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Environmental Assessment for Proposed  
NRC License No. SUB-(TBD)  
R.M.D. Operations, LLC

Performance-Based, Multisite License  
for a Uranium Water Treatment Program

Final Report

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U.S. Nuclear Regulatory Commission  
Office of Nuclear Material Safety and Safeguards  
Division of Waste Management and Environmental Protection

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## EXECUTIVE SUMMARY

More than 30 years ago, the United States Congress enacted the Safe Drinking Water Act (SDWA). Regulations promulgated pursuant to the SDWA impose specific requirements on the levels of contaminants (including uranium) that may be present in drinking water sources used for public consumption. In 1990, the U.S. Environmental Protection Agency (EPA) promulgated a proposed rule mandating that the levels of uranium in drinking water sources (i.e., maximum contaminant levels (MCLs)) be limited to 20 micrograms/liter (Fg/L) or 20 parts per billion (ppb). In 2000, EPA promulgated a final uranium MCL of 30 Fg/L, or 30 ppb and imposed strict deadlines for compliance. The rule requires that municipalities and other operators (now estimated at 1000–2000) must comply with these new requirements by 2007.

Removal of uranium would result in: (1) the water treatment facility being in possession of source material<sup>1</sup> (uranium) exceeding 0.05 percent of the mixture; and (2) the facility possessing greater than 15 pounds of uranium in a very short period of time. Therefore, these local water treatment facilities, numbering in the hundreds or possibly thousands, would need U.S. Nuclear Regulatory Commission (NRC) licenses to possess the uranium and would have limited options for the disposal. Title 10, Code of Federal Regulations (10 CFR) Section 40.13, “Unimportant Quantities of Source Material,” defines the amount of source material that can be possessed before a specific license is required.

In response to this new MCL, R.M.D. Operations, LLC (RMD), requested a license for a uranium water treatment program for: (1) removing uranium from community water systems (CWS’); (2) storing uranium residuals in a self-contained uranium removal system (URS); and (3) disposing of such uranium residuals in facilities licensed under the Atomic Energy Act of 1954, as amended (AEA), to assure safe and secure final disposition. As described in this Environmental Assessment (EA), final disposition of uranium residuals will either be as a waste, or as an alternate feed for processing at AEA-licensed uranium recovery facilities for introduction into the commercial nuclear fuel cycle as “yellowcake.” The RMD uranium water treatment program will provide CWS’ with the capability to remove uranium from drinking water sources in compliance with the SDWA uranium MCL without the need for the CWS to procure relevant expertise in handling radioactive materials. The program will also provide the capability to permanently remove such uranium from the CWS’ without releasing it in the absence of meaningful controls (e.g., backwashing to sanitary sewers or otherwise to the environment).

By letter dated September 27, 2005, RMD submitted an application to NRC for a source material license for its uranium water treatment facilities. The RMD license application proposes that NRC issue a performance-based, multisite license for RMD’s uranium water treatment program, as implemented by RMD in non-Agreement States, which will create licensable concentrations of source material exceeding the limits in both 10 CFR 40.13, for unimportant quantities, and in 10 CFR 40.22, “Small Quantities of Source Material,” for annual and total amounts of source material. Under the AEA, such licensable uranium source material

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<sup>1</sup>Source material is defined in 10 CFR 40.4, “Definitions,” as “(1) uranium or thorium, or any combination thereof, in any physical or chemical form, or (2) ores which contain by weight 0.05 percent or more of uranium, thorium or any combination thereof.”

is subject to NRC regulatory control and oversight. As the licensee, RMD will have ownership and/or control of its URS, the system's operation, and possess all licensed materials contained therein, including treatment media and licensable uranium source material removed from the treated water.

As discussed in the technical evaluation report, NRC staff has reviewed the concept of a performance-based, multisite format. RMD has proposed to create a Safety and Environmental Review Panel responsible for compiling all relevant information for each proposed water treatment system installation and for ensuring that such installations are bounded by both NRC's EA, the imposed license conditions, and licensee commitments within all referenced documents.

The RMD license application consisted of three parts: 1) a license application letter describing the proposed format of the requested license; (2) an environmental report that presents RMD's description of its proposed water treatment program and environmental analyses of its potential occupational and public health and safety impacts and those of relevant alternatives; and (3) a draft safety analysis report presenting the generic overview of RMD's water treatment operations under its proposed license.

RMD designed its proposed licensing action to address an issue (i.e., compliance with drinking water standards) that is of national concern. As a result, many CWS requiring uranium water treatment will be located in Agreement States. RMD requested that NRC staff facilitate the involvement of Agreement States in the licensing process. NRC staff agreed and will be providing the draft EA to all states for review and comment.

