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Mr. Stuart A. Richards, Deputy Director
Division of Inspection and Regional Support
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DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNITS 1, 2, AND 3
DOMINION ENERGY KEWAUNEE, INC.
KEWAUNEE POWER STATION
VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNITS 1 AND 2
SURRY POWER STATION UNITS 1 AND 2
GROUNDWATER PROTECTION – DATA COLLECTION QUESTIONNAIRES

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 questionnaires for the Millstone, Kewaunee, North Anna, and Surry Power Stations are attached.

Should you have any questions regarding this submittal, please contact Mr. David A. Sommers at (804) 273-2823.

Very truly yours,

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Attachments: (4)

Commitments made by this letter: None

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Attachment 1

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Millstone Power Station

NEI Groundwater protection Initiative Questionnaire Response

Dominion Nuclear Connecticut, Inc.

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

Plant: Millstone Power 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.

Millstone has several programs and methods used for detection of leakage or spills. These include:

- A containment groundwater under-drains system for Unit 3 designed to collect water from under the containment. The groundwater collected from this system is routinely sampled and analyzed for radionuclides, including tritium.
- Chemistry surveillances that include monthly sampling and analysis of storm water in the yard drains (catch basins).
- Routine surveillances performed by Operations during rounds to monitor equipment integrity. It is also an expectation that Health Physics, Engineering and Chemistry personnel will monitor system or component leakage as part of their duties. Leaks or component degradation are reported via the corrective action system.
- An inspection program for outdoor storage tanks (e.g., Refueling Water Storage Tanks) which requires an external inspection once per three (3) years and an internal inspection once per ten (10) years.
- A corrective action system where significant occurrences of leakage or spills are documented.

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

Millstone has 71 wells onsite, of which 30 are inside the Protected Area. These wells were originally installed for monitoring of potential chemical pollutants. The wells inside the Protected Area and those in the ground water flow path from the Protected Area, are also monitored for radioactivity.

There are two well water monitoring programs:

- The Radiological Environmental Monitoring Program requires sampling and analysis of well water. This is described in the Millstone Radiological Effluent Monitoring and Offsite Dose Calculation Manual (REMOCM). Two selected well locations are rotated among several wells nearby potential sources of radiological contaminants (e.g., RWSTs, fuel pools, station stack sump). Required sampling is for gamma emitters and tritium. These wells are currently sampled quarterly and include analyses for Strontium 89 and 90. Required and typical detection levels are:

<u>NUCLIDE</u>	<u>REMP REQUIRED LLD (pCi/liter)</u>	<u>Typical REM MDA (pCi/liter)</u>
H-3	2000	~1000
Mn-54	15	~5
Fe-59	30	~14
Co-58,60	15	~6
Zn-65	30	~26
Zr-95	30	~8
Nb-95	15	~10

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I-131	15	~10
Cs-134	15	~6
Cs-137	18	~8
Ba-140	60	~9
La-140	15	~10
Sr-89	N/A	~6
Sr-90	N/A	~1.5

- In support of previous projects, quarterly sampling for chemical pollutants was conducted for many of these wells. This sampling has been scaled back to 10 wells that were last sampled in June 2006. Two of these wells are located inside the Protected Area. Since the chemical analysis of these samples is normally performed offsite, the samples had to meet unconditional radioactive release (“free release”) standards. This required gamma and tritium analyses at the above listed lower limits of detection (LLDs).

