



August 23, 2017

Via Overnight Courier

ATTN: Document Control Desk
Mr. Christopher Grossman, Project Manager
Division of Decommissioning, Uranium Recovery, and Waste Programs
Office of Nuclear Materials Safety and Safeguards
U.S. Nuclear Regulatory Commission
11545 Rockville Pike
Two White Flint North
Rockville MD 20852-2738

Re: **Renewal of License SUC-1591, Docket 40-9059** –
WRT Responses to RAIs of July 18, 2017

Dear Mr. Grossman:

In response to your email dated July 18, 2017 which provided a Request for Additional Information (RAI) related to the Water Remediation Technology, LLC (WRT) submittal of its license renewal application (dated December 21, 2016), enclosed are four (4) copies (1 official and 3 courtesy copies) of CDs which contain WRT's responses to the subject RAIs.

Please do not hesitate to give me a call (303-424-5355 Ext 108) if you have any questions regarding our responses.

Best regards,

Duane W. Bollig
Director – Environmental & Regulatory Affairs

Enclosures: 4 CDs - WRT Responses to NRC RAIs on the WRT License Renewal Application

cc: Ted Adams
Chris Pugsley, Esq.
file NRC 1.10

FROM SOURCE TO SOLUTION™



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August 23, 2017

**Renewal and Amendment of Source Material License SUC-1591
for Uranium Water Treatment
Water Remediation Technology LLC (WRT)
Docket 40-9059**

WRT Responses to Request for Additional Information (RAI), July 18, 2017

The following are WRT's responses to the RAIs identified as version "_v4 final" in the NRC's e-mail of July 18, 2017. The format will repeat the Comment and Path Forward parts of each comment, followed by WRT's response. The "Basis" portion of the RAIs are not repeated here; please refer to the complete RAI document to review this information. WRT's overall response includes many support documents, example documents requested by the NRC. These documents are provided in digital files as part of the accompanying CD.

Comment 1. *Additional information is needed to understand the purpose of amending the scope of WRT's licensed activities to include activities beyond drinking water treatment.*

Path Forward *Provide additional information to clarify the primary purpose of the license activities proposed under the request for an expanded scope.*

Response In WRT's original 2005 NRC license application for a source material license, the original purpose of treating public and private community water systems' drinking water sources to satisfy EPA's new Maximum Contaminant Level (MCL) for uranium in drinking water under the Safe Drinking Water Act (SDWA), an otherwise unfunded mandate, was to remove uranium source material from such drinking water sources primarily to protect the public from what were deemed harmful levels of uranium in said drinking water. It had become apparent that public and private community water providers, both large and small, wanted no direct part of the responsibility for and costs associated with the removal, handling, and disposition of radioactive materials, including but not limited to, uranium source material. Indeed, these community water providers appeared to recognize that radioactive materials such as uranium source material are governed by what can be considered to be a highly specialized statutory and regulatory program under the Atomic Energy Act (AEA) of 1954, as amended. While public and private community water providers received the benefit of WRT's expertise in removing and addressing disposition of these materials, WRT's intent to recycle and recover for the fuel cycle the removed uranium also provided a benefit as a viable energy resource.

Recycling the collected uranium remains an acceptable environmental protection strategy. As was stated in WRT's license renewal application, it currently has a contract with an AEA-licensed uranium producer (thereby accomplishing WRT's preferred alternative for final disposition) to which WRT already has sent shipments of uranium-loaded treatment resin for recycling. Further, WRT already has committed to sending uranium-loaded treatment resin to a properly licensed disposal facility if no licensed uranium producer is available to take such resin.

The regulatory interpretation previously rendered by NRC Staff that WRT's licensed uranium drinking water treatment operations did not constitute "uranium milling" because the uranium source material was not being removed from the drinking water source primarily for its source material content; but rather, the uranium source material was being removed primarily to bring a community water supply or system's (CWS) drinking water into compliance with the SDWA's new uranium in drinking water standard. The circumstances associated with the treatment of community water systems' drinking water sources has not changed and, as such, this interpretation also should not change.

With respect to the proposed addition of treatment of water to remove uranium at mine sites, pit lakes, groundwater remediation sites, or other similar sites, the legal/regulatory circumstances have not changed. For these examples, these water treatment activities are designed to provide remediation benefits for these sites and are not primarily intended to recover the uranium for its source material content, nor for any economic value. As is the case with community water systems, the uranium source material is being removed from water at these types of sites not primarily for the water's source material content; but rather, the uranium source material is being removed from these water sources primarily to remediate the water source and to assist site owners/operators in complying with relevant water quality standards such as "class of use" or discharge limits, or to make such remediated water legally and effectively useable in a given entity's process.

