

Post-Closure Program Streamlining at the Nevada National Security Site – 15290

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ABSTRACT

More than 200 sites on the Nevada National Security Site (NNSS), Nevada Test and Training Range (NTTR), and Tonopah Test Range (TTR) have been closed in place. At these sites, contamination has been left in place, and protection of human health, safety, and the environment is ensured through the establishment of use restrictions (URs). Post-closure requirements were initially established in the Closure Report (CR) for each site and include a variety of inspection, monitoring, maintenance, and reporting commitments. Post-closure requirements and site controls (fences, monuments, soil covers, and postings) may vary depending on site location, accessibility, land use scenario, and the nature of contaminants left in place.

Corrective Action Sites (CASs) on the NNSS, NTTR, and TTR have been identified for closure under the *Federal Facility Agreement and Consent Order* (FFACO), which was signed in 1996. Over 1,900 CASs have been closed under the framework of the FFACO, and more than 200 of those have URs. Many post-closure requirements have been modified over time. In addition, because the scope of the program has spanned almost 20 years, the post-closure requirements have varied due to changing strategies and expectations. Because of the number of sites closed over the course of the program, post-closure requirements are found in hundreds of closure documents, addendums, errata sheets, Records of Technical Change, inspection reports, permit modifications, and correspondence. Furthermore, resources such as personnel and funding necessary to conduct the post-closure program have diminished, while computer capabilities and configuration control principles have improved since closure activities under the FFACO began. Because of these factors, to effectively manage the post-closure program, ensure that all commitments are being met, and improve the ease of identifying the most current post-closure requirements for each UR, the current requirements for every use-restricted site under the purview of the U.S. Department of Energy, National Nuclear Security Administration Nevada Field Office will be consolidated into a single Post-Closure Plan.

The Consolidated Post-Closure Plan will also outline a strategy and present possible criteria that may be used for future evaluation of post-closure requirements. Continual assessment of the post-closure program will ensure that the post-closure requirements for URs across the NNSS, NTTR, and TTR are consistently justifiable and sufficient to protect site workers, the public, and the environment while increasing efficiency. Future changes to post-closure requirements and justification for those changes will be recorded in revisions to the Consolidated Post-Closure Plan. This process will provide a comprehensive, consistent, and streamlined method for evaluation of post-closure requirements and implementation of changes.

INTRODUCTION

At Corrective Action Sites (CASs) closed under the *Federal Facility Agreement and Consent Order* (FFACO) [1] where contamination has been left in place, protection of human health, safety, and the environment is ensured through the establishment of use restrictions (URs). URs have been implemented at more than 200 sites on the Nevada National Security Site (NNSS), Nevada Test and Training Range

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(NTTR), and Tonopah Test Range (TTR) since the FFACO was signed in 1996. Post-closure requirements were initially established in the Closure Report (CR) for each site and include a variety of inspection, monitoring, maintenance, and reporting commitments. Other protective measures (e.g., fences, monuments, soil covers, and postings) have been implemented as part of FFACO closure at many sites. Site controls and post-closure requirements may vary depending on the nature of contaminants left in place, site location, accessibility, and land use scenario. The strategy and approach toward closure and closure standards have also evolved over the life of the FFACO, necessitating revision to the post-closure requirements in some cases.

For many URs, the post-closure requirements were modified after the CRs were approved. In addition, because the scope of the program has spanned almost 20 years, the post-closure requirements have varied due to changing strategies and expectations. For this reason, various changes to original post-closure requirements can be found in addendums, errata sheets, Records of Technical Change, inspection reports, permit modifications, and letters.

To improve effective and efficient management of the post-closure program and to make it easier to ensure that all commitments are being met, the current requirements should be obtainable from a single source. After the requirements are consolidated, a strategy and means for evaluating and modifying requirements should be standardized. As more URs are established in the future, the need for a comprehensive and consistent approach for managing the program will increase.