## Conclusion

Overall adverse environmental impacts are expected to be small. Overall beneficial environmental impacts are expected to be small to moderate. There will likely be little environmental impact on land use, geology and soils, ecology, air quality, noise, historical and cultural resources, visual and scenic resources, socioeconomic resources, or public and occupational health. There may be minor adverse environmental effects on transportation and waste management. Beneficial environmental effects are expected to accrue for public health and water resources.

On the basis of the EA, NRC has concluded that there are no significant environmental impacts from the proposed licensing action and NRC staff has determined not to prepare an environmental impact statement. Accordingly, NRC has determined that a Finding of No Significant Impact is appropriate.

## **1 INTRODUCTION**

The U.S. Nuclear Regulatory Commission (NRC) staff has prepared this Environmental Assessment (EA) for the R.M.D. Operations, LLC (RMD), application for a performance-based multisite license for a uranium water treatment program. RMD has applied for an NRC license under Title 10, *Code of Federal Regulations* Part 40, (10 CFR Part 40), "Domestic Licensing of Source Material," to receive, possess, use, transfer, or deliver source material, specifically, uranium in excess of 0.05 percent by weight. RMD is a full-service provider of products and water treatment systems to community water systems (CWS') throughout the United States. It proposes to use ion exchange (IX) technology to remove uranium from drinking water sources. The IX technology will concentrate uranium on the exchange media in quantities greater than 0.05 percent uranium by weight and in quantities exceeding 15 pounds of uranium, thus requiring an NRC specific license. These drinking-water sources are primarily water-supply wells that small CWS' use to supply water to a limited number of persons, residences, and businesses.

RMD proposes to act as a provider of uranium water treatment products and systems to CWS' throughout the United States. Water from a well or a series of wells will be routed through RMD's IX uranium removal system (URS). RMD will maintain ownership of the URS and will be considered to be in possession of uranium source material that is contained on the IX media within the URS. The treatment products of the URS may be housed within the CWS facility or in a newly constructed shed or similar structure. RMD and/or, personnel from the CWS who have been trained in radiation safety by RMD, will monitor the treatment products of the URS. RMD will use space leased or provided by the CWS to operate the URS. A consolidated operations plan for each URS at each facility will outline operation of the URS and safety-related requirements. RMD is required to provide a financial assurance process for both operations and decommissioning through a mechanism that will be reviewed as part of the Technical Evaluation Report (TER). This mechanism must be found satisfactory by NRC.

NRC staff members have evaluated RMD's request and have developed this EA to support the review of RMD's proposed license request, in accordance with the requirements of 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." This action, and the associated technical evaluation, is limited to RMD URS' in non-Agreement States. However, because of the scope of the issue in July 2006 it was provided to both NRC Agreement States and the non-Agreement States for review and comment.

## **2 THE NEED FOR THE PROPOSED ACTION**

In 2000, the U.S. Environmental Protection Agency (EPA) promulgated a final uranium maximum contaminant level (MCL) of 0.03 milligrams per liter (mg/L) or 30 micrograms per liter (Fg/L). Before that time, a uranium MCL did not exist. CWS' are required to comply with the MCL by December 31, 2007, and need to remove uranium from their water supplies to quantities less than or equal to the MCL. The removal of uranium using certain technologies, such as IX, will likely result in the accumulation of uranium that meets NRC definition of licensable source material. Under NRC regulations in Part 40, uranium in a concentration of 0.05 percent or greater, by weight, is considered source material. Not only do CWS' need to remove uranium to comply with the new MCL, but also need to properly possess, store, transfer, and dispose of licensable source material as required by NRC in Part 40. RMD

estimates that this new MCL may affect several hundred CWS' in NRC non-Agreement States.

RMD will satisfy the need for CWS' to remove uranium from drinking water sources and comply with the MCL, by December 31, 2007, at those facilities that use the URS. RMD proposes to possess, store, transfer, and dispose of the source material for the CWS' by removing uranium from the water supply using IX technology, possessing source material in the URS, and ultimately transferring and properly dispositioning the source material.

### **3 THE PROPOSED ACTION**

#### **3.1 RMD Performance-Based Multisite License for a Uranium Water Treatment Program**

The proposed action is the issuance of a multisite license to RMD to remove uranium from CWS drinking water sources to levels at or below the MCL, using the URS, to safely contain uranium residuals, using proven IX technology and equipment, and to dispose of uranium source material at appropriately authorized or licensed facilities. RMD will maintain ownership of the URS, which it will provide to the CWS under lease. RMD may train and use CWS personnel to inspect the URS to ensure compliance with the multisite license. The URS will be secured away from the public either inside of the CWS facility or within a secure fence, a shed, or similar locked structure. RMD personnel will transfer, transport, and properly dispose of the resulting source material from the URS. Disposal options involve transfer and disposal at waste facilities appropriately authorized to accept source material or transfer to a licensed commercial nuclear fuel cycle facilities that may use the source material as alternate feed to recover source material uranium. Once used as alternate feed material, the resulting waste may be disposed of as 11e(2) byproduct material<sup>2</sup>.

