

August 24, 2016

Dana Stalcup, Director
Division of Assessment and Remediation
Office of Superfund Remediation
and Technology Innovation
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
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Washington, DC 20460

SUBJECT: CONSULTATION ON THE DECOMMISSIONING OF THE ZION NUCLEAR
POWER STATION, UNITS 1 AND 2, IN ZION, ILLINOIS

Dear Mr. Stalcup:

This letter notifies you of the decommissioning oversight actions that the U.S. Nuclear Regulatory Commission (NRC) has taken and intends to take, for the Zion Nuclear Power Station (ZNPS), Units 1 and 2, in Zion, Illinois.

On October 9, 2002, the NRC and the U.S. Environmental Protection Agency (EPA) entered into a Memorandum of Understanding (MOU) on "Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites." Under the MOU, EPA agreed to continue its deferral policy of not listing sites on the Comprehensive Environmental Response, Compensation, and Liability Act's National Priorities List that are subject to NRC's licensing authority. The MOU provides that, unless an NRC-licensed site exceeds any of three trigger criteria contained in the MOU, the EPA agrees to a policy of deferral to NRC decision-making on decommissioning without the need for consultation.

For sites that trigger the criteria in the MOU, the NRC will consult with the EPA at two points in the decommissioning process: (1) prior to NRC approval of the License Termination Plan (LTP) or decommissioning plan, which the NRC terms Level 1 consultation; and (2) following completion of the Final Status Survey (FSS), which the NRC terms Level 2 consultation.

We are sending this letter as our Level 1 consultation for the Zion site, because the licensee's proposed Derived Concentration Guideline Levels (DCGLs) for certain radionuclides for this site exceed the soil concentration values in Table 1 of the MOU.

The ZNPS consists of two (Units 1 and 2) Pressurized Water Reactors (PWR). The station is located near the city of Zion in northeast Illinois on the west shore of Lake Michigan. The site is approximately 40 miles north of Chicago, Illinois and 42 miles south of Milwaukee, Wisconsin. In September 1996, ZNPS Unit 2 was shut-down after approximately 23 years of operation. In February 1997, ZNPS Unit 1 was shut-down after approximately 24 years of operation. In early 1998, in accordance with section 50.82(a)(1)(i) and (ii) of title 10 of the Code of Federal Regulations (10 CFR), Exelon Generating Company, LLC. (Exelon) notified the NRC of the permanent cessation of operations at the ZNPS and the permanent removal of

all spent fuel assemblies from the reactor vessels to the spent fuel pool. On September 1, 2010, the NRC transferred Facility Operating License Numbers DPR-39 and DPR-48 from Exelon to ZionSolutions, LLC (ZS). The ZNPS was acquired by ZS to conduct the decommissioning of the facility and then return the decommissioned site back to Exelon. The spent fuel has been moved from the spent fuel pool to the Independent Spent Fuel Storage Installation. Decommissioning of ZNPS is scheduled to be completed in 2018. On December 19, 2014, the licensee submitted its LTP (ADAMS Accession Number ML15005A336).

ZS is proposing to decontaminate the ZNPS site to meet the requirements for unrestricted use under 10 CFR 20.1402. The licensee is using a resident farmer scenario because future land use of the site has not been determined. The NRC has compared the licensee's DCGLs to the MOU's soil concentration levels for the residential use scenario for the purposes of evaluating the need for consultation. Reliance upon the residential use scenario is consistent with the instructions for Table 1, "Consultation Triggers for Residential and Commercial/Industrial Soil Contamination," in the MOU, which state that the users of this table should select the appropriate column (i.e., land use scenario) based on the site's reasonably anticipated land use.