In these cases, the only difference between these sites and community water systems is the type of site, but there is no difference in the process itself or the final disposition of the uranium source material. In some cases, especially for groundwater-remediation projects for example, while the contaminated water source may not be a source of drinking water at the time of the uranium treatment, it could be a potential source of drinking water in the future. Therefore, for all examples cited in its license renewal application, the uranium source material is being removed from the identified water source primarily for reasons other than recovery of its source material content.

There is one final reason WRT is requesting to expand the scope of uranium water treatment in the renewed NRC license to include activities beyond drinking water treatment and that is to make the NRC license consistent and parallel to the scope that is already approved in many, if not all, of WRT's Agreement State licenses. Since the initial issuance of its NRC license, WRT recognized that it had focused too narrowly on only drinking water treatment. It was approached by a number of potential clients who had water treatment scenarios, other than drinking water, that could be solved with a treatment technology that was identical or substantively identical to that used by WRT for drinking water treatment. Accordingly, WRT already expanded the scope of its Agreement State licenses, either when a license application was made in a new state, or when an existing license was renewed, to apply to radionuclide (either radium or uranium) water treatment, in general. Therefore, with its NRC license renewal, WRT is simply requesting that the renewed license be consistent with its already-issued Agreement State licenses, with respect to uranium.

As documentation for the need for this expanded scope, WRT points to the uranium water treatment that it has provided to Cotter Corporation's Schwartzwalder Mine, Jefferson County CO, which is serviced under WRT's license issued by the Colorado Department of Public Health and Environment (CO DPHE) for over seven years. This system is not treating drinking water at

the mine site, but rather uranium-contamination water in a near-surface, alluvial groundwater system. A portion of this water potentially becomes a source of drinking water further downstream, however, when it reports to a storage reservoir in the foothills of the Denver metro area. In summary, WRT is already performing the type of work in at least one Agreement State that it is requesting of the NRC in non-Agreement States. It is also currently piloting a groundwater treatment operation in another Agreement State.

Comment 2. *Additional justification is needed to extend the scope of WRT's uranium water treatment technologies for uranium removal from other types of groundwater or surface water sources such as mines requiring dewatering, pit lakes, and other groundwater sources.*

Path Forward *WRT should provide additional information to address registration of non-drinking water treatment sites that is consistent with the quantity limits for general licenses in 10 CFR 40.22.*

Response WRT is aware that the limits for quantities of source material possessed on site at any one time and transferred within a calendar year for non-drinking-water applications in the revised general license regulations for small quantities of source material (10 CFR 40.22) have been significantly reduced from those of the past. If WRT is providing the uranium removal system and the radiation protection program (as part of a long-term service agreement) for a non-drinking-water treatment application, and the amounts of source material either stored on site at any one time or transferred during a calendar year exceed the limits prescribed in 10 CFR 40.22(a)(1) – currently, 3.3 lb source material (1.5 kg) or 15.4 lb (7 kg), respectively – then the subject treatment site will be operated under a specific license, presumably the WRT multi-site-specific license. If the treatment is a drinking-water application, however, the general-license limits for the unimportant quantities of source material (i.e., the general-license limits) increase to 15.4 lb (7 kg) or 154 lb (70 kg), respectively. In summary, the requirements of License Condition 20. of the current license remain in effect, and only the general-license limits for any non-drinking-water application have changed since the issuance of the original license.

Comment 3. *Additional justification is needed to amend the requirement to lease-back uranium removal systems (URS) that have been sold to clients.*

Path Forward *Provide additional information to identify whether there are instances where the terms identified above, and in the Environmental Report (WRT, 2016), are not included in a water treatment agreement or confirm that all water treatment agreements will include the aforementioned terms. This information is needed to assess whether WRT's water treatment agreements ensure compliance with 10 CFR 40.3.*

Response The subject WRT commitments that were presented in the Environmental Report are commitments that are agreed to in a standard long-term service agreement (i.e., the water treatment agreement) between WRT and its Client, including the understandings, commitments, and obligations listed below.

- WRT at all times owns the Z-92® treatment media and takes ownership of the uranium as it loads onto the media.

- WRT is involved with and monitors the installation of the treatment system by the client's general construction contractor, and WRT is responsible for the startup of the system to ensure its proper operation.
- The Client is required to provide WRT access to the client's facility and the treatment system at all times, especially for WRT to respond to an upset situation.
- As part of this public water supply facility, the client will ensure that the uranium treatment system is contained within a secured site.
- During the operation of the system, WRT is responsible for all service activities that have the potential for coming in contact with the licensed material.
- WRT is responsible for all spent media exchanges, including the removal of the final charge of spent treatment media and disposal at an appropriately-licensed facility, at the termination of the operation (this work, as defined in the standard agreement as "Deactivation"). WRT expects that any remaining decommissioning work tasks that are outside of the scope of Deactivation will be accomplished through a separate work order or agreement with the Client, developed at the time of termination.

