

March 31, 2016

Mr. John Sauger  
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SUBJECT: ZION NUCLEAR POWER STATION, UNITS 1 AND 2 – APPROVAL OF  
PARTIAL SITE RELEASE FOR FACILITY OPERATING LICENSE NOS. DPR-39  
AND DPR-49 (TAC NOS. L53070 AND L53071)

Dear Mr. Sauger:

By letter to the U.S. Nuclear Regulatory Commission (NRC) dated August 27, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15243A029), as supplemented by letter dated January 26, 2016 (ADAMS Accession No. ML16028A192), ZionSolutions, LLC (ZS, the licensee) submitted a request to the NRC for approval of a partial site release at Zion Nuclear Power Station (ZNPS), Units 1 and 2. The proposed action would remove and release the portions of the site which have been classified as radiologically non-impacted from its Part 50 license.

Specifically, Section 50.83 of Title 10 of the *Code of Federal Regulations* (10 CFR) requires written approval from the NRC prior to release for unrestricted use of any part of a site for a nuclear power plant before receiving approval of a license termination plan. The licensee's application contained: (1) results of evaluations performed to determine the effect of releasing the property including dose to the public, effluent release, and environmental monitoring; (2) a description of the land to be released; (3) a schedule for release of the property; (4) results of the 10 CFR 50.59 evaluation performed; and (5) environmental impact conclusions.

In accordance with 10 CFR 50.83, the NRC staff reviewed the overall effects that the release would have on radiation doses and whether the classification of the release as non-impacted was justified. The NRC also held a public meeting in the vicinity of ZNPS to obtain public comments associated with the partial site release. The public comments are addressed in Enclosure 2 of this letter. None of the comments resulted in the NRC making changes to the review of the partial site release request. The NRC staff has completed its review of the ZNPS partial site release and approves the proposed release of the 214 acres.

The NRC's review did not identify any environmental concerns associated with the release of the 214 acre property. The environmental impacts associated with the plant will not change as a result of this property release. Therefore, the environmental impacts associated with the proposed release of the property are bounded by previously issued environmental impact statements. Based on the above, the NRC determined that preparation of an Environmental Assessment was not required.

You are reminded that Section 50.75(g) of 10 CFR Part 50 requires keeping records of information important to the safe and effective decommissioning of the facility, which includes the plant site, until the license is terminated by the Commission. Also, 10 CFR 50.75(g)(4)(iii) requires records of: the release and final disposition of any property recorded in § 50.75(g)(4)(i); the historical site assessment performed for the release; radiation surveys performed to support release of the property; submittals to the NRC made in accordance with § 50.83; and the methods employed to ensure that the property met the radiological criteria of 10 CFR Part 20, Subpart E, at the time the property was released. A copy of the Safety Evaluation is also enclosed.

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-49

Enclosures:

1. Safety Evaluation
2. Comments on the Partial Site Release

cc: Zion Service List w/enclosures

J. Sauger

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The NRC's review did not identify any environmental concerns associated with the release of the 214 acre property. The environmental impacts associated with the plant will not change as a result of this property release. Therefore, the environmental impacts associated with the proposed release of the property are bounded by previously issued environmental impact statements. Based on the above, the NRC determined that preparation of an Environmental Assessment was not required.

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**ADAMS Accession Number: ML16053A257**

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**OFFICIAL RECORD COPY**



Zion Nuclear Power Station, Units 1 and 2 Service List

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SAFETY EVALUATION BY THE OFFICE OF  
NUCLEAR MATERIAL SAFETY AND SAFEGUARDS  
RELATED TO PARTIAL SITE RELEASE REQUEST FOR  
FACILITY OPERATING LICENSE NOS. DPR-39 AND DPR-49  
ZIONSOLUTIONS, LLC.  
ZION NUCLEAR POWER STATION, UNITS 1 AND 2  
DOCKET NOS. 50-295 AND 50-304

1.0 INTRODUCTION

By letter to the U.S. Nuclear Regulatory Commission (NRC) dated August 27, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15243A029), as supplemented by letter dated January 26, 2016 (ADAMS Accession No. ML16028A192), ZionSolutions, LLC (ZS, the licensee) submitted a request to the NRC for approval of a partial site release at Zion Nuclear Power Station (ZNPS), Units 1 and 2. The proposed action would remove and release the portions of the site which have been classified as radiologically non-impacted, from its Part 50 license.