### **4 ALTERNATIVES TO THE PROPOSED ACTION**

#### **4.1 No-Action Alternative - Not grant the license.**

This would result in the CWS' seeking either a Specific License from NRC or requiring them to operate under the restrictions of the current General License.

##### **4.1.1 License the facilities under the Current Regulatory Structure**

Under this alternative, NRC currently has in place two processes.. These processes, for the possession of source material include either the limited authorization under the general licensing provided by 10 CFR 40.22, or issuance of a specific license pursuant to 10 CFR 40.32, "General Requirements for Issuance of Specific Licenses."

Under 10 CFR 40.22, a person operating under a general license can possess up to 15 pounds of source material at one time and up to 150 pounds per year. The impact from using this general license to regulate water treatment facilities would be minimal on most water treatment

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<sup>2</sup> Byproduct Material means the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes....

facilities and NRC. A majority of the regulatory costs would be associated with the disposal of uranium. However, the staff believes that this provision will have little applicability to CWS' removing uranium. Because of the large quantities of water treated at even the smallest CWS', removal of even a low concentration of uranium, using IX technology, could result in a waste stream containing hundreds of pounds of uranium. Even if site-specific conditions allow the facility to operate within the scope of the 10 CFR 40.22 general license for a short period of time, many of these facilities will find it more economical to possess more than 15 pounds of uranium at one time because of processing considerations. Additionally, attempting to stay under this 15-pound limit could result in additional exposures or greater potential for spills because of the more frequent filter media replacements or backwashing that may be required. Therefore, although the 10 CFR 40.22 general license is possible for the water treatment facilities and regulatory bodies, most water treatment facilities will find such a license's limitations prohibitive.

The only alternative currently available for a facility that cannot, or chooses not to, operate under the existing general license is specific licensing in accordance with 10 CFR 40.32. Specific licensing would present a significant expense for water treatment facilities, many of which are not aware that they will fall under NRC jurisdiction.

## **5 ALTERNATIVES TO THE PROPOSED ACTION (ELIMINATED FROM DETAILED STUDY)**

### **5.1 New General License and Rulemaking Alternative**

The staff is pursuing changes to NRC's existing regulations. Because the costs associated with licensing under NRC's current regulatory structure, may be prohibitive to many CWS' and the benefits of removing uranium from drinking water far exceed the risks NRC is considering a Rulemaking to create a new general license. Under this alternative, CWS's could operate under the new rule, when finalized. During the development of the rule, CWS' would receive enforcement discretion from lack of a license if they meet the guidelines of a generic communication planned to be issued late in 2006.

To develop the new general license, the staff will establish a technical basis to determine the level of regulation necessary for processes that concentrate or extract uranium from drinking water, to provide adequate protection to worker and public health and safety, property, and the environment. These considerations will also need to include disposal and decommissioning requirements. The general license would address both existing technologies and the development of new technologies. Because of these considerations, NRC may need to limit the scope of the general license to specific water treatment technologies or conditions, to ensure adequate protection of worker and public health and safety, property, and the environment. These restrictions may limit the applicability of the general license, which would result in the need to still specifically license a smaller number of drinking water treatment facilities.

A normal notice and comment Rulemaking (development of the technical basis, proposed rule, and final rule) is expected to take approximately 20 months. Thus, if started in mid-2006, the final rule would be published in approximately the first quarter of 2008. Because EPA's deadline for compliance is December 2007, some operators will likely have begun removing uranium before implementation of a new general license, and therefore may still require specific



licensing by NRC.

## **6 AFFECTED ENVIRONMENT**

### **6.1 Land Use, Geology, and Soils**

The affected environment will be variable for this proposed action. RMD's multisite license may serve several hundred locations throughout the United States. The general location of these facilities can range from a rural area, to a separate lot in a residential setting within a city, to a separate portion of a large municipal complex. The size of the RMD URS also varies, but would be bounded by volume limitations that would act to limit the size of CWS' that can be used. Maximum flow rates, for the CWS, would be limited to 3000 gallons per minute (gpm). RMD's small URS will generally be used for CWS with well flow rates of less than 500 gpm. RMD's large URS will generally be used for CWS with well flow rates between 500 and 3000 gpm. In some cases a new utility shed or building will be built to accommodate the 3000 gpm URS. The total amount of land needed for the building, access, and parking would be approximately 3000 square feet. Considering areas needed for grading, site preparation, and utilities, the total land and soil area disturbed may be greater, but would not be likely to be greater than 10,000 square feet. Depth of grading would not be expected to exceed 3 to 5 feet, deep enough to build a foundation footing or trench for utility lines below the frost line and to meet local building codes.