A Consolidated Post-Closure Plan will present the current post-closure requirements that are located in hundreds of closure documents, addendums, inspection reports, letters, and other sources. Every use-restricted site (whether inspected or not) under the purview of the U.S. Department of Energy, National Nuclear Security Administration Nevada Field Office (NNSA/NFO) will be included in the plan with the current post-closure requirements and the basis for those requirements.

The Consolidated Post-Closure Plan will also outline a strategy and present possible criteria that may be used for future evaluation of post-closure requirements. Continual assessment of the post-closure program will ensure protection of human health, safety, and the environment is maintained while increasing efficiency. Evaluation of the post-closure program will ensure that the requirements for URs across the NNSA, NTTR, and TTR are consistently justifiable and sufficient to protect site workers, the public, and the environment.

As the strategy presented in the Consolidated Post-Closure Plan is used to evaluate post-closure requirements, changes to the post-closure program may be recommended. Typical changes may include addition or deletion of URs or changes to inspection requirements, physical controls, or report formats. Changes to requirements and justification for those changes will be recorded in revisions to the plan. This will provide a comprehensive, consistent, and streamlined method for evaluation of post-closure requirements and implementation of changes.

The requirements in the Consolidated Post-Closure Plan, as approved, will supersede all previously documented post-closure requirements. The document will serve as the single platform for documenting and modifying requirements, eliminating the uncertainty associated with obtaining requirements from multiple sources, increasing effective management of the program, and ensuring that all commitments are being met.

The Consolidated Post-Closure Plan will be implemented under the assumption that the NNSA and outlying sites will remain under the purview of the U.S. Department of Energy for the foreseeable future;

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the NNSS is an active site, and the DOE has no plans to relinquish the land. The plan will also be developed assuming that regulatory control of the sites remains static. It will not be a permanent long-term stewardship plan; it will clarify requirements and identify other information to effectively manage the sites until regulatory requirements are met or management of the NNSS changes.

IMPLEMENTATION OF THE CONSOLIDATED POST-CLOSURE PLAN

The goal of the post-closure program is to manage sites where contamination has been closed in place with URs and protect site workers and the public from inadvertent exposure. This goal is achieved through signage and other physical controls, inspections and monitoring, and a real estate management program. The Consolidated Post-Closure Plan will document the requirements for every use-restricted site located on the NNSS, NTTR, and TTR and under the purview of NNSA/NFO. Future post-closure activities and reporting will be performed in accordance with the requirements outlined in the approved plan. Revision 0 of the plan will include the current requirements with no changes. As changes to the requirements are recommended, such as addition or deletion of URs or modifications to physical site controls or inspection requirements, the plan will be revised. Revisions to the plan will highlight recommended changes and the justification for the modifications. The plan and any revisions will be submitted for approval to the Nevada Division of Environmental Protection. When approved, the requirements in the current revision of the plan will supersede all previously documented post-closure requirements.

Revisions to the plan will generally be prepared annually, but could be prepared more frequently as needed. Over time, revisions may be made several years apart on an as-needed basis. Addendums or Records of Technical Change to the CRs for the sites with modified requirements will not be required because the current revision of the plan will supersede all previous requirements. Ultimately, the plan will be readily transitioned into a long-term stewardship program when one is implemented in the future.

STRATEGY FOR EVALUATION OF POST-CLOSURE REQUIREMENTS

The Consolidated Post-Closure Plan will present a comprehensive, consistent, and streamlined strategy for continual evaluation and improvement of post-closure requirements and management of URs. The following sections outline examples of evaluation criteria and modifications. Other criteria not included in these sections may be used to evaluate and modify post-closure requirements. Evaluation of requirements should consider the level of risk at each site to determine if changes are recommended.