2.0 REGULATORY EVALUATION

Section 50.83, "Release of part of a power reactor facility or site for unrestricted use," in Title 10 of the *Code of Federal Regulations* (10 CFR), establishes the following requirements:

- a. Prior written NRC approval is required to release part of a facility or site for unrestricted use at any time before receiving approval of a license termination plan. Section 50.75 specifies recordkeeping requirements associated with partial release. Nuclear power reactor licensees seeking NRC approval shall:
  1. Evaluate the effect of releasing the property to ensure that –
    - i. The dose to individual members of the public does not exceed the limits and standards of 10 CFR Part 20, Subpart D;
    - ii. There is no reduction in the effectiveness of emergency planning or physical security;
    - iii. Effluent releases remain within license conditions;
    - iv. The environmental monitoring program and off-site dose calculation manual are revised to account for the changes;

- v. The siting criteria of 10 CFR Part 100 continue to be met; and
  - vi. All other applicable statutory and regulatory requirements continue to be met.
2. Perform a Historical Site Assessment of the part of the facility or site to be released; and
  3. Perform surveys adequate to demonstrate compliance with the radiological criteria for unrestricted use specified in 10 CFR 20.1402 for impacted areas.
- b. For release of non-impacted areas, the licensee may submit a written request for NRC approval of the release if a license amendment is not otherwise required. The request submittal must include:
1. The results of the evaluations performed in accordance with paragraphs (a)(1) and (a)(2) of this section;
  2. A description of the part of the facility or site to be released;
  3. The schedule for release of the property;
  4. The results of the evaluations performed in accordance with § 50.59; and
  5. A discussion that provides the reasons for concluding that the environmental impacts associated with the licensee's proposed release of the property will be bounded by appropriate previously issued environmental impact statements.
- c. After receiving an approval request from the licensee for the release of a non-impacted area, the NRC shall:
1. Determine whether the licensee has adequately evaluated the effect of releasing the property as required by paragraph (a)(1) of this section;
  2. Determine whether the licensee's classification of any release areas as non-impacted is adequately justified; and
  3. Upon determining that the licensee's submittal is adequate, inform the licensee in writing that the release is approved.

"Non-impacted area" is defined in 10 CFR 50.2 as "the areas with no reasonable potential for residual radioactivity in excess of natural background or fallout levels."

### 3.0 BACKGROUND

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 permanently shut-down after approximately 23 years of operation. In February 1997, ZNPS Unit 1 was permanently shut-down after approximately 24 years of operation. In early 1998, in accordance with 10 CFR 50.82(a)(1)(i) and (ii), 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 (ADAMS Legacy Accession Nos. 9902200407 and 9803110251). On September 1, 2010, the NRC transferred Facility Operating License Numbers DPR-39 and DPR-48 from Exelon to ZS (ADAMS Accession No. ML102290437). 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.

By letter dated December 19, 2014 (ADAMS Accession No. ML15005A336), and supplemented on February 26, 2015 (ADAMS Accession No. ML15061A281), ZS submitted the License Termination Plan (LTP) for ZNPS in accordance with 10 CFR 50.82(a)(9). The LTP includes a site characterization to ensure that Final Radiation Surveys (FRS) cover all areas where contamination existed, remains, or has the potential to exist or remain; identification of remaining dismantlement activities; plans for site remediation; a description of the FRS plan to confirm that ZNPS will meet the release criteria in 10 CFR part 20, subpart E; dose-modeling scenarios that ensure compliance with the radiological criteria for license termination; an estimate of the remaining site-specific decommissioning costs; and a supplement to the Defueled Safety Analysis Report and the Environmental Report describing any new information or significant environmental change associated with proposed license termination activities. The Zion LTP is currently being reviewed by the NRC.

By letter dated August 27, 2015 (ADAMS Accession No. ML15243A029), as supplemented by letter dated January 26, 2016 (ADAMS Accession No. ML16028A192), ZS submitted a request for approval to remove a portion of the site from the part 50 License Nos. DPR-39 and DPR-48. Specifically, ZS intends to remove and release from its part 50 licenses the portions of the site that the Historical Site Assessment (HSA) characterization process has classified as radiologically non-impacted, in accordance with 10 CFR 50.83(b).

The property that is subject to this release request is an approximately 214-acre parcel of uninhabited, essentially undeveloped land that the licensee states has not been negatively impacted by ZNPS operations or subsequent decommissioning activities. This land is referred to in this document as "the property." Maps of the property are included as enclosures to the licensee's submittal. The 214-acre parcel of land that is subject to this request is sub-divided into eleven (11) survey units.

Non-impacted areas have no reasonable potential for residual contamination because historical information indicates there was no known impact from site operations. The non-impacted areas include the outlying open land areas of the site, as well as contiguous areas that have no impact from site operations based upon the location(s) of licensed operations, site use, topography, site discharge locations, and other site physical characteristics.

#### 4.0 Technical Evaluation

##### 4.1 Licensee's Assessment of the Property to be Released

In accordance with the guidance provided in NUREG-1575, "Multi Agency Radiation Survey and Site Investigation Manual (MARSSIM)", section 3.0, an HSA was performed and documented in August 1999 (ADAMS Accession No. ML15342A281). Historical information, including any 10 CFR 50.75(g) files, employee interviews, radiological incident reports, pre-operational survey data, spill reports, special surveys (e.g., site aerial surveys, marine fauna and sediment surveys), operational survey records, and Annual Radiological Operating Reports (including sampling of air, groundwater, estuary water, milk, invertebrates, fish and surface vegetation) were reviewed and compiled for this investigation.

