UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 30, 2019

Mr. Jalena Dayvault, Site Manager
U.S. Department of Energy
Office of Legacy Management
2597 Legacy Way
Grand Junction, CO 81503

SUBJECT: GUNNISON, COLORADO, PROCESSING SITE – REQUEST FOR ADDITIONAL INFORMATION RE: DRAFT GROUNDWATER COMPLIANCE ACTION PLAN

Ms. Dayvault:

By letter dated May 1, 2017, the U.S. Department of Energy (DOE) submitted the Draft Groundwater Compliance Action Plan (GCAP) for the Gunnison, Colorado, Processing Site, to the U.S. Nuclear Regulatory Commission (NRC) staff for review and comment.

The NRC staff has reviewed DOE's request and has determined that additional information and revisions are necessary for NRC to complete its review and concur on the revised GCAP. The comments and associated request for additional information are provided in the enclosure. We believe it would be of benefit to meet with you or hold a teleconference to discuss the comments and the requested information to ensure mutual understanding of the issues which must be addressed for NRC to concur on any proposed revisions to the GCAP.

In accordance with Title 10 of the *Code of Federal Regulations* Part 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of the ADAMS. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

If you have any questions concerning this letter, please contact me, either by telephone at (301) 415-0708, or by e-mail at elise.striz@nrc.gov.

Sincerely,

Elise A. Striz, Project Manager
Uranium Recovery and Materials
Decommissioning Branch
Division of Decommissioning, Uranium Recovery
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket No.: WM-00061

Enclosure:
Comments and Request for Additional
Information

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SUBJECT: GUNNISON, COLORADO, PROCESSING SITE – REQUEST FOR ADDITIONAL INFORMATION RE: DRAFT GROUNDWATER COMPLIANCE ACTION PLAN **DATE: October 30, 2019**

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COMMENTS AND REQUEST FOR ADDITIONAL INFORMATION

DRAFT GROUNDWATER COMPLIANCE ACTION PLAN

GUNNISON, COLORADO, PROCESSING SITE

DOCKET NO. WM-00061

By letter dated May 1, 2017, the U.S. Department of Energy (DOE) submitted the Draft Groundwater Compliance Action Plan (GCAP) for the Gunnison, Colorado, Processing Site, to the U.S. Nuclear Regulatory Commission (NRC) staff for review and comment (DOE, 2017). Detailed below is the additional information needed by the NRC staff to complete its review of the GCAP. Unless otherwise noted, information provided in the comments is referencing the draft GCAP.

Comment 1: DOE has proposed a uranium Alternate Concentration Level (ACL) of 1.43 mg/l for all groundwater in the alluvial aquifer underlying the original Gunnison processing site boundary, renamed as Sector 1, in lieu of the original natural flushing remedy to the applicable uranium standard of 0.044 mg/l in Table 1 to Subpart A of Title 40 of the *Code of Federal Regulations* (CFR) Part 192 (DOE, 2017). NRC staff finds that the DOE has provided sufficient evidence that the current GCAP of natural flushing is unlikely to meet the applicable uranium standard of 0.044 mg/l uranium in proposed Sector 1. This finding is also supported by the current location of the uranium plume which exceeds the applicable uranium standard of 0.044 mg/l as shown below in Figure 1.

However, NRC staff finds that DOE has not adequately addressed the present and potential hazard factors in 40 CFR 192.02 c(3)(ii)(B)(1)(iv) and (v) required for a proposed ACL. In particular, DOE has not included an evaluation of changes in groundwater use, specifically the change in location for dewatering operations at the abutting gravel operations resulting from the recent approval of the Gunnison West Gravel Pit Expansion to the new location south of the proposed Sector 1 as shown in Figure 1. The application for this gravel expansion was submitted to Gunnison County in January 2017. It was approved by Gunnison County on July 26, 2017 (Certificate of Minor Approval, Certification No. 06 Series 2017).