Consolidation of Inspections and Inspection Documentation

Sites where multiple sites are located immediately adjacent to each other or on overlapping areas can be evaluated to determine whether they can be inspected simultaneously and whether the inspection results can be documented on a single, combined inspection checklist. This would reduce the time required to perform inspections and complete individual checklists for each site.

Streamlining of Inspection Requirements

Inspection requirements can be evaluated and may be modified at some sites due to the location of the sites, level of risk to site workers and the public due to the nature of contamination closed in place, or degree of accessibility of the sites. In addition, post-closure requirements were implemented individually over many years of an evolving process. This may have led to differences between sites that will be evaluated and adjusted as necessary by re-assessing the requirements for all sites against the criteria

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established in the Consolidated Post-Closure Plan. Modification of requirements based on an evaluation of these criteria must ensure that regulatory compliance and protection of site workers, the public, and the environment are maintained.

At sites that are not located near high-traffic areas and where there are no nearby facilities or operations, inspection requirements can be adjusted according to the level of risk. In addition, some large, remote sites are posted with UR signs around the entire perimeter of the site and there is only one practical access point. Some large, remote sites are rarely visited other than for post-closure inspections and confirmation of radiological postings. At some sites, an unmaintained access road is the only practical route to the site.

Rather than inspecting the entire perimeter of these sites every year, the inspection requirement could be changed to include an inspection of the full perimeter every five years and annual verification that only the signs at the access points or along access roads are intact in the intervening years. Evaluation of this factor would involve periodic reassessment of nearby operations to confirm whether any new activities near the sites would affect the determination of risk that led to a modification of requirements.

Some sites have controlled access with locked gates that are maintained by the facility owner, and several CASs may be located within the same access-controlled areas. Based on the level of risk, at sites that are located within the fenced boundaries of access-controlled facilities, the inspection requirement could be modified to verify that the gate is secure and the perimeter fence is intact without entering the fenced area to verify the condition of each individual site. Some sites that fall into this category have UR signs on the perimeter fence. At other sites, signs could be installed on the perimeter fence. At some sites, several individual CASs are located beyond a single access point with a locked gate and a single large UR sign.

Access to these sites requires permission from the facility owner, and a key to the gate must be obtained. At these sites, the inspection requirements could be modified to inspect the individual CASs beyond the gate every five years and inspect only the gate and large UR sign annually in the intervening years. Management and protection of secured sites such as these will be ensured through the real estate management program. Because access is arranged through the facility owner and the sites are located within access-controlled facilities or behind locked gates, this reduces the risk of activities taking place in these areas without authorization. Protection of site workers, the public, and the environment can be maintained in this manner.

The level of risk to site workers and the public due to the nature of contamination closed in place may be used as a factor to determine whether inspections and maintenance requirements may be reduced. If the risk of exposure to contamination to site workers and the public is very low, or if contamination is highly inaccessible at a given site, the site may be a candidate for reduction in the frequency of inspections.

Sites that have required little, if any, repairs or maintenance over time and where the controls have proven to be adequate can be evaluated to determine if the inspection frequency can be reduced. Additionally, the level of detail in the inspections may be adjusted. For example, a full formal inspection may be performed every five years, and the intervening annual inspections may be either cursory or eliminated.

Sites that are use restricted for radiological contaminants and where the UR coincides with radiological postings can be evaluated for modification of the inspection requirements. Sites that are also posted radiological areas have an additional level of protection that may warrant less stringent post-closure requirements. The risk of exposure to contamination at sites that are also posted radiological areas is low because radiological access requirements are sufficient to control the hazards. Therefore, the risk of personnel conducting activities in these areas without proper controls is much lower than the risk at sites

that are not located in posted radiological areas. Inspection frequency may be reduced at some of these sites or combined with the periodic inspections performed by the Radiological Control (RadCon) group. For example, sites that are posted as Contamination Areas are inspected by RadCon every two years, and an inspection of the UR signs may be integrated into these RadCon inspections [2]. In some cases, a full formal inspection may be performed every five years rather than annually, using the intervening RadCon inspections as data points. Additionally, post-closure requirements or UR boundaries may be re-evaluated and modified if there is an indication that the radiological constituents have decayed sufficiently or have migrated outside the original UR boundaries.