The HSA was a detailed investigation to collect existing information (from the start of ZS activities related to radioactive materials or other contaminants) for the site and its surroundings. The HSA focused on historical events and routine operational processes that resulted in the contamination of the plant systems, on-site buildings, surface and subsurface soils within the Radiologically Controlled Area (RCA) as well as support structures, open land areas and subsurface soils outside of the RCA, but within the owner controlled area. The information compiled by the HSA was used to establish initial area survey units and classifications and eventually, input into the development of potential site-specific Derived Concentration Guideline Levels (DCGL), development of remediation plans, and the design of the FRS for the LTP. The scope of the HSA included potential contamination from radioactive materials, hazardous materials, and state-regulated materials.

The HSA investigation was designed to obtain sufficient information to provide initial classification of the site land areas and structures as impacted or non-impacted. Impacted areas have a potential for contamination (based on historical data) or contain known contamination (based on past or preliminary radiological surveillance). As stated in section 2.0 above, "Non-impacted area" is defined in 10 CFR 50.2 as "the areas with no reasonable potential for residual radioactivity in excess of natural background or fallout levels."

Based on a review of the operating history of the facility, historical incidents, and operational radiological surveys as documented in the HSA, as well as subsequent characterization surveys discussed in the next section, the licensee deemed the subject open land areas to be not impacted by licensed activities or materials and therefore, the licensee determined that the "non-impacted" classification was appropriate.

The licensee's review indicated that: the land has not been used for plant operations; the land has not been used for storage of any radioactive material or waste; and there are no event records that any spills, leaks, or uncontrolled release of radioactive material have ever occurred on the land, reportable or non-reportable.

The licensee indicated that this property has no reasonable potential for residual radioactivity in excess of natural background or fallout levels, therefore, this property qualifies as a "non-impacted area" as that term is defined in 10 CFR 50.2.

The licensee evaluated the property to be released with respect to the criteria in 10 CFR 50.83(a)(1)(i)-(vi) and made the following declarations:

- i. The dose to individual members of the public does not exceed the limits and standards of 10 CFR Part 20, Subpart D because of the strict control of radioactive effluents, use of radiation monitoring systems within the plant, and the surveillance and analyses performed as part of the Radiological Environmental Monitoring Program (REMP). The release of this property does not change any controls used to comply with dose limits for individual members of the public. ZNPS has determined that the property was never used for any radiological purposes.
- ii. Impact on the effectiveness of emergency planning or physical security has been evaluated. No credit is taken for this land in either the Emergency Plan or Security Plan. Therefore, the release of this property has no adverse effect on either plan.
- iii. Effluent releases remain within license conditions and, because the property is distant from the plant site and is not down-gradient of discharge structures, it does not have the potential to be affected by effluent releases. The plant programs to maintain effluent releases within license conditions remain in effect and the transfer of this property does not impact those programs. Therefore, the effluent releases from ZNPS will remain within license limits.
- iv. The release of this property does not have any effect on the environmental monitoring program and off-site dose calculation manual revisions, and neither requires revision as a result of this property release.
- v. The siting criteria of 10 CFR Part 100 continue to be met. The release of the subject property has been reviewed with respect to the siting criteria in 10 CFR Part 100 and it has been determined that the requirements of 10 CFR Part 100 are either not impacted or are not applicable. ZS will continue to control the exclusion area and maintain the ability to remove members of the public from the exclusion area in the case of a radiological emergency.
- vi. Other statutory and regulatory requirements continue to be met. There are no changes to the ZNPS policies and procedures to ensure that statutory and regulatory requirements continue to be met as a result of this property release.

The licensee concludes that this property release has no impact on ZNPS's continued compliance with applicable NRC regulatory standards.

#### 4.2 NRC Staff Evaluation of the Property to be Released

The NRC staff has reviewed the licensee's application for the release of part of the ZNPS site for unrestricted use. This property totals about 214 acres and is located predominately to the west of the former power plant footprint. The ZNPS site is located in the extreme eastern portion of the City of Zion in Lake County, Illinois on the west shore of Lake Michigan. Although the site encompasses approximately 331 acres, it is relatively isolated as the site is bordered to the north and south by Illinois Beach State Park, a small industrial area followed by railroad tracks to the west and Lake Michigan to the east. The center of the community of Zion is

approximately 1.6 miles from the plant location on the site. There are no schools or hospitals within one mile and there are no residences within 2,000 feet of station structures. Release of this property should not degrade the environment, impact public health, or impact local land uses.

Release of the property will not result in public or environmental exposure to radioactive contamination. There are no known records of any spills, leaks, or uncontrolled release of radioactive material on this parcel of land. The property was not used for any activities that could have contaminated the property. Contaminated groundwater from power plant decommissioning does not occur and could not migrate to the property as the property is up-gradient from the decommissioning power plant.