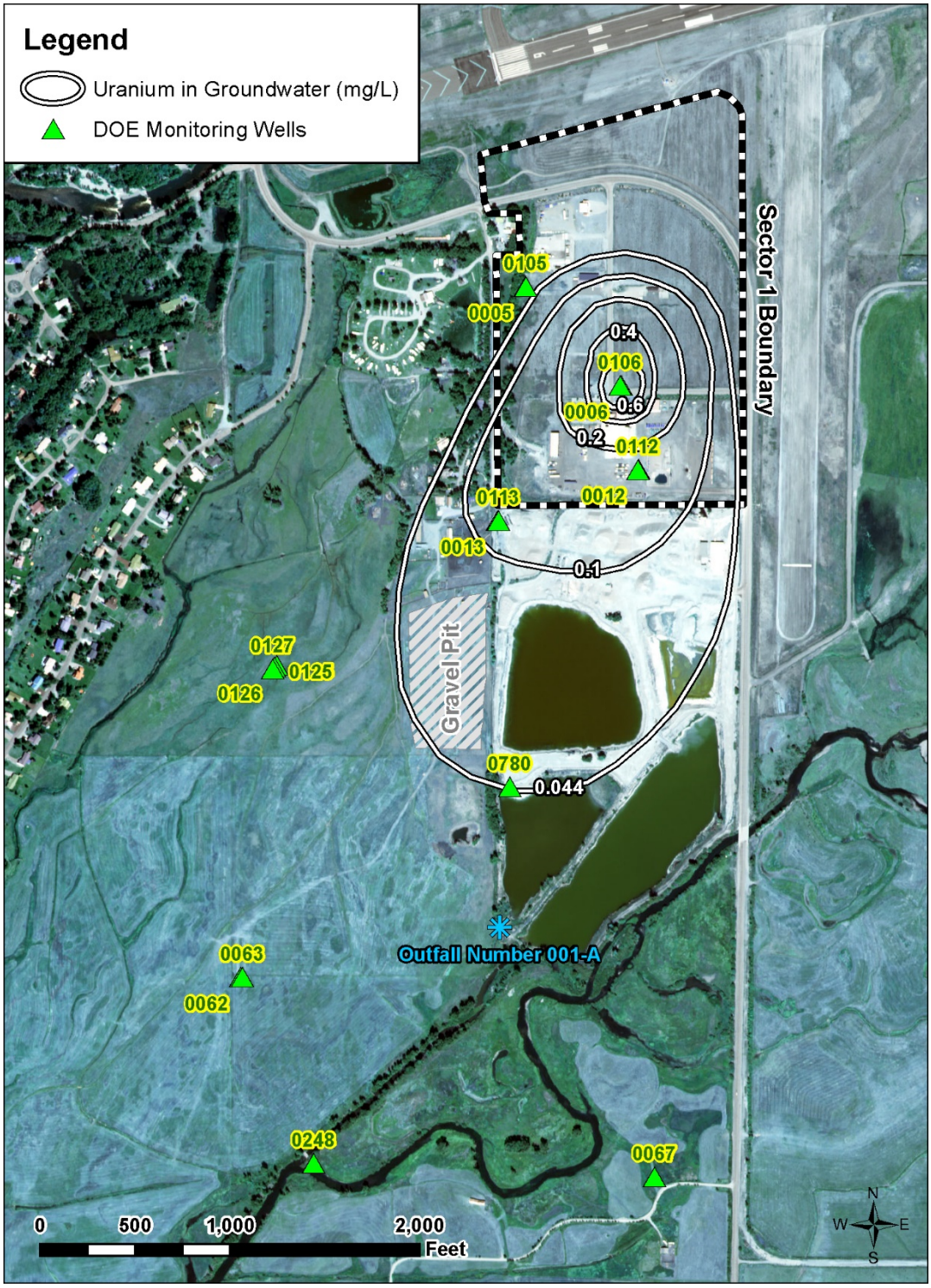

Figure 1. Uranium plume from Sector 1 and new gravel pit expansion (adapted from the 2018 Annual Verification Monitoring Report for the Gunnison Processing site Figure 2 (DOE, 2019))

Basis: The revised GCAP submitted by DOE proposes to meet the regulatory standards of 40 CFR 192, Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings, by changing the groundwater remedy from the current natural flushing remedy to achieve

the applicable maximum concentration in groundwater protection standards in Table 1 to Subpart A of 40 CFR 192 to an alternate concentration limit (ACL) strategy for uranium for Sector 1. To support an ACL, the DOE has to address the relevant present and potential hazard factors in Part 192.02 c(3)(ii)(B)(1) and (2).