### **6.2 Transportation**

Access to the URS is expected to be by paved or graveled roads, depending on the location of the facility. Users within towns or cities would likely have access to CWS facilities and well head(s) via paved roads. In rural locations, paved, gravel, and possibly dirt access roads may be used to reach CWS or CWS well head(s) where the URS may be installed. The URS will be shipped initially to the CWS over highways and secondary roads. The units may be sent in one shipment or in several shipments. Shipping of uranium source material, on IX resin beads, for final disposal or for use as alternate feed materials, would occur over the same roads. Shipments would likely be on or within commercial-sized delivery trucks or large trailers for the larger URS.

### **6.3 Water Resources**

CWS' pump ground water to supply their consumers with potable water. Each CWS will probably be designed differently. Some CWS' may have only one well, and the URS may be installed at that one well head. Some CWS' may pipe water from multiple wells to a single point of ground water treatment where the URS may be installed. From this single point of treatment, water is distributed to CWS consumers. For the proposed action, the number of ground water wells is not expected to increase. Increases in wells would only reflect a greater need for water. CWS' may be located near small streams, lakes, and water bodies. They would likely be located out of the flood plain, but may be located on terraces a short distance away from flowing bodies of water. In urban or suburban settings, they may be located near storm and sanitary sewer systems. Some larger CWS' may have a bathroom or interior drainage area and may need to discharge water to either a sanitary sewer system or a drain field.

#### 6.4 Ecology

Ecological issues at CWS' and associated lands are highly site-specific and can range from urban to rural landscapes. Potential affected plant and animal species will have to be identified specifically for each CWS and verified that there is no significant adverse impact.

#### 6.5 Meteorology and Air Quality

These resource areas are site-specific to each CWS and can range from urban to rural. Existing air quality at each CWS can likewise vary depending on the site setting, ranging from urban to rural.

#### 6.6 Noise and Visual/Scenic Resources

These resources areas are site specific to each CWS and can range from urban to rural. It would be expected that background noise in an urban setting would be greater than noise in a suburban or rural setting. Likewise, visual resources would vary greatly, ranging from urban to rural landscapes

#### 6.7 Historical and Cultural Resources

The CWS' may be located in various locations, ranging from urban or suburban, to rural. The area affected by land disturbance would likely be less than 10,000 square feet, or about 0.25 acre of disturbance, and much smaller in most cases for the smaller URS systems. Small sheds or structures and associated utilities built on CWS property would likely require a building permit. Permits required in areas of historical significance generally would be evaluated by an architectural review board or similar local governing body that would require that structures take into consideration historical architecture and blend in with historical surroundings.

#### 6.8 Socioeconomic Conditions

The CWS' may be located in various locations from urban, to suburban, to rural. Those affected would include local citizens who use the water from the CWS', as well as local governments or homeowner associations that own and operate the CWS' and provide water. These systems would likely be in areas with variable and diverse demographic and income levels.

#### 6.9 Public and Occupational Health

The CWS may be located in various locations, ranging from urban, to suburban, to rural. The affected public could live in various types of diverse communities. Those most affected are the direct end-user consumers of the water from the CWS. Those persons would be of various ages, sexes, and races and have various economic incomes. Based on the need for the proposed action, many consumers of water from CWS' may currently be ingesting levels of uranium that are above the recently promulgated uranium MCL. The URS would reduce those levels of uranium in the drinking water however, they would then be a accumulating source material at the location of the CWS within their communities. However, uranium in this diffuse form would be bound to the IX resins and contained within tanks inside the CWS' facility.

CWS' employees would be working in and around uranium radioactive source material that would be housed in small utility-shed-type structures, or within the existing CWS facility. RMD expects to train some of the CWS employees in monitoring and maintenance of the URS and in methods of working safely around uranium source material. CWS employees may be trained in responding to a spill or release of source material and containing such a spill, but they will not be expected to clean up nor remediate the spill or release. Instead, RMD has the capability to properly handle and clean up spills or releases of source material from URS'.

#### 6.10 Waste Management

Source material from the CWS will be disposed of in appropriately authorized and regulated waste facilities, or will be transported to similarly licensed uranium recovery facilities where the uranium on the IX resin can be used as alternate feed from which to recover uranium. Unless a facility licensed to receive source material is in the community where the CWS is located, source material collected within the URS would not remain within the community where it was generated. Uranium-laden IX resin will only be contained within the IX vessels at the CWS. Uranium-laden IX resin will not be stored at the CWS.