A historical cultural review was performed during the initial stages of planning and construction of the ZNPS. No historic properties or cultural sites were identified in the area of the property. This assessment was affirmed by the State of Illinois, Department of Conservation, as documented in the Atomic Energy Commission's Final Environmental Statement for ZNPS (ADAMS Accession No. ML15344A360). The release of the property does not involve any disturbance of the ground. Therefore, release of the property will not affect any known historic or cultural sites.

In addition the proposed action will not result in any change to non-radiological plant effluents and thus, will have no impact on either air or water quality. As the proposed action is wholly procedural and administrative in nature, the NRC staff has determined that the proposed action will have no effect on listed species or critical habitat.

No environmental concerns associated with the release of the 214-acre property were identified. The release of the property will not impact on-going decommissioning activities. The environmental impacts associated with the plant will not change as a result of this property transfer. Therefore, the environmental impacts associated with the proposed release of the property are bounded by the previously issued environmental impact statement (i.e., Zion Final Environmental Statement, dated December 1972 (ADAMS Accession No. ML15344A360)).

The NRC staff reviewed the 10 CFR 50.59 evaluation for the partial site release. The NRC finds that the property is not specifically listed in the license or the Technical Specifications (TS); is not within the security fence of the plant; is not needed for execution of the site emergency plan; is not within the exclusion zone; is not located on the lake shoreline; has no effect on plant decommissioning; and the property is classified as a non-impacted area.

The NRC staff has reviewed the licensee's justification for concluding that the property to be released is a non-impacted area as defined in 10 CFR 50.2. Although 10 CFR 50.83(a)(3) only requires the performance of radiological surveys to demonstrate compliance with the radiological criteria for unrestricted use specified in 10 CFR 20.1402 **for impacted areas** (emphasis added), the licensee conducted surveys of the property consistent with the LTP. The characterization survey was designed and executed using the guidance provided in MARSSIM and NUREG-1757, Volume 2, Revision 1, "Consolidated Decommissioning Guidance-Characterization, Survey, and Determination of Radiological Criteria, Final Report." Areas classified as non-impacted received surveys developed to include a combination of systematic and biased survey measurement locations and scan areas. Within each of the survey units specified, the survey focused primarily on surface (0 to 15 cm) soils. Subsurface (15 to 100 cm)

soil samples were included in the survey design only if the analysis of surface soil samples indicated the presence of detectable plant-derived radioactivity. The sample and static measurement locations were based on a random design to ensure an unbiased survey. The characterization survey of each survey unit consisted of both qualitative evaluations and quantitative analysis results. The qualitative evaluation consisted of static measurements using a Canberra *In Situ* Object Counting System (ISOCS). Quantitative analysis results were obtained from radionuclide specific analysis of surface soil media using a calibrated counting geometry. Based upon the results of the characterization surveys performed of the non-impacted open land areas, the licensee concluded that a non-impacted classification for these areas was appropriate. Cesium-137 (Cs-137) was the only radionuclide positively identified that could potentially be classified as facility generated. However, the concentrations observed were well within the range of activity defined as background due to global fallout.

The NRC staff reviewed the licensee's basis for designating certain site areas as non-impacted and submitted a Request for Additional Information (RAI) via a November 3, 2015 letter (ADAMS Accession Number ML15306A101). The staff notes that those RAIs were previously developed for the LTP and address both impacted and non-impacted areas. For the purpose of determining the adequacy of characterization for this partial site release, only the results for non-impacted areas were evaluated by the staff.

Based on the NRC staff's initial review, clarification was needed on the basis for Cs-137 global fallout values utilized at the site and on the appropriateness of characterization surveys used to support partial site release. The licensee responded to the NRC RAIs via a January 26, 2016, letter (ADAMS Accession Number ML16028A192).

The licensee's RAI responses addressed NRC staff concerns that fallout data from sites in Massachusetts, New York and Pennsylvania were utilized to develop investigation levels for characterization surveys. The licensee also provided as part of the RAI response, ZS Technical Support Document (TSD) 13-004 "Examination of Cs-137 Global Fallout in Soils at Zion Station," and LTP Reference 2-21, "Determination of Radionuclide Activity Concentrations in Soils in Non-Impacted Soils Adjacent to the Zion Nuclear Station." Within these responses, it was noted that the licensee's initial finding was that the soil data combined from TSD 13-004 and LTP Reference 2-21 only represented soil from an area that was categorized as "disturbed non-drainage," and that other soil types such as "disturbed drainage" or "undisturbed drainage" are known through literature to contain higher Cs-137 background concentrations from fallout than "disturbed non-drainage" soils. As such, the licensee utilized data from the study "Investigations of Natural Variations of Cesium-137 Concentrations in Residential Soils" (prepared for the Health Physics Society 39<sup>th</sup> Annual Meeting in June 1994) to address the four potential soil types expected at Zion: disturbed non-drainage; disturbed drainage; undisturbed non-drainage; and undisturbed drainage. The licensee's response further notes that Zion is within the same atmospheric fallout region as those included in the 1994 "Investigations of Natural Variations of Cesium-137 Concentrations in Residential Soils" study, and concludes that the soil data in this report from Massachusetts, New York, and Pennsylvania are representative of soils in the Zion area.

