



City of Grand Island

Tuesday, June 09, 2009

Council Session

Item G4

#2009-127 - Approving Pilot Study Agreement for Radionuclide Testing between the City of Grand Island and Water Remediation Technology

Staff Contact: Gary R. Mader; Wesley Nespor

Council Agenda Memo

From: Gary R. Mader, Utilities Director
Wesley Nespor, Asst. City Attorney/Purchasing

Meeting: June 9, 2009

Subject: Water Remediation Technology Pilot Study Agreement

Item #'s: G-4

Presenter(s): Gary R. Mader, Utilities Director

Background

In January of this year, the City awarded a contract to modify the water collector header systems at the City Wellfield to increase the operational flexibility to mix the water from the 21 wells there. The need for this modification was driven by new EPA regulation regarding uranium. For reference, the history of the regulatory action, source information and historical testing is provided below. The collector header modification project is nearing completion.

History:

In 2003, the new regulation placing a Maximum Contaminate Level (MCL) on uranium in drinking water became effective. Uranium is a naturally occurring element in the aquifers of Nebraska and other states across the nation. Implementation of the new MCL began with the sampling of the state's municipal water systems in accordance with the EPA specified testing protocol. Samples of the Grand Island water supply for regulatory compliance were first taken in 2004. The sampling protocol requires testing for four consecutive quarters, with the average of the year long sampling results being the level by which system compliance is established. Sampling is done at the points at which the supply waters enter the water distribution system, referred to as "Points of Entry". Sampling and testing of the Grand Island water system showed full compliance with the new regulation.

Uranium is not an acute concern but rather is a concern over a lifetime of exposure. According the *Neb-Guide from the University of Nebraska*, "...uranium in water supplies produces very little radioactivity, the health effects from exposure to uranium are primarily thought to be associated with the chemical properties of soluble uranium. Studies suggest that ingestion of high levels of uranium may be associated with an

increased risk of kidney damage...Exposure to soluble uranium in drinking water has not been shown to increase the risk of developing cancer.”

The Utilities Department has monitored the presence of uranium in the naturally occurring aquifer in Central Nebraska for many years. In a five year study, conducted from 1978 to 1983, sponsored by the Central Platte Natural Resources District and conducted by Dr. Roy Spalding of the University of Nebraska, the uranium levels in the Central Platte Valley were tested and mapped. From that study, it is known that levels of uranium can vary substantially over relatively short distances. Additionally, Nebraska Health and Human Services (HHS) has worked very closely with several cities in the state where test results showed area water supplies exceeded the newly promulgated MCL. Because of the known variability from the 1983 report and the confirmation of that variability by the more recent HHS work, the Utilities Department established a regular testing regimen of each of the 21 wells at the Wellfield. The testing confirmed that the levels of uranium vary from well to well and generally increase from east to west along the length of the island upon which the wells are located. Several of the individual wells on the westerly end of the island exceeded the newly established MCL. Because the sampling is from a composite of supply waters, the overall contaminate levels at the Points of Entry to the water distribution system meet the new standard. As a result of the Utilities Department's sampling, the staging of operation among the Wellfield wells has been modified to prioritize supply from the easterly, lower uranium wells. That also requires modification of the operation of the pumping station there.

At present, the collector piping at the Wellfield, which brings the water from each well to the central pumping station, is generally configured from two separate directions, east and west. In order to increase the ability to blend water from the wells, cross ties of the collector piping headers at the pumping station were required. This project is nearing completion.

Discussion

The Utilities Department has continued to seek additional options to address the new regulations, including treatment of the water from the Wellfield for uranium removal. Uranium is a metal that can be removed through conventional treatment, but the addition of a conventional water treatment plant is a very expensive option to address a single element. In its investigations, department staff became aware of a treatment process specifically designed for uranium removal. The firm of Water Remediation Technology (WRT) has developed a patented process that utilizes a filter media system which can be sized in increments. The WRT process is National Sanitary Foundation (NSF) certified for use in drinking water treatment applications. No chemicals are added for treatment, there is no backwash liquid waste stream, and the contractor disposes of the spent media in compliance with regulatory requirements. In order to verify performance, the Utilities Department solicited information from WRT regarding a pilot study to be conducted on site at the Wellfield. The contractor provided the attached proposed agreement for review by the City. It includes confidentiality provisions. The total cost of the pilot study is estimated at \$6,780.