Comment 4. *Additional justification is needed to amend the requirement to obtain properly executed contracts with properly licensed facilities for final disposition.*

Path Forward *Provide additional information to support that WRT will have assured continuing access to a final disposition path for uranium-laded (spent or fully-loaded) treatment media until the expiration of the renewed license. Additionally, provide an explanation of what actions WRT will take if the contract is broken. This information is needed to assess whether WRT's water treatment agreements ensure compliance with 10 CFR 20.2001 and 10 CFR 40.31.*

Response To clarify, WRT requested that the current License Condition 35 be deleted in the renewed license because it is redundant and unnecessary, given WRT is already required to dispose of the radioactive spent media in accordance with the general requirements of 10 CFR 20.2001, e.g., waste spent media (licensed material) must be transferred to a specifically-licensed disposal facility. This subsection does not require, however, that a disposal contract be in place prior to the start of licensed activities, as prescribed by License Condition 35. All that is needed is that a disposal agreement or a purchase order for the disposal event be in place prior to the shipment of the waste to the disposal facility.

WRT has available to it all the disposal facilities available to other entities that need to dispose of licensed source material. With WRT's preferred alternative of sending the uranium-laden media to a uranium recovery facility, the spent media isn't even classified as waste material, because it still has a function and value, so the requirements of 10 CFR 20 Subpart K, *Waste Disposal*, don't even apply. In that situation, however, WRT is still transferring the spent treatment media to a specific licensee, so it is still complying with the spirit of the requirements for transferring radioactive material to another licensed entity.

The other two requirements of License Condition 35 – designating a list of disposal sites for each CWS and selecting a final disposition location before transferring a shipment of spent treatment

media – are also unnecessary. Of course, WRT is going to select a disposal facility before it ships a load of spent media to that facility. This all does not need to be stipulated in a license condition.

This said, WRT does have agreements in place for transferring the spent treatment media from any CWS treatment site – an uranium-processing agreement with Cameco Resources, Inc., for its preferred alternative of sending the spent media to a uranium producer for the recovery of the contained uranium for the fuel cycle; and a disposal agreement with U.S. Ecology Washington, Inc., for the disposal of the typical spent media that will have uranium concentrations higher than the 0.05-percent-uranium limit for Unimportant Quantities of Source Material, of 10 CFR 40.13. For any spent media that is less than 0.05-percent uranium, WRT has a disposal agreement in place with U.S. Ecology Idaho, Inc. for disposing of that material at the facility at Grand View ID.

If WRT lost access to any or all of these three disposition locations that are currently available under agreements, then WRT would simply arrange for transferring the spent media to another facility. In the case of WRT's preferred alternative of recycling or recovering the contained uranium, possible other facilities it could turn to include, but are not limited to, another uranium ISR facility or Energy Fuels Inc.'s White Mesa Mill, Blanding UT. EnergySolutions, Inc., Clive UT, would be available for landfill disposal of spent media. WRT would continue to emphasize its preferred alternative of sending the spent treatment media to a uranium producer, but it would use a landfill disposal facility until such time that it entered into another uranium processing agreement.

Comment 5. *Additional Justification is needed for approval to dispose of bag filters in a municipal landfill.*

Path Forward *Provide additional information to demonstrate that the material collected on the bag filters is exempt from licensing per 10 CFR 40.13(a). If the material is not exempt per 10 CFR 40.13(a), WRT can revise the Environmental Report to indicate that disposal of the filters will comply with all NRC regulations and dispose of the bag filters in accordance with waste disposal requirements in 10 CFR Part 20, Subpart K, which may include WRT seeking, at a later date, NRC approval for alternative disposal under 10 CFR 20.2002. This information is needed to ensure compliance with 10 CFR 20.2001.*

Response WRT hereby drops its request for the approval and use of a dose-rate screening procedure and subsequent disposal at a local municipal or industrial landfill, for filter bags that may contain a small amount of the licensed material. If WRT decides to pursue this screening procedure again at a later date, it will do so under the procedures of 10 CFR 20.2002, for the approval of an alternate disposal approach.