The licensee's RAI responses also clarified the manner in which characterization investigation levels were related to fallout data and how areas were determined to be non-impacted. Both qualitative evaluations (static ISOCS measurements and gamma scans) and quantitative analyses (radionuclide specific analysis of surface soil media using a calibrated counting

geometry) were performed during characterization. The ISOCS Minimum Detectable Concentration (MDC) and gamma scanning sensitivities were estimated based on the assumed geometry and plant-derived gamma-emitting radionuclides that could hypothetically be present. The ISOCS analysis times were set to achieve the most limiting MDCs for expected soil types assuming Cs-137 background due to global fallout, as set forth in TSD 13-004 (i.e., the maximum measured range value for disturbed non-drainage soils,  $3.40\text{E-}01$  pCi/g). Investigation levels were set to the maximum value of the measured range for each of the four soil categories (per the 1994 "Investigations of Natural Variations of Cesium-137 Concentrations in Residential Soils" study). Any exceedance of those values would result in additional investigations of soils, and if an ISOCS or surface soil measurement exceeded the upper 95 percent confidence level for a given soil type, the area would be reclassified as impacted. The licensee's RAI responses indicated that no measurement taken in any non-impacted survey unit exceeded the upper value for the measured range from the fallout study for all soil types, and also noted that no measurement/sample result taken in any non-impacted survey unit exceeded the upper 95<sup>th</sup> confidence level for Cs-137 for their respective soil category, and that no survey unit required reclassification to "impacted." Additionally, the licensee evaluated whether initial classifications would change if actual site data were used instead of global fallout data. The licensee evaluated characterization results in light of actual site background data and indicated that of the 402 total measurements/samples taken in the non-impacted survey units, no measurement of Cs-137 exceeded the maximum observed measurement of Cs-137 ( $6.51\text{E-}01$  pCi/g) detected in the Zion background data, and that less than 3 percent of the results exceeded the upper 95 percent confidence level for the actual Zion site data set. The licensee proposes that no changes in classification are warranted.

The NRC staff recognizes the potential for fluctuations in radiological fallout retention depending on soil type, and finds the present usage of global fallout data (to determine an investigation level for non-impacted areas) to be acceptable based upon the licensee's analysis that the site lies in the same atmospheric fallout region as the global areas analyzed. However, the NRC staff notes that the usage of global fallout data is not necessarily applicable to background subtractions, or to background reference areas, for use during future decommissioning of impacted areas of the site.

Through its RAIs, the NRC staff also expressed concerns that Hard-to-Detect (HTD) radionuclides were only evaluated when an elevated direct gamma measurement was encountered during characterization and noted that it appears that no HTD measurements were performed in non-impacted areas. The RAIs further enquired about how radionuclides other than Cs-137 and Cobalt-60 (Co-60) would be positively identified in both non-impacted and impacted areas and asked the licensee to provide a justification for considering areas to be non-impacted, when it appears that HTD radionuclides may not have been considered in those areas. In response to these questions, the licensee indicated that "of the 402 measurement/samples taken, Cs-137 was positively detected through gamma spectroscopy in 181 samples with a maximum observed concentration of  $5.70\text{E-}01$  pCi/g," and that "no other plant-derived gamma-emitting radionuclides (i.e. Co-60) were detected at concentrations greater than the instrument MDC in any of these samples." The licensee's responses noted that an HTD analysis was performed on 9 soil samples from a Class 1 (impacted) survey unit during characterization (taken from samples with the highest Cs-137 results), and no plant-derived radionuclides, including HTD radionuclides, other than Co-60 and Cs-137, were detected by this analysis. The licensee further "contends that there is no reasonable or plausible scenario at Zion where a HTD Radionuclide of Concern (ROC) would be present without the presence of a

plant-derived gamma emitting ROC,” and that the licensee “does not believe that it is technically justified or necessary to analyze samples from non-impacted areas for HTD radionuclides when no detectable plant-derived gamma emitting ROC were identified above background levels.”

The NRC staff recognizes that it may not be technically justified or necessary to analyze samples from non-impacted areas for HTD radionuclides when no detectable plant-derived gamma emitting ROC were identified above background levels, as is the case presented for the licensee’s characterization surveys for non-impacted areas. However, the NRC staff notes that for the purpose of Final Status Surveys (FSS) of impacted areas, the licensee must adequately justify the methods used to address HTD radionuclides. As such, a basis for the licensee’s assertion that “there is no reasonable or plausible scenario at Zion where a HTD ROC would be present without the presence of a plant-derived gamma emitting ROC” should be provided for future FSS of impacted areas at the site.