In order to gain knowledge of uranium removal, with the potential to increase the margin of safety for compliance with the new regulation at the City's primary water supply source, it is recommended that the Department be authorized to proceed with the pilot study.

Alternatives

It appears that the Council has the following alternatives concerning the issue at hand. The Council may:

1. Move to approve.
2. Refer the issue to a Committee.
3. Postpone the issue to future date.
4. Take no action on the issue.

Recommendation

City Administration recommends that the Council approve the Agreement for Uranium Pilot Study with Water Remediation Technology of Fort Collins, Colorado, and authorize the Mayor to sign the agreement on behalf of the City.

Sample Motion

Move to approve the Agreement between the City of Grand Island and Water Remediation Technology, and authorize the Mayor to sign the agreement.

PILOT STUDY AGREEMENT

This Agreement (the "Agreement"), effective as of _____, 2009, is made by and between _____, ("Well Site Operator"), and Water Remediation Technology, L.L.C., 9500 W. 49th Avenue, Suite D100, Wheat Ridge, CO 80033 ("WRT").

RECITALS

WHEREAS, WRT owns or controls a radionuclide removal technology, equipment, and media (collectively the "Removal System") and desires to test the Removal System on the Well Site Owner's water supply well and collect data therefrom (the "Pilot Study"); and

WHEREAS, Well Site Operator desires to have WRT conduct the Pilot Study on the Well Site Owner's water supply well.

NOW THEREFORE, in consideration of the mutual premises and promises in this Agreement, the receipt and adequacy of which are hereby acknowledged, the parties agree as follows:

I. Removal System Testing

Well Site Operator shall permit WRT to implement and test the Removal System in Well Site Operator's water supply by installing the Removal System at its well site (the "Premises"). WRT will furnish and install the Pilot Study equipment, provide start-up services and provide operational and safety training for a fee of \$2,500.00 payable by the Well Site Operator. The Well Site Operator will not charge WRT in connection with the Pilot Study, but will itself be responsible to pay for all water sampling and testing during the Pilot Study in addition to the above fee. Well Site Operator shall have no express or implied obligation to purchase the Removal System from WRT.

II. Sampling and Analytical Laboratory Costs

To verify and assess the Radionuclide Removal Pilot System performance, water quality sampling and analysis is required at the start and periodically throughout the testing period. The Well Site Operator agrees to provide on-site sampling and testing in accordance with the sampling schedule throughout pilot test period. The Well Site Operator will not charge WRT in connection with the Pilot Study, but will be responsible to pay for all water sampling and laboratory analytical costs including sample freight costs to approved off-site analytical laboratories. WRT will provide a good faith pilot testing analytical cost estimate for the initial water quality testing and all anticipated subsequent water quality tests. Any additional water quality tests and their associated costs in addition to those listed in the sampling schedule document will be paid by WRT.

III. Post-Testing Obligations

WRT shall retain possession and dispose of any and all radionuclide-loaded media and by-products resulting from its testing activities in compliance with applicable law. Upon completion of the Pilot Study, WRT shall decommission and remove its equipment from the Premises and return the water system to its original condition prior to installation of the Removal System, at no cost to the Well Site Operator.

IV. Confidentiality

4.1 Unless otherwise agreed to in writing, Well Site Operator will not, for any reason, access, sample, test or analyze the media, the equipment, or other parts of the Removal System, which are WRT's trade secrets and confidential information.

4.2 Well Site Operator shall obtain a signed writing from all agents, consultants, or contractors (individually, a "Third Party") likely to have access to the Removal System, agreeing to the provisions of paragraph 4.1, which signed writing shall be obtained prior to or contemporaneous with access by Third Party to the Removal System.

4.3 The provisions of paragraph 4.1 and 4.2 are subject to the obligations of disclosure by the Well Site Operator pursuant to any relevant statute or court order. The Well Site Operator agrees to give WRT notice of any request for disclosure which the Client receives and to permit WRT, at WRT's cost, to oppose any such application.