### 7 ENVIRONMENTAL IMPACTS FROM THE PROPOSED ACTION

#### 7.1 Land Use, Geology, and Soils

The RMD URS' will be sited at either existing CWS facilities or in small utility-type sheds near CWS well heads. For URS' sited at or within CWS structures, no effects on land use, geology, or soils would be expected, since no infrastructure construction would be required. For URS' sited near well heads or outside of the CWS' existing structures, minor land disturbance would be expected and primarily centered around initial small-scale grading and site construction. Land disturbance would be expected to be less than 10,000 square feet in most instances because of the bounding limitation of a system with a 3,000 gpm flow rate. Most likely, most communities would require a building permit for construction or placement of a utility-type shed, as well as erosion controls for land-disturbance activities. The minor land disturbance associated with construction would have little effect on geology and soils, since land disturbance would not be expected to extend beyond minor site grading and shallow foundation footings for the shed and minor trenching for electrical and plumbing utilities. Environmental impacts on land use, geology, and soils are expected to be small.

#### 7.2 Transportation

The roads used for the transportation of the URS and resulting source material would be the same as the CWS currently uses for receiving supplies for typical water treatment operations (e.g., treatment chemicals, maintenance equipment, and waste products, etc.). Visitors would likely use existing paved highways, secondary roads, and local roads, as well as gravel or dirt roads, to access the URS. Little additional usage of these roads would be expected. For larger CWS', CWS employees that RMD had trained in radiation protection and inspection would perform inspections of the URS. These inspections would be done in conjunction with normal inspections of equipment already contained within the CWS, and no additional trips would be required. For URS' located at well heads, regular inspections would require a slight increase in additional trips to the well head and the URS. These additional trips for inspections and regular

maintenance would cause only minor impacts on existing roads.

Resin or exchange media loaded with uranium from the IX vessel will be transported to either an appropriately authorized disposal facility or a licensed uranium mill for use as alternate feed material. Material will be transported in either U.S. Department of Transportation-approved (DOT) tanker trucks or large polyfabric "Super Sacks" that have been approved for transport of radioactive material. RMD expects 200 trips per year, per 1000 facilities served. Based on accident statistics, and an average nationwide travel distance of 1000 miles to the site of final disposition, RMD expects an accident, involving a spent treatment media shipment, to occur only once every 2.5 years. These accident statistics do not estimate the severity of the accident and consequences could range from a severe accident to a minor incident. It would not be expected that even a small number of these accidents will result in any release.

However, in the case of a transportation accident, any health and safety consequences are expected to be mitigated by the primary level of response, which will be from the transportation contractor's established response team and procedures. Before transportation, RMD will coordinate transportation accident response procedures with the transportation contractor, including post-remediation accident site surveys, and will conduct additional accident site surveys as necessary. In the highly unlikely event of an accident that ruptures a loaded tanker truck or Super Sack, some treatment media and residual water could spill on the ground. However, the treatment media will retain the uranium and prevent contamination of soils at the accident site. Such a spill also will only spread a limited distance and will be easily recovered. All treatment media, its contained uranium, and any contaminated soils will be removed and disposed of at an appropriately authorized facility. All disturbed areas would then be reclaimed in accordance with applicable State and NRC regulations. Thus, the risk of potential impacts on the environment from such accidents is negligible.

Further, RMD has analyzed highly unlikely but credible potential accident scenarios and the resulting radiation doses to members of the public from accidental releases of spent treatment media during transportation. These accidents were summarized in the Environmental Report in which RMD concluded that "The radiation doses from uranium-bearing water treatment resins under normal and spill conditions in the water treatment plant and transportation are, in general, negligible and in the range of background variability." The staff reviewed these calculations and agrees.

RMD is required to use appropriately authorized and/or permitted transportation contractors to transfer spent treatment media from CWS' to properly licensed facilities for final disposition. Transport containers must be approved under appropriate DOT regulations, for transport of Class 7 radioactive material. To ensure adequate transportation accident response at CWS' using RMD's uranium water treatment system, NRC will require RMD to develop transport accident response procedures and follow-up accident surveys. Environmental impacts related to transportation are expected to be small.

### 7.3 Water Resources

The number of ground water wells affected is not expected to change because of the need to remove uranium from drinking water. The same ground water that is currently in use is expected to be used in concert with the URS.

The URS system removes uranium from ground water in self-contained IX vessels. When the IX exchange media is near capacity, the media are removed and transported offsite away from the CWS. One possible effect on water resources would be from spills or a release of the IX media and the uranium that is bound to the media. If this were to occur, RMD could easily clean up the surface spillage if the material were contained within the treatment shed, CWS facility, or even on the ground. If the URS is housed in a treatment shed or within a CWS facility that has a floor drain, sump, or similar water catchment that leads to a sanitary sewer, storm sewer, or drain field, a major spill from the URS could cause exchange media and uranium source material to enter sanitary, storm, or drain fields and directly affect water resources. If a possible direct outlet to storm, sanitary, or drain field exists at the CWS, the URS would be designed within a secondary containment system, to protect against a release that could affect water resources.