In order to confirm the licensee’s radiological surveys, the NRC staff contracted for the Oak Ridge Associated Universities (ORAU) to conduct confirmatory surveys of the non-impacted open land areas. ORAU conducted their radiological surveys and sampling July 6-9, 2015, and provided the final report of their survey on December 23, 2015, (ADAMS Accession Number ML16053A304). The survey activities included visual inspections, gamma and beta radiation surface scans, gamma and beta radiation measurements, and soil and miscellaneous sampling. The majority of gamma surface scans and total surface activity measurements were not distinguishable from background. Six of the seven surface soil samples collected from the non-impacted land areas contained Cs-137 concentrations above the analytical minimum detectable concentrations but were also well below the Cs-137 release criterion; low concentrations of Cs-137 are expected in background samples. Several soil samples were analyzed for Sr-90, and all results were below the Sr-90 release criterion and the analytical MDCs. These survey results confirm the licensee’s classification of the areas as non-impacted. Based on the licensee’s environmental assessment of the property and the ORAU confirmatory surveys, the NRC staff concludes the property has no reasonable potential for residual radioactivity in excess of natural background or fallout levels.

The NRC staff review notes that survey results for non-impacted areas were below the established Cs-137 investigation levels and were at a fraction of the Cs-137 soil DCGL presented in the LTP. Additionally, no other plant-derived gamma emitters (such as Co-60) were identified during characterization surveys of non-impacted areas. As such, the NRC staff concludes the property meets the definition of a non-impacted area in accordance with 10 CFR 50.2.

Based on the property being a non-impacted area, the NRC staff reviewed the requirements in 10 CFR 50.83(c)(1) and (2) for releasing non-impacted areas for unrestricted use and determined that the licensee’s submittal, as listed in Section 4.1, has sufficiently addressed the requirements as follows:

- i. 10 CFR 50.83(a)(1)(i) - Ensure that the dose to individual members of the public does not exceed the limits and standards of 10 CFR Part 20, Subpart D. The licensee continues to be required to implement a radiation protection program commensurate with 10 CFR Part 20 and ZNPS Technical Specifications 5.6.2 and 5.6.3. The NRC finds that the licensee’s surveillance and analyses conducted as part of their REMP provides sufficient information to conclude that the doses to members of the public on the

property are currently within 10 CFR Part 20, Subpart D, and are expected to remain within 10 CFR Part 20, Subpart D, following the property release. The NRC staff concludes that additional assurance is provided by the licensee's radiation monitoring systems and the fact that no licensed activities were ever conducted on this property.

- ii. 10 CFR 50.83(a)(1)(ii) - Ensure that there is no reduction in the effectiveness of emergency planning or physical security. This is addressed in the licensee's request in that it evaluated the release of the property and no credit is taken for the land by the licensee in its emergency plan or physical security plan. The NRC staff verified that there are no off-site emergency plan facilities on this property. The NRC staff concludes that the release of the land will not reduce the effectiveness of the emergency plan or physical security.
- iii. 10 CFR 50.83(a)(1)(iii) - Ensure effluent releases remain within the license conditions. The NRC has evaluated the release of the property and finds that a decommissioning facility has negligible potential for effluent releases. After the release, the use of the property by members of the public will not create new pathways of exposure that would cause radioactive releases from the site to exceed license conditions. The NRC finds sufficient information in the licensee's submittal to conclude that the licensee's site programs, which maintain effluent releases from ZNPS within license conditions, will remain in effect and this release of property does not impact those programs. Therefore, the NRC concludes the release of this land will not impact the licensee's ability to maintain effluent releases from ZNPS within license conditions.
- iv. 10 CFR 50.83(a)(1)(iv) - Ensure the environmental monitoring program and off-site dose calculation manual are revised to account for the change. The licensee states that the owner-controlled boundary will remain the same and therefore, the Environmental Monitoring Program, off-site Dose Calculation Manual (ODCM) and supporting documents are still valid and no changes are needed. The NRC recognizes a radiological exposure pathway as the vehicle by which the public may become exposed to radioactivity released from nuclear facilities. The major pathways of concern are those that could cause the highest calculated radiation dose. These pathways are determined from the type and amount of radioactive material released, the environmental transport mechanism, and how the plant environs are used (e.g., residence, gardens, etc.). A permanently shutdown and decommissioning facility no longer has high energy systems which present the possibility of a release with sufficient energy for transport beyond the owner controlled boundary. The NRC finds that the release of this land will not impact the owner-controlled boundary or the potential for a release beyond that boundary. As a result, the NRC concludes the release of the land has no effect on the environmental monitoring program, the off-site dose calculation manual, or the established plant programs used to maintain effluent releases within license conditions. Therefore, the NRC concludes the current Environmental Monitoring Program and ODCM are not impacted by the release of this land, and no changes to the Environmental Monitoring Program, or the ODCM would be required by the release of this land.
- v. 10 CFR 50.83(a)(1)(v) - Ensure the siting criteria of 10 CFR Part 100 continue to be met. The licensee states that the siting criteria of 10 CFR Part 100 continue to be met. The release of the subject property has been reviewed with respect to the siting criteria in 10



CFR Part 100 and it has been determined that the requirements of 10 CFR Part 100 are either not impacted or are not applicable. ZS will continue to control the exclusion area and maintain the ability to remove members of the public from the exclusion area in the case of a radiological emergency. The NRC has separately reviewed the 10 CFR Part 100 siting criteria and agrees with the licensee's conclusion.