4.4 WRT would be irreparably damaged by a breach of this Section IV, so in the event of any such breach, in addition to any other remedies that may be available at law or in equity, WRT shall be entitled to obtain injunctive relief against the Well Site Operator, or any individual, to enforce its rights.

V. Limitation of Liability

5.1 Each Party shall indemnify and save harmless the Other Party (and its officers, agents, employees, consultants, affiliates, successors, and assigns) from and against any and all claims for injury, death loss or damage (including expenses and attorney's fees) caused by, arising out of, resulting from, or incident to the indemnifying party's activities on the Premises, except where the sole proximate cause of such injury, death, loss, or damage is the negligence of the Other Party. Any limitation on indemnity by the Well Site Owner will be equally applicable to WRT.

5.2 With respect to Paragraph 5.1, neither party shall be liable to the other for any special, indirect, incidental, consequential, punitive, economic, or exemplary damages, including loss of revenue, data, goodwill, or profits, whether based on breach of contract, tort (including negligence), warranty, or theory of strict liability or otherwise, and whether or not either party has been advised of the possibility of any such damage.

VI. General Provisions

6.1 This Agreement embodies the entire understanding of the parties and supersedes all previous communications, representations or understandings, either oral or written, between the parties relating to the subject matter hereof.

6.2 No amendment or modification hereof shall be valid or binding unless made in writing and signed by each party.

6.3 If any provision of this Agreement is held to be invalid, illegal, or unenforceable to any extent, the remainder of this Agreement shall continue in full force and effect.

6.4 The provisions of this Agreement shall be binding upon each party's successors and assigns.

6.5 This Agreement shall in all respects be governed by, and enforced and interpreted in accordance with the laws of the State of Colorado, except its rules relating to conflicts of law, as if the Premises were located in Colorado. Any litigation between the parties shall be initiated in the courts of Jefferson County, Colorado, to which each party admits jurisdiction and venue.

IN WITNESS WHEREOF, the Parties have executed this Agreement as of the date first set forth above.

WATER REMEDIATION TECHNOLOGY, LLC

By: _____
Ron Dollar, VP Marketing

Date: _____

WELL SITE OPERATOR

By: _____

Its: _____

Date: _____



Z-92™ Uranium Removal System Pilot Study Description

for

Grand Island, NE

PWS ID# [REDACTED]

Pilot Study Description
Introduction and Process Overview
Installation Instructions
Safety Procedures
Start-up and Operations
Equipment Maintenance
Sampling and Test Procedures
Test Protocol
Pilot Study Conclusion
NSF Certification
Operation Log

February 25th, 2009



Pilot Study Description

Job Name: Grand Island, NE Job Number: _____

Job Location: Treatment Site: XXXX Start Date: April 1st, 2009

System Configuration	Trailer Pilot Unit
System Serial #	None
Number of Columns	3
Column Height	5 ft
Column Diameter	6 in
Z-92™ Media per Column (lb)	Approximately 8 lbs
Design Flow Rate	~1.5 GPM
Pump Size and Model	None required

Pilot Site Description

The pilot unit will be located at treatment site XXXXX. Source water for the pilot will be raw water, taken prior to chemical treatment at the location.

Discharge water from the pilot unit will be released on site for irrigation.



Uranium Pilot Cost Estimate

Pilot run time: ~50 days (assuming a 24 hr run day at ~1.5 gpm)

Sample Points: Raw (feed)
C1 (post column 1)
C2 (post column 2)
Discharge (post column 3)

	<u>Estimated Analytical Cost</u>	
Total number of sample dates: 8		
Total No. of samples/tests for U & GA: 32	U (\$35) + GA (\$55) = \$90	\$2,880
Total No. of Water Quality samples/tests*: 3	\$400	\$1,200
Total No. of Ra 226 & 228 samples/tests: 1	226 (\$100) + 228 (\$100) = \$200	\$200
	subtotal for analytical cost	\$4,280
WRT Pilot Study Fee:		\$2,500
	Estimated Total Cost	\$6,780

* Water Quality Test include the following:

<u>Metals</u>	<u>Wet Chemistry</u>
antimony	alkalinity
arsenic	carbon, total organic TOC
barium	chloride
beryllium	fluoride
calcium	hardness
chromium	nitrate/nitrite as N
copper	nitrite as N
iron	phosphate
lead	sulfate
magnesium	residue (TDS)
manganese	
mercury	
nickel	
potassium	
selenium	
silica	
sodium	
strontium	
thallium	
uranium	
vanadium	
zinc	

Notes:

The first set of samples (U & GA) will be taken approximately 1 hour after starting the pilot.