The locations of CWS systems are variable. It is possible, but unlikely, that a CWS might be located in the 100-year flood plain. If a CWS were to have a well head or multiple well heads located in the 100-year flood plain, the URS should be constructed outside the flood plain. Water would have to be pumped from the well head to the URS. If the CWS primary treatment facility were located on a 100-year flood plain, the URS should not be housed within the CWS. The adverse effects of the RMD URS on water resources are expected to be small.

The RMD treatment system may have a beneficial effect on water resources. The proposed action will create a "cradle-to-grave" approach for handling and dispositioning of uranium. Under the current 10 CFR Part 40 general license requirements, some CWS' may opt to use IX technology and regenerate and backwash-exchange media to stay within current source material general license requirements. If a CWS were to choose to do this in lieu of transporting source material, there might be cumulative effects causing increases in uranium concentration in soils and ground water near the CWS with repeated backwashing onto the ground surface or into a drain field. It is also possible that backwash water could be released into drainage or storm sewers leading to surface water bodies. Discharged water released into surface waters would have to meet NRC discharge requirements, but these releases would likely be greater than those expected from RMD's URS since source material collected in the RMD URS is collected and dispositioned at facilities that are appropriately authorized and regulated. These beneficial effects are noteworthy, but expected to be small. The effects of the RMD URS on water resources are expected to be small.

#### 7.4 Ecological Resources

Ecological resources could be affected if a major onsite spill were to occur, but a major spill is unlikely. The secondary containment installed by RMD at CWS' should contain major spills. Minor spills would not be expected to affect ecological resources. Although transportation spills could affect ecological resources, these accidents are unlikely and most spills could be easily cleaned up. The effects of the RMD URS' on ecological resources are expected to be small.

#### 7.5 Meteorology and Air Quality

The RMD URS is designed to be self-contained, thereby limiting, if not eliminating, potential public or occupational exposure to airborne uranium residuals or other particulates. Environmental impacts related to meteorology and air quality are expected to be small.



## 7.6 Noise and Visual/Scenic Resources

Some minor noise impacts may be associated with construction of sheds or buildings to house the URS as well as associated utilities. During IX media exchanges, RMD service trailers will use diesel generator sets that will result in a minimal increase in noise impacts on limited occasions. Some minor visual impacts from the construction of small sheds and buildings to house the URS may be experienced. Environmental impacts related to noise and visual/scenic resources are expected to be small.

## 7.7 Historical and Cultural Resources

The construction of new buildings for containment of the URS' potentially may require assessment of historic and cultural resources, but any such impacts likely will be negligible. It is expected that where CWS' and URS' are located in and around historic towns and features, building permits would be required, as well as a review by a local architectural review board or similar type of governing body. Historical and cultural resource issues would likely be addressed at that time. Environmental impacts related to historical and cultural resources are expected to be small.

## 7.8 Socioeconomic

The costs associated with providing uranium removal from drinking water would likely be passed along to consumers of the water in the form of higher rates for water. Additional work related to construction of the URS may provide temporary jobs, and additional work related to the operation of the URS may provide a few permanent jobs. The amount of additional taxes or the number of jobs created are expected to be negligible on the local community. Environmental impacts related to socioeconomic resources are expected to be small.

## 7.9 Public and Occupational Health

The CWS' may be located in urban, suburban, and rural areas. Public access to the URS' will be restricted by keeping the URS' inside sheds or within existing CWS buildings. There is a slight chance of public exposure if persons were to break into a shed or CWS facility housing the URS. Exposure in this scenario would be minimal, since exposure on contact from the IX vessel is expected to be no greater than 0.3 mrem/hr, which would equate to 7.2 mrem over a 24-hour period, provided the individual had contact with the vessel for 24 hours. Since the URS will probably be inspected on a daily basis, it is likely that exposures from an unauthorized entry would be no greater than 24 hours or 7.2 mrem, a minor exposure. If the individual were in the building for that time and remain 30 centimeters away from the vessel -- a more likely scenario -- the exposure rate would be 0.003 mrem/hr, which would equate to an exposure of 0.072 mrem in a 24-hour period.

In the unlikely event of a major spill, RMD will initiate emergency response procedures designed to safely contain and remediate such a release. In facility areas that contain drains or other discharge points to the environment, RMD will be required to provide for secondary containment. In facility areas without discharge points, RMD will ensure that a major spill cannot leave the facility and be accessed by the public. The RMD URS will provide a benefit to the public by removing uranium concentrations above the MCL, reducing the public's exposure

to uranium. In addition, use of the RMD URS will remove uranium from the community. Uranium source material will be removed and disposed of at an appropriately authorized and regulated facility.