- vi. 10 CFR 50.83(a)(1)(vi) - Ensure that all other applicable statutory and regulatory requirements continue to be met. This is addressed by item (vi) in the licensee's request that states other statutory and regulatory requirements continue to be met because there are no changes to ZNPS' policies and procedures. The NRC staff concludes that the release of the property has no adverse effect on the licensee's compliance with all other statutory and regulatory requirements.

Based on the NRC staff evaluation of the items in (i) through (vi) above, the NRC concludes the requirements of 10 CFR 50.83(c)(1) are satisfied.

The requirements in 10 CFR 50.83(c)(2) are addressed by the licensee as listed in Section 4.1 of this Safety Evaluation (SE), and the NRC's assessment is as follows:

- i. 10 CFR 50.83(c)(2) - After receiving an approval request from the licensee for the release of a non-impacted area, the NRC shall determine whether the licensee's classification of any release areas as non-impacted is adequately justified. The NRC (in 10 CFR 50.2) defines non-impacted areas as "areas with no reasonable potential for residual radioactivity in excess of natural background or fallout levels." The NRC (in 10 CFR 20.1003) defines residual radioactivity as "radioactivity in structures, materials, soils, groundwater, and other media at a site resulting from activities under the licensee's control. This includes radioactivity from all licensed and unlicensed sources used by the licensee, but excludes background radiation. It also includes radioactive materials remaining at the site as a result of routine or accidental releases of radioactive material at the site and previous burials at the site, even if those burials were made in accordance with the provisions of 10 CFR Part 20." As noted above, the NRC reviewed the licensee's HSA and radiological surveys and determined that they adequately supported the licensee's conclusion the area to be released was non-impacted.

Based on the historical site assessment performed by the licensee, the surveys performed by the licensee, and the confirmatory surveys performed by the NRC contractor, the NRC finds that the requirement in 10 CFR 50.83(c)(2) is met.

Based on the above considerations, the NRC staff concludes that the licensee has adequately met the requirements in 10 CFR 50.83(c)(1) and (2) for releasing non-impacted areas for unrestricted use.

## 5.0 CONCLUSION

The licensee requested approval for the release of the land described in the licensee's submittal and Section 3.0 of this Safety Evaluation, which is currently part of the ZNPS, Unit Nos. 1 and 2, site for unrestricted use. Based on the NRC staff evaluation of this partial site release application, the NRC staff concludes that the licensee's submittal has adequately:

1. Assessed the property to be released;
2. Evaluated the effect of releasing the property;
3. Justified the property is a non-impacted area and no amendment to the license is needed; and
4. Addressed the effect of releasing the property for unrestricted use.

The NRC staff concludes that, the licensee's request meets the requirements in 10 CFR 50.83 and: (1) there is reasonable assurance that the health and safety of the public will not be endangered; and (2) the release will not be inimical to the common defense and security or to the health and safety of the public.

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Date: March 31, 2016

PUBLIC COMMENTS RELATED TO  
PARTIAL SITE RELEASE REQUEST FOR  
FACILITY OPERATING LICENSE NOS. DPR-39 AND DPR-48  
ZIONSOLUTIONS, LLC.  
ZION NUCLEAR POWER STATION, UNIT NOS. 1 AND 2  
DOCKET NOS. 50-295 AND 50-304

This section presents a list of the comments received on the requested partial site release, and the NRC's response to the comments. The NRC held a public meeting near the Zion Nuclear Power Station (ZNPS) on December 1, 2015. The NRC received several comments from the members of the public in attendance. Additionally, the Illinois Dunesland Preservation Society (IDPS), submitted comments by letter dated December 22, 2015 (ADAMS Accession No. ML16029A263).

The comments and NRC responses to the issues raised are as follows.

1. Environmental Impacts

**Comment:** Commenters questioned the environmental impacts of the proposed partial site release.

**NRC Response:** The licensee's request identified the environmental impacts as required by regulation. The NRC reviewed and evaluated the environmental impacts as documented in the Safety Evaluation. The NRC determined that environmental impacts associated with the plant will not change as a result of this property transfer. Therefore, the environmental impacts associated with the proposed release of the property are bounded by previously issued environmental impact statements.

2. Security Plan Impacts

**Comment:** Commenters questioned the impact of the proposed partial site release on the licensee's security plan.

**NRC Response:** The licensee's request addressed the impact of the proposed partial site release on the security plan as required by regulation. The NRC reviewed and evaluated the security plan impacts as documented in the Safety Evaluation. The NRC determined that the release of the land will not reduce the effectiveness of the licensee's physical security plan.