The first water quality sample will be taken shortly after setup as a raw water sample.

The second and third water quality samples will be taken as raw & discharge ~ midway through the pilot.

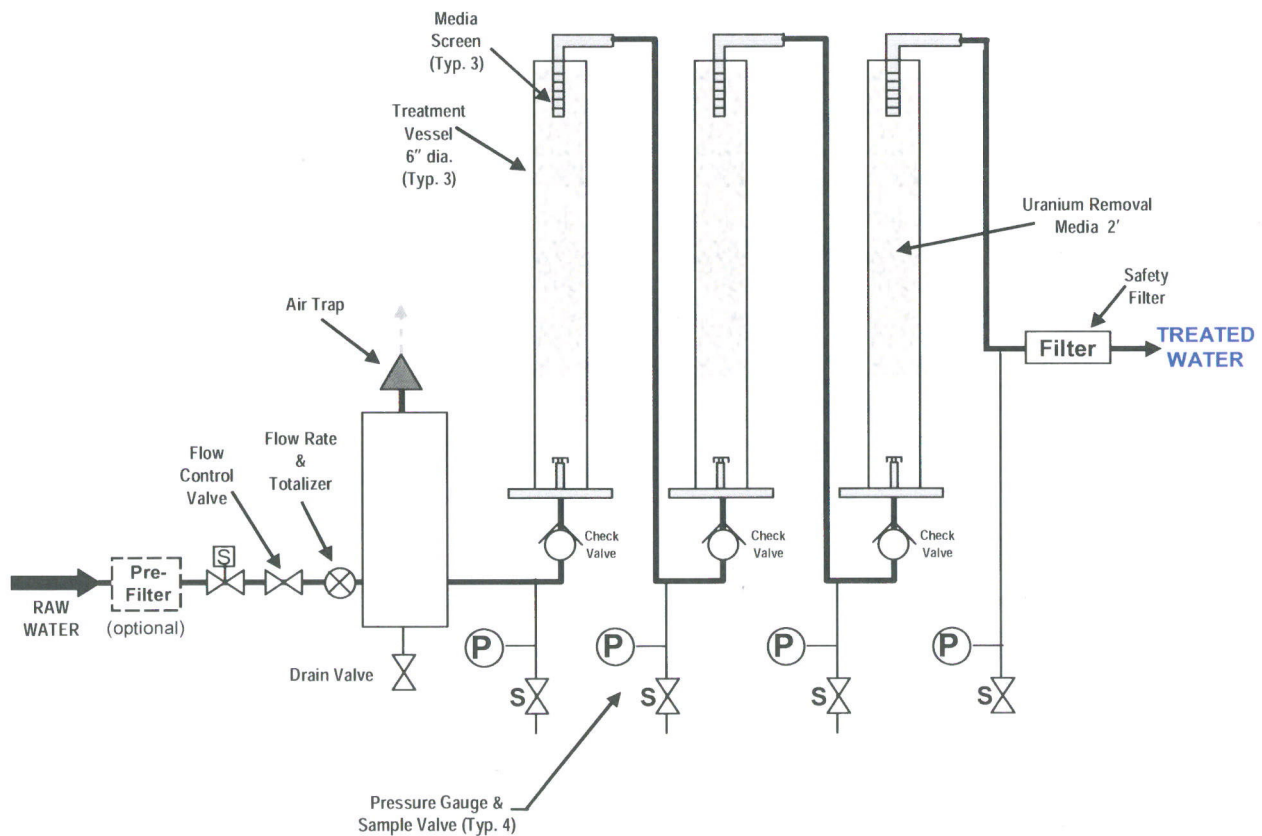
The sample for radium will be taken at the beginning of the pilot to establish compliance or concern.