Modification of Maintenance and Repair Requirements

Over time, maintenance trends have been observed at some sites that could be rectified either by modifying the site controls or by targeting maintenance requirements based on what is necessary to control impact to the site. The evaluation based on maintenance trends may result in decreased effort for some sites. At other sites, the evaluation may indicate additional inspection or maintenance needs.

The configuration of site controls at some sites leads to frequent maintenance and repairs. These sites can be evaluated for changes that could reduce the frequency of maintenance and repairs. Some of these changes may result in a different configuration of site controls that could greatly reduce long-term maintenance and repair efforts. For example, in areas where high winds cause frequent sign damage, the signs may be placed in a more stable configuration. At some sites, signs mounted on posts could be removed, and smaller signs could be placed on new or existing concrete monuments.

Conversely, evaluation of maintenance and repair trends may identify features that should be inspected that were not originally required. For example, some sites were not required to have warning signs installed at closure; however, they may be located in high-traffic areas and may require additional protection. Also, if a maintenance trend is observed that indicates that a negative impact is being caused by natural elements such as precipitation or wind, site improvements not originally mandated by site closure may be warranted to prevent future impact. For example, intense storms causing erosion damage to soil covers and adjacent areas may warrant construction of additional erosion control features.

The frequency of maintenance and repairs can be weighed against the urgency of performing the repairs or the risk of not performing the repairs immediately. This could result in routine repairs not being performed within the time required if they do not adversely affect the management and control of the site. At some sites, a threshold could be proposed to determine when repairs are needed. For example, if there are numerous or closely spaced signs at a site, there may not be an immediate need to repair or replace signs until a certain percentage of the total are damaged or missing. In addition, signs may not be repaired or replaced unless adjacent signs are not visible within a certain distance or unless the signs at the logical access points require repair.

At some sites, post-closure requirements may include maintenance of features that are non-essential to the effective management and control of the site. If features meeting this definition are identified, they may be excluded from future inspection and maintenance requirements. For example, some sites have legacy fencing that was not part of the closure but is included in the inspection routine. If the fence is not adding value to the management of the site, it may not require inspection and maintenance and could be evaluated for removal.

Consolidation and Streamlining of Reporting Requirements and Documentation

Inspection checklists can be evaluated for modification to improve efficiency. Examples of modifications include combining co-located sites onto single checklists, adding or removing checklist items to better reflect the information needed for effective management, modifying the layout of the checklists, and evaluating if continuing to include all completed checklists in the final report is necessary.

The format and content of the inspection reports can be evaluated. For example, an annual report is currently submitted that has detail for each CAS and includes every issue noted and all maintenance performed. The report could be reorganized with a tabular list of sites that were inspected and routine maintenance that was performed. Only sites with non-routine issues such as erosion requiring repair may be discussed in the text of the report. Rather than including a written section for each CAS, the report could note in the summary that all routine maintenance was performed as required.

CONCLUSIONS

Establishing a streamlined approach for continual evaluation and effective management of the post-closure program will increase efficiency and simplify administration of the sites. An approved strategy for recurrent evaluation and improvement, combined with the documentation of all of the post-closure requirements in a single plan will ensure the program is effectively and efficiently managed in the future.

REFERENCES

1. *Federal Facility Agreement and Consent Order*, 1996 (as amended). Agreed to by the State of Nevada; U.S. Department of Energy, Environmental Management; U.S. Department of Defense; and U.S. Department of Energy, Legacy Management.
2. Radiological Control Managers' Council, 2012. *Nevada National Security Site Radiological Control Manual*, DOE/NV/25946--801 Revision 2. March 2012. Las Vegas, NV.

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