In addition to the well water analyses, samples are taken monthly from catch basins and weekly from the Unit 3 containment under-drains. These samples are analyzed for tritium and gamma emitters. Catch basins that drain to the quarry are analyzed to effluent LLDs, while the catch basins that drain directly into the Long Island Sound are counted to environmental LLD’s. The under-drains samples are also counted to environmental LLDs. The required LLDs are:

NUCLIDE	Effluent LLD* (pCi/liter)	Environmental LLD* (pCi/liter)
H-3	10000**	2000
Mn-54	500	15
Fe-59	500	30
Co-58	500	15
Co-60	500	15
Zn-65	500	30
Zr-95	NA	30
Nb-95	NA	15
Mo-99	500	NA
I-131	1000	15
Cs-134	500	15
Cs-137	500	18
Ba-140	NA	60
La-140	NA	15
Ce-141	500	NA
Ce-144	5000	NA

* Excluding H-3, typical detection limits are near these values for these samples

**All water samples onsite are analyzed to an Environmental LLD for H-3

NA – not applicable

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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).**

DNC maintains records of those instances where inadvertent release of radioactive liquids has occurred as required by 10 CFR 50.75(g). These records are available onsite at any time for NRC review. A review of those records identified 10 occurrences where either the volume or source of the release would have exceeded a reporting threshold defined for this voluntary initiative. These have been cleaned up to the extent that any remaining contamination has been judged to not represent a threat to the environment or to offsite and onsite personnel. Further remediation as appropriate will occur when the site is decommissioned.

- 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.**

There have been no instances of onsite or offsite groundwater monitoring which indicated a concentration exceeding the MCL established by the EPA.

- 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.**

Remediation of soil/gravel/asphalt has occurred in response to some of the spills/leaks as described in the response to item 3. Documentation of the occurrences in the 10 CFR 50.75(g) file will be used during decommissioning for final remediation of the spill areas. Remediation considerations will be a component of the station's groundwater initiative action plan.

Attachment 2

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Kewaunee Power Station

NEI Groundwater protection Initiative Questionnaire Response

Dominion Energy Kewaunee, Inc.

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

Plant: Kewaunee Power 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.

KPS has several programs / methods used for detection of leakage or spills. These include:

- Operations personnel monitor for leakage during routine surveillances of their assigned area. Immediate actions include attempts to terminate and clean-up leakage.
- As part of our Boron Leak Identification program, all personnel are expected to monitor borated systems for degradation.
- A program to monitor accessible portions of storm drains for in-leakage, i.e., they are monitored for water during dry seasons when water would not be expected to be in them.
- A program to monitor water systems that are not expected to be radioactive for radioactivity, i.e., steam generator blow-down, turbine building sump discharge, and potable water.
- A corrective action program to document issues found as part of plant operation.

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

Onsite groundwater monitoring is conducted as part of the Radiological Environmental Monitoring Manual. Each of these is described below.

Kewaunee samples two on-site wells. These wells provide the drinking water supply for the site. Sampling occurs quarterly, and analysis is for gamma isotopic, tritium, gross beta, gross alpha, and Sr 89/90.

Five (5) on-site surface water locations are also sampled monthly. These include two creeks just north and south of the plant, an additional creek further north, the condenser discharge and 500' north of the condenser discharge. These are all analyzed for gross beta, gamma isotopic, tritium and Sr 89/90.

The required Lower Limits of Detection (LLDs) and an example of typical Minimum Detectable Activities (MDA) are:

NUCLIDE	REQUIRED LLD (pCi/L)	MDA (pCi/L)
H-3	2000	~160
Mn-54	15	<15
Fe-59	30	<30
Co-58, 60	15	<15
Zn-65	30	<30
Zr-95	15	<15

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Nb-95	15	<15
Cs-134	15	<10
Cs-137	18	<10
Ba-La-140	15	<15
Sr-89	N/A	<0.9
Sr-90	N/A	<0.6

- 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).**

Kewaunee has no documentation of occurrences of inadvertent releases of radioactive liquids where either the volume or source of the release would have exceeded a reporting threshold defined for this voluntary initiative. Kewaunee is currently reviewing records and performing interviews to ensure it has properly identified and classified all occurrences that might be considered in this initiative.

- 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.**

Analysis of all the samples noted in response to question 2 above have been at or below the LLD values used by Kewaunee's Radiological Environmental Monitoring Program vendor.

- 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.**

Kewaunee has not identified a need to perform any remediation activities at this time.