Introduction and Process Overview

Introduction to the Z-92™ Uranium Removal System

Water Remediation Technology's Z-92™ Uranium Removal System removes uranium from drinking water in a fluidized bed using an adsorptive media process. The process has been designed for simplicity of operation, minimal maintenance, and requires no chemical pretreatment. No liquid waste stream is generated by the processed water and used media (classified as TENORM) is disposed of in a licensed facility by WRT.

The Z-92™ system is designed to meet the water production requirements of a specific treatment facility. The basic Z-92™ system configuration is shown below.





Z-92™ Uranium Removal - Process Overview

WRT's patent pending uranium removal system based upon WRT's uranium removal media, Z-92™. Uranium laden water is passed through columns of Z-92™ media in an up-flow manner at velocities that expand the bed of Z-92™, insuring that each particle is in intimate contact with the water and that any particulates in the water pass through the bed. Z-92™ is suitable for uranium removal due to its extremely high surface area (30 square meters / gram) and its affinity for capturing anions.

Z-92™ is placed in vertical columns, or stages, with sufficient depth of media to achieve the required EBCT (Empty Bed Contact Time), typically 1 to 2 minutes per stage. Depending on the uranium and other contaminant content of the feed water, multiple stages (typically 2 to 6) can be used for treatment.

Because of the low uranium content in the water, and the large quantity of media in the system, no media exchanges are typically required during the course of a pilot study.

Advantages of the WRT Z-92™ Uranium Removal System include:

- Z-92™ Uranium Removal Media is NSF, Standard 61 certified for use in drinking water applications.
- No chemicals are added in the treatment process, and nothing is imparted into the water during the treatment process.
- No liquid waste stream is generated by this process.
- Pre-treatment for iron removal is not required.
- Safe disposal of material to appropriate licensed waste facility by WRT.
- Minimal maintenance and operation required, only routine sampling and monitoring. No handling of media or chemicals by Utility personnel.
- Guaranteed process performance.



Installation Instructions

Installation of Z-92™ Equipment

Installation of the Z-92™ Uranium Removal Equipment requires a minimum of effort as the system arrives at the site in a self contained trailer, with all equipment fully assembled and tested prior to arrival. The Z-92™ system is to be installed by trained WRT technicians.

The Z-92™ system is self-contained and requires a minimum of plumbing and electrical connections. Setup of the Z-92™ equipment consists of the following steps:

1. Level and secure the trailer at the site.
2. Connecting the water source to the trailer inlet connection.
3. Connecting the discharge line (effluent) on the Z-92™ trailer to the appropriate discharge point.
4. Connecting electrical power to the trailer to operate lighting and heating, if required.

The pilot unit should be located as close to the source well as possible to minimize inlet piping.

WRT personnel or trained representatives will complete all necessary work to put the system into operation. The Utility will need to provide a single 120VAC, 15 amp power source for the pump (if required), an access point for source water and a discharge point for treated water.

A brochure showing the WRT Z-92™ Uranium Removal Mobile Pilot Study Program is attached as Appendix A.

Securing the Z-92™ unit

The self-contained Z-92™ trailer mounted pilot unit should be strategically placed and leveled to ensure maximum operating efficiency and ease of access. The trailer should be properly secured.

Plumbing Connections

Feed

The pilot trailer comes equipped with fittings for connecting to the water supply via bulkhead fittings located on the exterior of the trailer. Care should be exercised in making fitting connections to prevent water leaks. All connections should maintain proper alignment so as to avoid improper loading on all connections.



Discharge

The pilot trailer also comes equipped with discharge fittings via bulkhead fittings located on the exterior of the trailer. A discharge line needs to be installed to route the treated water to a discharge location.

Pump

If the utilities water system does not have approximately 15 PSI available, a supply pump requiring a source of 120VAC electrical power will be used. The pump is located inside the pilot trailer.

Flow Control

A flow control mechanism is provided to regulate the influent flow to the Z-92™ system.