Comment 6. *Provide additional information on operational impacts.*

Path Forward *Please provide summaries of the following information and data.*

- *Site-specific inspections that are referenced in Section 3.15;*

- *Inspection reports conducted by Agreement States;*
- *ALARA audit reports;*
- *Specific details of incidents/accidents (e.g., spills, pipe breaks), if any, and discussion of WRT's response to such incidents/accidents;*
- *End-of-year dosimetry reports for the past five years of operation that provide personnel and area badge dose data.*

The NRC requests this information to support its independent evaluation of potential impacts of the proposed action and its determination pursuant to 10 CFR 51.31(a).

Response Presented below is the WRT response to NRC RAI Comment 6 which requested summaries of site-specific inspections referenced in Section 3.15, inspection reports conducted by Agreement States, ALARA audit reports, specific incident/accident reports, and end-of-year dosimetry reports for WRT personnel and area badge dosimetry reports for WRT Uranium treatment systems. For the most part, these summaries encompass the last 5 years of WRT operation. The detailed supporting information for each requested item is presented in the accompanying CD.

Summaries of Site-Specific Inspections

This file folder presents the various inspections performed by WRT personnel at WRT Client Uranium treatment systems in operation. The file folder is separated into two subfolders, one which contains examples of the quarterly inspections performed by the WRT field service personnel and a second subfolder which contains periodic/random inspections performed by WRT radiological personnel.

Agreement State Inspection Reports

This file folder presents the various inspections performed by Agreement States on both Radium and Uranium treatment systems that WRT operates throughout the U.S. This file folder is separated into subfolder for each Agreement State that conducted the inspection(s). These include: CA, CO, GA, IL, NC, NE, NJ, NM, NY, TX, and WI. For the majority of the Agreement State inspections, the State regulator(s) found the WRT Radiation Protection was being implemented an effective manner and in compliance with their respective radiological standards and regulation.

For completeness, included are the inspections that did result in a Notice of Violation (NOV). For these reports, we have also included the WRT follow up corrective action and action taken to prevent recurrence in response to the subject NOV. It should be noted that none of the NOV's were related to worker, public or environmental safety or health. The NOV's focused on records maintenance, and financial assurance.

Annual Radiation Protection and ALARA Audit Reports

This file folder presents the Annual Radiation and ALARA Audit Reports from the last 5 years. These audits/reports are conducted and prepared by the WRT Corporate Safety Officer, Mr. Theodore Adams.

Incident/Accident Reports

This file folder presents the reports of the limited incidents/accidents that WRT has experience over the last 5 years at both the WRT radium and uranium treatment sites. The file folder is separated into two subfolders, one for TX (Radium) and the second for NE (Uranium). There were two incidents that occurred at the San Angelo, TX radium treatment system which involved the release a small amount of radium media within the treatment building. One that occurred on September 15, 2015 and a second that occurred on December 15, 2015. Included in this subfolder is the WRT notification(s), follow up corrective action(s), and actions taken to prevent recurrence. Also included is the TX regulator closeout letter for each of these incidents. There was one incident that occurred at the Grand Island, NE uranium treatment system. This incident involved a small pipe leak. Included in this subfolder is the WRT notification and letter presenting the corrective action and action taken to prevent occurrence. It should be noted that WRT did not receive a closeout letter from the NE regulator regarding the incident.

End-of Year Dosimetry Reports for WRT Personnel and Area Badge Dosimetry Reports

This file folder presents the dosimetry results for WRT personnel (Field Service and Radiological) and the Client Uranium treatment system area badges for the last 5-year period. This file folder is separated into two subfolders, one for the WRT Personnel and the second for the Client Uranium treatment system area badges.

A review of the WRT personnel dosimetry reports confirms that the doses to the WRT field and radiological personnel are low and in compliance with the WRT ALARA policy. It should be noted the WRT Personnel dosimetry reports reflect the dose to these personnel from radium and uranium treatment system while performing routine maintenance and media/resin exchange, and hence, overestimates the doses to these personnel from the Uranium only treatment systems. A summary of the WRT personnel dosimetry results is also included to allow the NRC reviewer to see the range and number of WRT personnel badged for each year.

A review of the Client Uranium treatment system area badge dosimetry results confirms that the doses to the general public/Client operator are well below the NRC/Agreement State public dose limit of 100 mRem/year. Reports are provided for those Uranium systems operating in CA (Bass Lake, Golden State Water, Mission Springs, and Royal Corizzo); CO (Cotter Corp. Schwartzwalder Mine); NE (Denton and Grand Island); GA (Lawrenceville); NJ (West Milford and Sussex); SC (Keowee Bay) and VA (Fox Run).