The proposed DCGLs are provided in the enclosure. The proposed DCGLs for two of the five radionuclides currently exceed the MOU soil concentration levels for the residential land use scenario. The NRC staff note that in determining the Level-1 soil consultation, the sum of fraction approach is applied for all radionuclides other than Ra-226, Th-232, and total uranium. The sum of fractions assuming the proposed Surface Soil DCGL values is 5.3. Prior to the NRC's termination of the license, the licensee must show that the Zion site will be in compliance with the NRC's criteria in 10 CFR 20.1402. The criteria in 10 CFR 20.1402 provide that the licensee must demonstrate, through its FSS in accordance with 10 CFR 50.82(a)(11)(ii), that the residual radioactivity that is distinguishable from background radiation results in an all-pathways total effective dose equivalent to an average member of the critical group that does not exceed 0.25 millisieverts per year (25 millirem per year). In addition, the 10 CFR 20.1402 criteria require that the residual radioactivity has been reduced to levels that are As Low As Reasonably Achievable (ALARA). The dose criteria in 10 CFR 20.1402 are fully protective of the public health and safety, and were the result of a comprehensive rulemaking (62 FR 39058; July 21, 1997), including an accompanying generic environmental impact statement.

Individuals at a decommissioned site are expected to receive doses substantially below the constraint level because of the application of the ALARA principle, conservative dose modeling assumptions, and the nature of the cleanup process itself, which often reduces residual contamination levels significantly below site DCGLs. Additionally, the residual radioactivity at the site is expected to be much lower than the approved DCGL values because meeting the "not to exceed 25 millirem per year" criteria must be demonstrated using an all pathways, sum of the fractions approach. The DCGLs in the LTP represent the maximum levels for each radionuclide without considering the existence of other radionuclides. Thus, in applying the sum of the fraction requirement, the actual cleanup values will be reduced to ensure that the potential dose from all residual radioactivity at the site from all media is less than 25 millirem per year.

On-site monitoring wells have been sampled as part of an ongoing groundwater monitoring program since 2006. There have been sample results in some groundwater monitoring wells that have detected H-3 and Sr-90 above the detection limit but both have been well below the

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EPA Maximum Contaminant Level for that radionuclide. Therefore, the NRC is not requesting a consultation on groundwater.

Following your staff's review of the enclosure and other relevant information, as specified in Section V.D.1 of the MOU, please send us your views on the Zion site within 90 days of receiving this notification.

As part of the LTP review and approval process, the NRC staff will prepare an Environmental Assessment (EA), which will be published in the *Federal Register*. The staff anticipates approving the LTP at the conclusion of the consultation process. Following site remediation activities, the licensee will submit an FSS. The NRC staff will review information contained in this survey report and will compare the remaining levels of residual radioactivity to the MOU trigger levels. If the FSS measurements show that the remaining radionuclide concentrations are below the values set forth in Table 1 of the MOU, then the NRC will proceed to terminate the ZNPS, Units 1 and 2 license and the site will be released for unrestricted use. The NRC will inform the EPA of such findings. If the FSS measurements show that any of the remaining radionuclide concentrations are above the values set forth in Table 1 of the MOU, then the NRC will engage in Level 2 consultation with the EPA to identify and resolve any remaining issues. In the meantime, if you have any questions regarding this letter or the remediation activities at the ZNPS site please contact Mr. Bruce Watson, Chief, Reactor Decommissioning Branch, at (301) 415-6221.

Sincerely,

/RA/

John R. Tappert, Director
Division of Decommissioning, Uranium Recovery,
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket Nos.: 50-295 and 50-304
License Nos.: DPR-39 and DPR-48

Enclosure: Zion Proposed Cleanup Values

cc: Zion Service List

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ADAMS Accession No. ML16084A308

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NAME	J. Hickman	C. Holston	J. Clements	K. Pinkston	M. Meyer
DATE	3/ 25 /16	3/ 25 /16	3/ 25 /16	3/ 29 /16	3/ 25 /16
OFFICE	NMSS	NMSS:BC	OGC	NMSS:DD	NMSS:D
NAME	K. Conway	B. Watson	APessin	A. Kock	J. Tappert
DATE	3/ 25 /16	3/ 30 /16	8/ 01 /16	8/11/16	8/24/16

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Zion Nuclear Power Station
Proposed Soil Cleanup Values (DCGLs) (pCi/g)

Radionuclide	Surface Soil (DCGL)	Subsurface Soil (DCGL)	EPA MOU*
Co-60	4.7	3.8	4
Cs-134	7.5	4.9	16
Cs-137	15.7	8.5	6
Ni-63	3988	847	9480
Sr-90	14.3	1.8	23

* Residential

Enclosure