Attachment 3

Serial No. 06-636

North Anna Power Station

NEI Groundwater protection Initiative Questionnaire Response

Virginia Electric and Power Company

Industry Groundwater Protection Initiative Voluntary Data Collection Questionnaire

Plant: North Anna Power 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.**

North Anna has several programs used for detection of leakage or spills. These include:

- Operations personnel perform routine surveillance for leaks during rounds. It is also an expectation that Health Physics, Engineering and Chemistry personnel will monitor system or component leakage as part of their duties. Leaks or component degradation are reported via the corrective action system.
- As part of the Boric Acid Control Program all personnel are expected to monitor and report degradation of borated systems.
- A program was established in response to Information Notice 91-40, "Contamination of Non-Radioactive System and Resulting Potential for an Unmonitored, Uncontrolled Release to the Environment." It is designed to monitor normally non-radioactive systems for radioactivity. It measures radioactivity to the effluent Lower Limits of Detection (LLD), as specified in the Offsite Dose Calculation Manual.

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

Onsite groundwater monitoring is conducted as part of:

- The Radiological Environmental Monitoring Program,
- An agreement with Louisa County, Virginia, and
- A response to Information Notice 91-40.

The groundwater monitoring program is described below.

The groundwater well at Environmental Station 01A, located 0.64 miles Southeast of U-1 Containment is sampled quarterly and analyzed for tritium (H-3) and gamma emitters. It is analyzed annually for Sr-89 and Sr-90. Its location was selected to monitor infiltration of lake water into ground water. This is a non-drinking water well.

As part of an agreement with Louisa County, Virginia, two wells are sampled annually at the ISFSI. These samples are analyzed for H-3, gamma emitters, and Sr-89/-90 to environmental LLD levels as specified in the Offsite Dose Calculation Manual. The required LLDs and an example of achieved Minimum Detectable Activities, (MDAs), for the wells at Station 01A and the ISFSI are:

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NUCLIDE	REQUIRED LLD (pCi/L)	MDA (SAMPLE L-5636) (pCi/L)
H-3	2000	~1200
Mn-54	15	~5
Fe-59	30	~8
Co-58,60	15	~4
Zn-65	30	~13
Zr-95	30	~6
Nb-95	15	~5
Cs-134	15	~5
Cs-137	18	~4
Ba-140	60	~8
La-140	15	~9
Sr-89	N/A	~8
Sr-90	N/A	~1.5

In addition to these, samples are taken quarterly from the storm drain out falls (3) and subsurface drains as part of implementation of Information Notice 91-40. These samples are analyzed for tritium and gamma emitters. Under this program, no radioactivity above MDA has been detected in the storm drain out falls or subsurface drains. The required LLDs and typical MDAs achieved are:

NUCLIDE	REQUIRED LLD (pCi/L)	MDA (pCi/L)
H-3	10000	3000
Mn-54	500	10
Fe-59	500	20
Co-58	500	15
Co-60	500	15
Zn-65	500	25
Mo-99	500	100
I-131	1000	20
Cs-134	500	10
Cs-137	500	20
Ce-141	500	50
Ce-144	500	300

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).**

North Anna maintains records of those instances where inadvertent release of radioactive liquids has occurred as required by 10 CFR 50.75(g). Those records are available onsite

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at any time for NRC review. A review of those records identified 56 occurrences where either the volume or source of the release would have exceeded a reporting threshold defined for this voluntary initiative. These occurrences have been cleaned up to the extent that any remaining contamination has been judged not to represent a threat to the environment or to offsite and onsite personnel. Further remediation as appropriate will occur when the site is decommissioned.

- 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.**

There have been no instances of onsite or offsite groundwater monitoring which indicated a concentration exceeding the MCL established by the EPA.

- 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.**

Remediation of soil/gravel/asphalt has occurred in response to some of the spills/leaks reported in the response to item 3 above. Documentation of the occurrences in the 10 CFR 50.75(g) file will be used during decommissioning to remediate spill areas. Remediation considerations will be a component of the station's groundwater initiative action plan.