Electrical Connections

The Z-92™ system may require a 120VAC electrical power source for operation of a pump, heating and lighting, if required. Electrical connection to the pilot trailer is via electrical plug connection located on the exterior of the trailer. Typical precautions should be taken when installing electrical power around a source of water. It is recommended that electrical connections be made only after equipment is fully installed. Electrical connections should be performed by a certified electrician.

Z-92™ Treatment Media

The media will be installed into the treatment columns prior to arrival at the test site. The media will remain in the columns during the course of the test. Upon completion of the pilot study, the media will be removed from the site by WRT.



Safety Procedures

Safety Procedures

The Z-92™ system is simple to use and requires a minimum of operator interface. Setup and replacement of media, if required, will be performed by trained WRT representatives so that a minimum of system interface is required by utility personnel. However, when working with the Z-92™ equipment the following precautions should be adhered to:

- To reduce risk of electrical shock, this equipment must be properly grounded.
- Inspect equipment thoroughly before connecting electrical power.
- Qualified personnel or a certified electrician should perform power connections.
- Always disconnect power before servicing equipment.
- This equipment should be used only for the purpose and function for which it was designed.
- Safety equipment should be used when performing any checks or service maintenance on or near the top of the process columns.

Media Safety

Each treatment column has an 80-mesh well screen at the discharge point to keep media from exiting the column. In addition, a 100-micron safety filter, as shown on the Pilot Unit Equipment Diagram, is installed at the discharge of the pilot unit to trap any media particles that may escape from the treatment columns. This safety filter is equivalent to the 100-micron safety filter installed in a full scale system.

Contaminant stability within the media

The uranium ions attach to the treatment media by the mechanism of ion exchange. There are no changes in water chemistry that would cause the uranium to be released from the treatment media.

Radiation Safety

WRT is licensed by the NRC for operation of its uranium systems in the 16 non-agreement states. WRT is also licensed by the Wisconsin Department of Health and Family Services, Radiation Protection Section, the Illinois Emergency Management Agency, Division of Environmental Safety and has been issued a Radioactive Materials License by the New Jersey State Department of Environmental Protection, Bureau of Environmental Radiation and the State of California Department of Health Services.



Start-up and Operations

Start-up and Operation of Z-92™ Equipment

Z-92™ System configurations are designed to meet the needs of the specific installation. This equipment is designed to collect data that will allow WRT to design and predict long term performance. Typical systems utilize a series of two to six process columns sized to meet the flow rates of the treatment facility.

Pilot Unit Start-Up Procedure

- Check to make sure all sample valves are open and any pilot unit discharge valves are open.
 - As the column fills with water, close the sample valve and proceed to the next column.
- After all of the columns are filled with water, slowly ramp up the flow to the predetermined flow rate.
 - Tap the sides of the column with a rubber mallet to remove any large air bubbles.
- Monitor column flow, pressures, and pressure differentials. A large overall pressure or a large pressure differential between columns is indicative of a plugged discharge screen or an air lock somewhere in the system.
 - Depending on the size and height of the columns, the pressure drop per column ranges from one to three psi per column.
- If pressures are not normal, shut down the flow and bleed the pressure off through one of the sample ports.
 - Usually, restarting the flow will eliminate the plugging problem.

Ongoing Operation

The trailer mounted pilot system is designed to collect data which will allow WRT to predict the media life on a particular water source. The operation of this pilot may vary from the typical operational sequence of a normal full scale system. Once the test unit has operated for a sufficient period of time, the loaded media will remain in the pilot trailer for transportation and proper disposal by WRT at an approved disposal site.



Equipment Maintenance

The Z-92™ system requires minimal maintenance to perform properly. Upon installation, it is recommended that the system be monitored closely to ensure that any pumps, flow meters, and valves are operating properly. The flow meter is located in the source water line should be checked once per day to ensure that the system is achieving the designed flow rate. *Please refer to pump and motor manufacturer's operation and maintenance instructions for proper maintenance on peripheral equipment.*

Weekly Maintenance

1. CHECK FEED WATER FLOW RATE

The feed water volume through the flow meter should maintain the designed flow rate.

2. CHECK FOR LEAKS

- Ensure that all lines and fittings are free of any leaks. Tighten any connections that are leaking. Teflon tape or paste may be required.
- Check the pump fittings regularly to ensure that there are no leaks.

