jon C. Wood
Cox Smith Matthews

C. Kirksey
City of Austin

Ralph Andersen
Nuclear Energy Institute

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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.

Response: Plant systems are monitored as a routine part of Operations rounds. Plant procedures direct operations personnel to check for process piping leakage in the course of their normal operator rounds.

Plant procedures and general employee training provide guidance to station personnel who discover a spill or release. A person who discovers a spill or release is directed to:

a. Notify the appropriate control room
b. Identify the material and source of the spill if possible
c. Stop the leak or discharge if possible
d. Prevent entry of the spill or release in surface waterways or the plant storm drain system if possible
e. Contain the spill or release.

System Engineers also perform periodic walkdowns of the systems for which they are responsible. These walkdowns include monitoring for leakage and spills.

The spent fuel pool is physically separated from the fuel handling building base mat by approximately 50 ft in elevation and is designed with a leakage detection system which is routinely monitored.

Systems which normally do not contain radioactivity but have the potential to become contaminated due to leakage from radioactive systems are routinely sampled and analyzed for radionuclides to detect leakage under station programs.

Station ground water and water leaving the station via storm drains or other discharge pathways are routinely sampled and analyzed for radionuclides.

Station personnel utilize the station's Corrective Action Program to document equipment and component leaks detected through any of the monitoring programs and to generate work orders to perform repairs as necessary.

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

Response: In the Owner Controlled Area there are seven hundred and sixty shallow relief wells associated with the Main Cooling Reservoir (MCR) dike. Approximately three hundred and sixty test wells, are distributed throughout the site in the shallow aquifer, including approximately twenty-five inside the Protected Area. One relief well and two test wells, have historically been monitored in the Radiological Environmental Monitoring Program and are all on the south side

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of the Main Cooling Reservoir. Drinking water is from deep water wells on the north and west side of the MCR and they are monitored. The relief well, the two shallow aquifer test wells and the drinking water wells are monitored on a quarterly basis and are analyzed for tritium and gamma emitters. The drinking water sample is also analyzed for gross beta.

Six additional test wells have been added to the quarterly sampling and analysis schedule. Three of the test wells are located inside the Protected Area near the units and associated piping. The other three test wells are located in the Owner Controlled Area with one located in the east, west, and north portions of the site. One shallow well, located offsite and southeast of the Main Cooling Reservoir is sampled and analyzed at the landowner's discretion.

The **Lower Limits of Detection** (LLD) listed below are applicable to groundwater only.

Isotope or Measurement	**Lower Limit of Detection (pCi/kg)***
Gross beta	2
Tritium	300
I-131	10
Cs-134	2
Cs-137	2
Mn-54	2
Fe-59	6
Co-58	2
Co-60	2
Zn-65	5
Zr-95	4
Nb-95	3
Ba-140	5

*LLD values are typical values from the 2004 Annual Environmental Operating Report and minimum detectable activity achieved is normally at the LLD level. These typical values are about 5 times more sensitive than required by the Offsite Dose Calculation Manual (ODCM) except tritium which is about 10 times more sensitive. Lower LLDs are used to facilitate trending since tritium is expected to migrate through the shallow ground water aquifer and gamma emitters could also be present.

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).**

Response: No inadvertent releases of radioactive liquids have been documented in accordance with 10 CFR 50.75(g). Minor radioactive spills have occurred outside of buildings. These spills are documented in the Corrective Action Program and have been cleaned up to the extent practical by returning the liquid to the appropriate treatment system and/or excavation of the contaminated material. Leakage from the secondary system is quantified and reported in the Annual Radioactive Effluent Release Report. Details (nuclides, quantities, forms,

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concentrations) have not been recorded in accordance with 10 CFR 50.75(g) because significant contamination did not remain after cleanup procedures were implemented or there was no reasonable likelihood that contaminants spread to inaccessible areas.

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 US EPA for drinking water.**

Response: No onsite or offsite groundwater monitoring results have detected radioactivity released from plant operations that exceeds the maximum contaminant level established by the US EPA for drinking water. Tritium has been detected in groundwater onsite and all results have been below the EPA drinking water standard and the reportable level for NRC as described in the Offsite Dose Calculation Manual (ODCM) and continue to be below those levels to date. Tritium in the shallow aquifer is expected as a result of the reservoir design and is addressed as part of the licensing basis and is analyzed as an effluent pathway as described in No. 5 below. Tritium was first detected in groundwater in a reservoir relief well sample collected in 1990. This relief well was replaced by another more dependable sample station in 1995. These positive results were included in the Annual Radiological Environmental Operating Report. In 1999 and 2000, tritium was detected in two additional test wells and these results were documented in the corrective action program. As a result of recent industry experience, samples were collected from test wells inside the Protected Area during December of 2005. Tritium was identified and this information was also documented in the corrective action program. None of these results exceeded the maximum contaminant level established by the US EPA for drinking water. The test wells sampled are in the shallow aquifer and are within approximately two hundred yards of the dike surrounding the seven thousand acre Main Cooling Reservoir which is within the Owner Controlled Area. Since onsite results south of the reservoir are still well below the regulatory limits, test wells have not been established in the shallow aquifer outside of the Owner Controlled Area.

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.**

Response: Other than the cleanup of minor spills described in Item No. 3 above, no remediation efforts have been necessary and none are currently planned. The Updated Final Safety Analysis Report (UFSAR) describes the process of radionuclides entering the shallow aquifer via Main Cooling Reservoir seepage and this pathway is analyzed as a radioactive effluent discharge path. The UFSAR states that the expected maximum reservoir tritium concentration is 21,000 pCi/l, which is about two times current reservoir concentrations. The reservoir and associated groundwater monitoring results continue to be well below the maximum contaminant level established by the US EPA for drinking water. The USFAR discusses monitoring practices for groundwater and that if hazardous levels of contamination are ever detected at site boundaries, additional monitoring stations would be installed downstream to track migration and dilution [UFSAR 2.4.13.3.2.2, Table 11A-1, 2.4.13.4].

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There has been no tritium or other inadvertent radioactive liquid releases, spills, or leaks, from the plant into the public domain. All discharges of radioactive effluents have been associated with routine permitted releases and permitted beneficial land application activities.