For occupational health considerations and requirements, RMD has instituted a radiation protection program, incorporating as low as is reasonably achievable (ALARA) limits, to satisfy the radiation protection and ALARA requirements of 10 CFR Part 20, "Standards for Protection Against Radiation." This program details the roles and responsibilities of the corporate radiation safety officer, RMD system specialists, and local utility operators working in the radioactive material area. The program describes the general rules for the safe possession of licensed material and area and personnel monitoring. RMD has calculated the potential annual dose to the local utility operators to be approximately 0.1 mrem/yr, assuming an operator may spend 100 hours per year, performing tasks near the IX vessel, at approximately 1 meter from a vessel at a maximum uranium load, producing 0.03 mrem/hr dose rate at the surface.

Inhalation hazards for workers are expected to be low. RMD will apply several NRC requirements, and yellowcake dust is a primary concern. It is unlikely that moist uranium-laden resin beads will become airborne, because they are larger than yellowcake dust.

RMD has calculated direct radiation dose rates from a spill cleanup for skin and inhalation as 3.69 mrem/hr and 2.1 mrem, respectively. The estimated inhalation dose rate was considered negligible since the treatment media particles, at approximately 600 micrometers in diameter, are too large to be respirable and are unlikely to remain suspended for any significant period of time.

Environmental impacts related to public and occupational exposures are expected to be small. Neither RMD system specialists nor the local utility managers nor operators are expected to receive annual radiation doses anywhere near the individual monitoring thresholds prescribed in 10 CFR 20.1502, "Conditions Requiring Individual Monitoring of External and Internal Occupational Dose." These aforementioned thresholds are 500 mrem/yr for adults or 100 mrem/yr for children or pregnant women. RMD has estimated maximum dose rates on the sides of the tanks to be between 0.2 to 0.3 mrem/hr and only 0.003 mrem/hr at 30 centimeters. RMD provided estimates of time operators should spend in the proximity of the vessels. The tables showed a maximum of 100 hours/year for the operational personnel. That time would result in an exposure of only 3 mrem for the year. This is a small fraction of the 340 mrem of background radiation those same individuals receive from natural sources.

#### 7.10 Waste Management

The media exchange resin will capture the uranium recovered from ground water. The resin beads will be periodically removed from the URS and the CWS and transported to an appropriately authorized and regulated facility. The resin may be disposed of in a permitted waste facility. The resin may also be transferred to a licensed uranium recovery facility that may use the uranium-laden resin for alternate feed material. If this occurs, the resulting waste would be considered 11e(2) byproduct material and may be disposed of in a licensed 11e(2) disposal facility. Environmental impacts related to waste management are expected to be small.

## **8 ENVIRONMENTAL IMPACTS FROM THE NO-ACTION ALTERNATIVE**

Environmental impacts from the licensing of individual CWS', the no-action alternative, would be similar to those of the proposed action, since a uranium treatment system of some type would likely need to be constructed. Because of the uranium MCL, the need for uranium removal would still exist. The only difference is that URS' would be constructed after the CWS' obtained specific licenses from NRC. Treatment technologies would likely be similar to IX technology, or possibly, reverse osmosis. The impacts on all resources, land use, geology, soils, transportation, socioeconomics, water resources, cultural resources, historical resources, waste management, and public and occupational health would likely be very similar to the proposed action.

If a CWS chooses to add more ground water wells in different aquifers or in areas with lower uranium contamination, the CWS could choose to blend water from different wells, together, to fall below the uranium MCL of 0.03 mg/L. Under this approach, some impacts from the no-action alternative may be different than those of the proposed action. This would likely cause the distribution of higher levels of uranium to consumers than would occur using the URS, but levels would still be considered safe since they would be below the MCL. If the CWS blended water, the CWS would not have to lease the URS, purchase such a system, invest in associated infrastructure other than new well(s), or have associated costs of source material handling and disposal, and it would have a lower chance impacting public and occupational health, since source material would not be accumulated.

## **9 MITIGATION MEASURES**

The RMD multisite license or the consolidated operation plan should incorporate the mitigation measures described below.

Under the multisite license proposed by RMD, RMD must contractually possess the uranium source material contained within the URS, including the IX vessels. RMD may lease space from the CWS to house the URS. If a URS sold or otherwise transferred to the CWS by RMD the CWS will be required to obtain an NRC-specific license, or comply with another future regulatory option promulgated or endorsed by NRC.