Attachment 4

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Surry Power Station

NEI Groundwater protection Initiative Questionnaire Response

Virginia Electric and Power Company

Industry Groundwater Protection Initiative
Voluntary Data Collection Questionnaire

Plant: Surry Power 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.

Surry has several programs and methods used for detection of leakage or spills. These include:

- A subsurface drainage system to prevent excessive hydrostatic pressure on plant structures. Water collected from this system is transferred to the storm drains system where it is sampled and analyzed for gamma emitters weekly and analyzed for tritium monthly in accordance with plant procedures.
- Engineers perform periodic walkdowns of the systems for which they are responsible. These walkdowns include identification of steam, water and boric acid leakage from systems and components. Leakage is reported to Operations and entered into the corrective action system.
- Operations personnel monitor for leakage during routine surveillances of their assigned area. Immediate actions include attempts to terminate and clean-up leakage. Leakage is reported and entered into the corrective action system.
- Health Physics and Chemistry personnel perform plant walkdowns. It is part of their duties to monitor for leaks and spills. Leakage is reported to Operations and entered into the corrective action system.
- ASME section XI testing includes reactor containment leak rate and integrity checks performed to identify and quantify leakage. Refueling water storage tanks (RWST) and selected underground piping associated with the RWST are also monitored.

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

- Onsite groundwater monitoring is conducted as part of the Radiological Environmental Monitoring Program (REMP). The onsite domestic water system that provides drinking water to the plant is sampled quarterly. Also, an offsite residential drinking water well is sampled quarterly as part of the REMP. The residential deep water well is located 1.9 miles NNE of Unit #1 containment. These samples are analyzed for gamma emitters and tritium. The required Lower Limit of Detection (LLDs) and typical Minimum Detectable Activity (MDAs) for these samples are:

NUCLIDE	LLD, pCi/L	MDA, pCi/L
H-3	2,000	1,300
Mn-54	15	5.1
Fe-59	30	10
Co-58	15	4.1
Co-60	15	4.9
Zn-65	30	11

Zr-95	30	6.9
Nb-95	15	5.2
I-131	1	0.6
Cs-134	15	6.0
Cs-137	18	4.1
Ba-140	60	7.8
La-140	15	9.0

- Onsite water monitoring is also conducted as part of the Radiological Effluent Technical Specification program. Water from the subsurface drain and Turbine Building drain systems are released through the Storm Drain system. Storm drain out falls are sampled and analyzed weekly for gamma emitters and analyzed for tritium monthly. The required LLDs and typical MDAs for these samples are:

NUCLIDE	LLD, pCi/L	MDA, pCi/L
H-3	10,000	1630
Mn-54	500	12
Fe-59	500	21
Co-58	500	18
Co-60	500	19
Zn-65	500	20
Mo-99	500	179
Cs-134	500	9
Cs-137	500	11
Ce-141	500	15
Ce-144	500	55
I-131	1,000	12
Sr-89	50	43
Sr-90	50	33
Fe-55	1,000	330

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).

- Surry maintains records of those instances where inadvertent release of radioactive liquids has occurred as required by 10 CFR 50.75(g). Those records are available onsite at any time for NRC review. A review of those records identified 8 occurrences where either the volume or source of the release would have exceeded a reporting threshold defined for this voluntary initiative. These occurrences have been cleaned up to the extent that any remaining contamination has been judged to not represent a threat to the environment or to offsite and onsite personnel. Further remediation as appropriate will occur when the site is decommissioned.

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) by the USEPA for drinking water.

- There have been no instances of onsite or offsite groundwater monitoring which indicated a concentration exceeding the MCL established by the EPA.

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.

- Remediation of soil/gravel/asphalt has occurred in response to some of the spills/leaks reported in the response to item 3 above. Documentation of the occurrences in the 10 CFR 50.75(g) file will be used during decommissioning to remediate spill areas. Remediation considerations will be a component of the station's groundwater initiative action plan.