Monthly Maintenance

1. CHECK POWER

Verify that AC voltage is correct.

2. CHECK FILTERS

Check filters located on the bulkhead (top) of each process column. Check filters to ensure that there is not a buildup of media particulates that would reduce flow to the next column in sequence.



Sampling and Testing Procedures

Each process column is equipped with a valve for sampling the effluent water for uranium content levels. When a sample is required, the sampling valve should be opened and water should be allowed to flow for approximately five (5) seconds before filling the sample container. Typical test sample volume is about 1 gallon for radionuclides analysis and 250 mL for metals analysis. Both containers must be preserved with 1:1 Nitric acid. Close the valve when an adequate amount of sample water has been taken. All sampling will be performed by Utility personnel.

Analytical testing will be performed by a qualified, independent lab, approved and agreed upon by the Utility and WRT prior to beginning the pilot study.

Methods of analysis to be used are:

Uranium	EPA Method M200.8 ICP-MS
Gross alpha	EPA Method M900.0
Gross beta	EPA Method M900.0
Radium 226	EPA Method 903.1
Radium 228	EPA Method 904.0

The proposed test protocol is shown below in Table 1.

An Operation Log will be completed during the course of the pilot study. This will include all field observations, adjustments, flow and totalizer data, date, operator and location and other relevant information. A copy of the Operation Log sheet is attached for reference as Appendix B.

The proposed length of this pilot study is approximately 49 days. Based on the test protocol, this will provide a total of 8 sets comparative radiological data comparing feed and treated water.



Table 1. TEST PROTOCOL – Water Samples

Uranium, Gross Alpha								
Day Sampled								
Sample Point	Day 1	Day 7	Day 14	Day 21	Day 28	Day 35	Day 42	Day 49
Feed	X	X	X	X	X	X	X	X
C-1	X	X	X	X	X	X	X	X
C-2	X	X	X	X	X	X	X	X
Discharge	X	X	X	X	X	X	X	X

Sampling of inorganic water quality parameters in both the feed and discharge water will be conducted twice, once after installation of the pilot unit and a second time about halfway through the pilot study. These will include: METALS - antimony, arsenic, barium, beryllium, calcium, chromium, copper, iron, lead magnesium, manganese, mercury, nickel, potassium, selenium, silica, sodium, thallium, uranium, zinc WET CHEMISTRY – alkalinity, carbon, total organic TOC, chloride, fluoride, hardness, nitrate/nitrite as N, phosphate, sulfate, residue (TDS).

Sample frequency will be adjusted, if necessary, as the piloting proceeds, based upon results from previous tests.

Solids analysis of the media and other tests may be conducted by WRT during and upon completion of the pilot study. Methods of analysis may include total-digestion methods, gamma spectroscopy, XRD, XRF and others for these and other elements.

Media analysis will be performed to measure the uranium loading of the media during the pilot study. A composite media sample from each individual column will be analyzed.

WRT Radionuclide Experience

WRT has completed over 60 radionuclide removal pilot studies in 17 states, with additional pilot studies underway. WRT has licensed and permitted full scale uranium installations in operation in California, New Jersey, North Carolina, and Virginia and over 40 licensed and permitted full scale radium installations in Illinois, Wisconsin, New Jersey, New York, North Carolina with additional systems under construction.

Pilot Study Conclusion

Upon completion of the pilot study, a Pilot Study Report will be written by WRT. This report will include the analytical data, operation log and other information collected during the pilot study. This data will be analyzed and presented in graph form where applicable, and observations and conclusions will be presented. This completed Pilot Study Report will be delivered to the Utility.



Appendix A

WRT Z-92™ Uranium Removal Mobile Pilot Study Program

Pages 13 - 14



WRT Mobile Pilot Study Unit

Pilot studies are conducted on drinking water sources containing contaminant levels exceeding the MCL. WRT will provide a trailer mounted pilot unit to the site to conduct the pilot study. This unit is a self contained, heated, 7' x 14', fully enclosed trailer. The pilot unit equipment is mounted inside the trailer, along with tools, sampling and monitoring equipment, a work area, and an inventory of supplies and materials necessary for operating the pilot unit. Setup of the pilot plant consists of securing and leveling the trailer on site, connecting the water source, discharge and electrical power. The pilot trailer can be in operation within hours of arrival.