3. ISFSI and Spent Fuel Pool Safety

**Comment:** Commenters expressed general concerns with the safety of the spent fuel in the Independent Spent Fuel Storage Installation (ISFSI) and the potential need to retain the spent fuel pool. Additionally, in their letter, the IDPS specifically requested that a “Hardened On-site Storage” system be used in lieu of the current storage modules and that the Department of Homeland Security review the storage system with the technical assistance of non-NRC engineering expertise. The IDPS also stated that “the computer model testing of the modules is grossly insufficient and the *in situ* physical testing and its depth of study is also lacking and insufficient.”

**NRC Response:** The NRC staff finds these comments to be beyond the scope of this proposed partial site release because the proposed release of the non-impacted land does not impact the storage of spent fuel at the ISFSI.

4. Private Property

**Comment:** A commenter questioned the posting of private property signage on the licensee’s property adjacent to the adjoining state park property.

**NRC Response:** The proposed partial site release has no impact on the ownership of the property or how the owner may post on their property.

5. State Interface

**Comment:** A commenter questioned the interface between the NRC and the State regulatory authority.

**NRC Response:** No specific coordination is required by NRC regulations for the proposed action. The Illinois Department of Nuclear Safety (IDNS) was aware of the requested partial site release and was present at the public meeting and acknowledged their attendance. In general, the NRC and the IDNS communicate regularly on the oversight of the decommissioning of the ZNPS. A Memorandum of Understanding is in place to document the agreement between the NRC and the IDNS.

6. Circulating Water Pipes Extending Into Lake Michigan

**Comment:** The IDPS provided multiple comments related to the ZNPS circulating water pipes including:

- This [the pipes] is considered a coastal structure and apparently has caused significant, negative impact to the park’s southern shoreland and should be removed.
- The piping/structure extending into Lake Michigan is an apparent violation of an Army Corps of Engineers’ permit.
- The piping and NPDES permit are under the jurisdiction of the Illinois Environmental Protection Agency, which appears to be in violation.

- The pipes are privately owned and are in apparent violation of the Public Trust Doctrine of the State of Illinois since it is no longer a nuclear power station.
- The pipes should be removed immediately because it is privately owned.
- Exelon and Commonwealth Edison and all the other entities involved in operating/demolishing the power station and its deregulation have a responsibility to repair the damage that was apparently created by the power station pipes.

**NRC Response:** The NRC staff finds these comments to be beyond the scope of this proposed partial site release because the proposed partial site release does not involve and has no impact on the ZNPS circulating water pipes. Separately, as part of any eventual license termination for the ZNPS, the NRC will ensure that that any portion of the facility which remains meets the termination criteria in 10 CFR Part 20. With respect to recommended removal of the pipes and the oversight by the Army Corps of Engineers and the Illinois Environmental Protection Agency, these issues do not fall under the regulatory authority of the NRC.

#### 7. Critical Habitat for the Piping Plover

**Comment:** The IDPS stated that the park's entire shoreline is a federal, critical habitat for the piping plover and that much of this habitat has been destroyed in an apparent violation of the regulations and statutes of the U.S. Fish and Wildlife Service. The IDPS also stated that the Illinois Beach State Park is under the U.S. Department of Interior's National Natural Landmarks program (NNL), which has regulations and statutes for protecting this type of habitat.

**NRC Response:** The NRC staff finds these comments to be beyond the scope of this proposed partial site release because the proposed partial site release does not involve and has no impact on the shoreline or the Illinois Beach State Park. Nevertheless, the NRC notes that ZNPS has a program for the protection of threatened or endangered species (ADAMS Accession No. ML15005A331). With regard to the U. S. Department of Interior's NNL oversight of the Illinois Beach Nature Preserve portion of the Illinois Beach State Park, the NRC has no authority over or specific coordination with the NLL.

#### 8. Native American Archaeological Sites

**Comment:** The IDPS stated that the park has scores of ancient, Native American archaeological sites, which fall under federal jurisdiction.

**NRC Response:** The NRC staff finds these comments to be beyond the scope of this proposed partial site release because the proposed partial site release does not involve the disturbance of any of the property at the Illinois Beach State Park. The NRC has no jurisdiction with respect to any of the property at the Illinois Beach State Park.

#### 9. Transfer Ownership of the Property to the State of Illinois

**Comment:** The IDPS stated that the property that is available should be given to the State of Illinois for Illinois Beach State Park to form a complete nature preserve, connecting the north and south units of the park.

**NRC Response:** The NRC staff finds these comments to be beyond the scope of this proposed partial site release because the NRC's responsibility related to the partial site release is limited to determining whether or not the unrestricted release of the property poses a radiological risk to public health and safety. Any determination of subsequent use of the property is outside NRC authority.

10. NRC Jurisdiction

**Comment:** The IDPS stated that the NRC should take jurisdiction and act on the issues they have raised prior to taking any other actions on this matter.

**NRC Response:** The NRC's jurisdiction over the issues raised by the IDPS is addressed in each NRC response to an IDPS comment above.