Uranium-laden (spent) IX resin is not to be stored at the CWS for greater than 60 days and will only be contained within the IX vessel.

Financial assurance for decommissioning is RMD's responsibility. RMD may accept legally binding financial assurance, from the CWS, covering the URS for the length of the lease, to provide for decommissioning. However, NRC must approve the financial assurance mechanism and incorporate as a license condition into the multisite license.

RMD will be required to consult with Federal or State fish and wildlife agencies for potential endangered species before beginning construction related to, or the use of, a URS treatment system that is located outside of, or away from, existing CWS structures.

RMD will be required to consult with State or Historic Preservation Officers before beginning construction related to, or the use of, a URS treatment system that is located outside of, or



away from, existing CWS structures.

To remove the URS from access by the public, it should be housed in a locked shed, structure, or within the CWS facility, and/or be within a fenced-in area and properly marked in accordance with Part 20.

In rooms with sumps, floor drains to sanitary sewer or storm sewers, or drain fields, secondary containment of the URS is required. The RMD Safety and Environmental Review Panel (SERP) should review every facility to ensure source material cannot reach floor drains, sumps, or similar features. For those that do contain these features, secondary containment must be provided.

Where the URS is located, RMD will be required to contact the fire marshal or equivalent and provide instruction on uranium source material hazards and possible effects from a fire.

RMD shall, at a minimum, use transportation accident response Standard Operating Procedures in accordance with the DOT-approved transportation contractor's response procedures. RMD also will ensure that follow-up accident site surveys are conducted, as necessary.

## **10 MONITORING**

Under the performance-based multisite license proposed by RMD, each CWS and associated possession and transfer of source material will be monitored, as proposed in the monitoring plan, contained within the consolidated operations plan. NRC will incorporate monitoring requirements and a change mechanism into the multisite license by reference. As long as the modifications do not reduce the this plan will allow, after review by the RMD SERP, the monitoring plan, to be modified. RMD must make available all changes the SERP makes to NRC and those changes must be kept during the life of the license.

## **11 AGENCIES AND PERSONS CONSULTED**

NRC distributed, for comment, a draft of this EA to Agreement and Non-Agreement State personnel and State agencies responsible for CWS' in each respective State. The comment period for the draft EA expired on August 31, 2006. As of that date no substantive comments had been received from any interested party.

NRC staff has determined that the proposed action will have no effect on listed species or critical habitat. Therefore, no further consultation is required under Section 7 of the Endangered Species Act. Likewise, NRC staff has determined that the proposed action is not the type of activity that will likely cause effects on historic properties. Therefore, no further consultation is required under Section 106 of the National Historic Preservation Act.

## **12 CONCLUSIONS**

Overall adverse environmental impacts are expected to be small. Overall beneficial environmental impacts are expected to be small to moderate. There will likely be little environmental impact on land use, geology and soils, ecology, air quality, noise, historical and

cultural resources, visual and scenic resources, socioeconomic resources, or public and occupational health. There may be minor adverse environmental effects on transportation and waste management. Beneficial environmental effects are expected to accrue for public health and water resources.

NRC staff has concluded that the proposed action complies with the objectives of performance-based risk-informed licensing as NRC endorses. The proposed action will comply with public and occupational exposure limits in Part 20. The adverse environmental impacts and the cumulative effects of the proposed action are expected to be small. Beneficial impacts will be realized as public exposure to uranium in drinking water will be reduced, as required by the uranium MCL. RMD's approach to management of uranium IX residuals and waste management options, will remove uranium source material disposal responsibility from those CWS' that utilize RMDs services.

NRC staff has prepared this EA in support of the proposed action to provide a multisite license to RMD for recovery, possession, and transfer of uranium source material regulated by NRC at CWS'. On the basis of this EA, NRC has concluded that there are no significant environmental impacts and that this license application does not warrant the preparation of an environmental impact statement. Accordingly, NRC has determined that a Finding of No Significant Impact is appropriate.

### **13 LIST OF PREPARERS**

Ron C. Linton, Senior Ground Water Hydrologist, NRC, and Michael G. Raddatz, Sr. Project Manager, Division of Fuel Cycle Safety and Safeguards, Fuel Cycle Facilities Branch, Uranium Processing Section.

### **14 LIST OF REFERENCES**

R.M.D. Operations, LLC, "Environmental Report in Support of a Performance-Based, Multi-Site License Application," September 2005.

U.S. Nuclear Regulatory Commission, "Environmental Review Guidance for Licensing Actions Associated with NMSS Programs," NUREG-1748, Washington, DC, August 2003.

U.S. Nuclear Regulatory Commission, "Actions Related to Regulation of Maximum Contamination Levels for Uranium in Drinking Water," SECY-06-0049, U.S. NRC, Washington, DC, March 2006.