The trailer mounted pilot unit has the capability of treating two independent flow streams of approximately 1 to 2 GPM each.



The purpose of the pilot study is to:

- Demonstrate the removal of the contaminant to below MCL standard
- Demonstrate the simplicity of operation of the WRT process
- Complete piloting requirements for regulatory approval
- Evaluate media performance



WRT personnel will deliver the trailer to the site and complete the necessary work to put the unit into operation. The Utility will need to provide a single 120VAC, 15 amp outlet, an access point for source water and a discharge point for treated water. Electrical power is connected via drop cord. The sample water inlet and treated discharge are connected to the trailer with external garden hose connections

Once the unit is in operation, WRT will instruct the operating staff with regards to the pilot unit operation and monitoring and sampling procedures. The Utility will be responsible for daily monitoring of the system, and collecting water samples and sending them to the laboratory for analysis. The number of samples and frequency of collection will be determined by WRT for each pilot study, and may change during the course of the study.

The typical length of time to complete the pilot study is 30 to 90 days.



Upon completion of the pilot test, the pilot unit and all media used during the test will be removed from the site and properly disposed of by WRT.

When the pilot test is completed and all laboratory results are received, a Pilot Study Report will be delivered to the Utility. A firm proposal will also be provided to the Utility at this time.



Appendix B
Operation Log sheet
Page 16

Uranium Removal System

Location: Grand Island, NE

Daily Operation Log

Week Of: _____

Date	Operator	Time In	Time Out	Flow Rate Actual (gpm)	Flow Rate Adjusted (gpm)	Cumulative Totalizer Flow (gal) / Comments
Mon						
Tue						
Wed						
Thu						
Fri						
Sat						
Sun						

Date	Feed Pressure	Col 1 Pressure	Col 2 Pressure	Col 3 Pressure	Col 4 Pressure	Col 5 Pressure	Col 6 Pressure	Col 7 Pressure	Col 8 Pressure	Dischg Pressure
Mon										
Tue										
Wed										
Thu										
Fri										
Sat										
Sun										



Water Remediation Technology, LLC
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Wheat Ridge, CO 80033
Ph: (303) 424-5355 • Fx: (303) 425-7497

Radiation Safety Officer:

Ted Adams

Cell: 716-725-5874

Office: 716-592-3431

tadams@wrt.net

PLEASE FAX THIS LOG
SHEET WEEKLY TO WRT

(303) 425-7497

Radiation Exposure Surveys Survey Meter: Ludlum Model 2401-P Serial Number: _____
Pre-Survey Procedures: 1. Integrity Check 2. Battery Check 3. Response Check 4. Calibration Date Check

Survey Meter Readings (mR/hr) - Do Not Subtract Background													
Date	Integrity (Y / N)	Battery (Y / N)	Response Check		Back- ground	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8
			Before	After									

Notes: _____

RESOLUTION 2009-127

WHEREAS, in 2003, a new regulation placing a Maximum Contaminate Level (MCL) on uranium in drinking water became effective: and

WHEREAS, uranium is a naturally occurring element in the aquifers of Nebraska; and

WHEREAS; the Utilities Department wishes to test a treatment process specifically designed for uranium removal; and

WHEREAS, the City of Grand Island, Utilities Department and Water Remediation Technology of Fort Collins, Colorado, desire to enter into an agreement for a Pilot Study to gain knowledge of uranium removal, with the potential to increase the margin of safety for compliance with the new regulation at the City's primary water supply source.

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND COUNCIL OF THE CITY OF GRAND ISLAND, NEBRASKA that the Mayor is hereby authorized to, on behalf of the City, to execute the Agreement for Uranium Pilot Study with Water Remediation Technology of Fort Collins, Colorado.

- - -

Adopted by the City Council of the City of Grand Island, Nebraska, June 9, 2009.

Margaret Hornady, Mayor

Attest:

RaNae Edwards, City Clerk