Comment 7. *Additional information is needed to support the description of the proposed actions and assessment of potential impacts.*

Path Forward *Provide a list of sites that WRT currently contracts its uranium water treatment technology in both Agreement and non-Agreement states, including Client physical address, Client point of contact, when the site was licensed, the current state of the license, and the sizes (flow rates, activity loadings(s) for the system(s), as well as any additional information included in the site-specific information packages. The NRC will use this information in its description of*

the proposed action and assessment of potential impacts. This information is needed to ensure compliance with 10 CFR 51.45(b).

Response Presented below is a summary of the information requested in RAI Comment 7. This summary includes the Client Name/Well Name, Well Site/Treatment Site Address, Well Flow Rate, System Configuration, RML No. (as applicable), Initial Date Licensed/Status, Maximum U Concentration/Maximum U Activity, and any supporting comments/information.

**WRT Uranium Removal Systems by State
Systems Under Long-Term Service Agreements**

Client Name Well Name	Well Site Address	Well Flow Rate (gpm)	System Config.	License No.	Initial Date Licensed/Status	Max. U Conc./ Max. U Activity	Comments
California							
Bass Lake Water Co. School Rd. Well	County Roads 331 & 274 Bass Lake CA 93604	125	Skid	7542-33	4/21/2006; 1 st 10-yr renew issued 3/24/2017	60,000 ppm; 300 mCi	Multi-site license, for U only.
Golden State Water Co. Yeager 2 & 3, and Vale 2	11077 Vale Drive Morongo Valley CA 92256	600	3 x MCS, in series	7542-33	3/24/2017; expire 4/21/2026	60,000 ppm; 409 mCi	
Mission Springs Water Co. Well 28	64355 Mission Lake Blvd Desert Hot Springs CA 92240	900	3 x Skids, In series	7542-33	3/19/2013; expires 4/21/2026	60,000 ppm; 354 mCi	
Colorado							
Cotter Corp. Schwartzwalder Mine	Schwartzwalder Mine Jefferson County CO	100	4 x MCS, in series	1177-01 Client is site license	7/29/2010; in 1 st 5-yr renewal review process	121,000 pCi/g; 2 Ci; Ra also authorized.	WRT's is a 3.N service provider license, for Ra and U.
					See above	See above	Groundwater remediation
Georgia							
City of Lawrenceville Ezzard Rd. Well	325 Ezzard Road Lawrenceville Ga 30045	130	Skid	GA-1584-1	3/29/2010; in 1 st 5-yr renewed Lic.	60,000 ppm; 350 mCi per sys	Multi-site license, for U and Ra.
Nebraska							
City of Grand Island, Central Basin Treatment Facility	2700 Well Field Road Grand Island NE 68801	3,500	2 x FE, in parallel	99-66-01	6/29/2012; in 1 st 5-yr renewal review process	60,000 ppm; 2.5 mCi per site	Multi-site license, for U and Ra.
				99-66-01	Same as above	Same as above	Largest U drinking water treatment system in U.S.
New Jersey							
Suez North America, Inc. (ex United Water); Well 2	216 Overview Drive Sussex NJ 07462	60	Skid	470762 Client is site licensee	2/7/2013; expires 7/31/2022	60,000 ppm; 0,2 Ci ea. site	WRT's is a service provider license, for U and Ra (0.2 Ci ea., Ra-224, -226, and -228.
West Milford MUA Birch Hill Well	Marshall Hill Road West Milford NJ 07480	50	Skid	n/a - Client is gen. licensee	Qtr 2, 2007; WRT service-provider lic., 2/7/2013 to 7/31/2022.	60,000 ppm typ.; Gen. lic. limits	This site was originally a NRC general-license site, pre Agreement State.
					Qtr 4, 2007; WRT service-provider lic. 2/7/2013 to 7/31/2022	60,000 ppm typ.; Gen. lic. limits	WRT's license – multi-site, specific license (Ra and U).
South Carolina							
Keowee Bay Property Owners Assoc.; Well 1	100 Crystal Cove Salem SC 29676	55	Skid	n/a – Client is gen. licensee	Ops started Qtr 2 2008	60,000 ppm typ.; Gen. lic. limits	WRT will service under reciprocity recognition.
Virginia							
Aqua VA, Inc. (ex Fox Run Water Co.); Chesdin Manor Well 1	Vicinity 4000 Chesdin Blvd, Sutherland VA 23885	80	Skid	n/a – Client is gen. licensee	Qtr 1, 2007	60,000 ppm typ.; Gen. lic. limits	WRT's multi-site NRC license transferred to VA DoH, upon Agree. State.

Notes: FE = Field Erected System MCS = Modular Component System PES = Portable Exchange System
Skid = Skid-mounted precursor to the MCS