NRC staff finds that DOE has not adequately addressed the present and potential hazard factors in 40 CFR 192.02 c(3)(ii)(B)(1)(iv) and (v) required for a proposed ACL by not addressing the groundwater use or analyzing the groundwater quality impacts expected from the expansion of existing gravel pit operations to a new location south of Sector 1 as shown in Figure 1. The application for this gravel expansion was submitted to Gunnison County in January 2017. The application was titled the "Gunnison West Gravel Pit Expansion" and was submitted by Oldcastle SW Group, Inc. dba United Companies as permit request LUC-17-00018. The application requested expansion of the sand and gravel operations for a new 7.5 acre gravel pit, up to 75 feet deep, directly west of the existing operational gravel pit as shown Figure 1. No other changes to the existing gravel processing operation were proposed. This permit was approved by Gunnison County on July 26, 2017 (Certificate of Minor Approval, Certification No. 06 Series 2017).

The new Gunnison West Gravel Pit Expansion operation was approved with new dewatering wells. In past gravel pit operations, dewatering wells have operated at rates up to 4000 gpm. These wells represent a new groundwater use south of the Sector 1 proposed ACL site. NRC staff finds the use of any new dewatering wells must be evaluated under present and potential hazard factors in 40 CFR 192.02 c(3)(ii)(B)(1)(iv) and (v). This evaluation is necessary to determine if and how the new gravel pit dewatering wells may impact the uranium plume and the uranium levels at the POE well MW0113 shown in Figure 1. In addition, the new dewatering wells are permitted to discharge to the "Valco Pond" gravel pit and may therefore impact the uranium levels in this gravel pond which are measured at SW0780.

Path Forward: NRC staff requests that DOE analyze the potential impact of any new gravel pit dewatering wells for the approved Gunnison West Pit Expansion. Specifically, DOE should determine if and to what extent the use of these gravel pit dewatering wells may impact the existing uranium plume shown in Figure 1 and the future uranium levels at MW0113. DOE has proposed MW0113 to be the Sector 1 POE well that will be required to meet the proposed Sector 2 ACL of 0.56 mg/l. NRC staff also requests that DOE evaluate any impact on the uranium levels measured at SW0780 in the "Valco Pond" gravel pit which will receive the dewatering well discharge from the new expansion gravel pit operation. The evaluation of this groundwater use and potential surface water impact is needed to meet the requirements of the factors in 40 CFR 192.02 c(3)(ii)(B)(1)(iv) and (v) for the proposed Sector 1 ACL.

Comment 2: NRC staff does not agree that the current GCAP of natural flushing is failing or will fail to meet the applicable uranium standard of 0.044 mg/l in the entire area of proposed Sector 2 shown in Figure 2 below. In contrast, NRC staff finds the current GCAP of natural flushing is meeting and will continue to meet the applicable uranium standards of 0.044 mg/l for almost the entire Sector 2 area, excluding the area just south of Sector 1. Therefore, NRC staff does not understand the basis for DOE to propose an ACL of 0.56 mg/l for uranium in the entirety of Sector 2 which covers 928 acres (1.45 square miles) with an aquifer thickness ranging from 70 - 130 feet thick. Assuming an average thickness of 100 feet, NRC concurrence on this proposed ACL would permanently affect over 92,800 acre feet of water and is not justified. The NRC staff are concerned with the future use restrictions to such a large area of groundwater.

Basis: The revised GCAP submitted by DOE proposes to meet the regulatory standards of 40 CFR 192, Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings, by changing from the current natural flushing remedy to achieve the applicable uranium standard to an alternate concentration limit (ACL) strategy for uranium. Specifically, DOE has proposed a uranium ACL of 0.56 mg/l for all groundwater in the alluvial aquifer underlying 928 acres of Sector 2 in lieu of natural flushing to the uranium applicable uranium standard of 0.044 mg/l.

The DOE may request ACLs for Title I sites with NRC concurrence as provided in 40 CFR 192.02(c)(3)(ii)(A) which states:

"The Secretary may apply an alternate concentration limit if after considering remedial or corrective actions to achieve the levels specified in paragraphs (c) (3) (i) (A) and (B) if this section, he has determined that constituent will not pose substantial present of potential hazard to human health and the environment as long as the alternate concentration limit is not exceeded, and the Commission has concurred."

This regulatory language makes clear that the intent is to reach either the background or applicable maximum concentration in the groundwater protection standards in Table 1 to Subpart A of 40 CFR 192. The regulation allows for DOE to propose an ACL only if the approved groundwater corrective action remedy, in this case natural flushing, has demonstrably shown that it will not meet the background level or the applicable maximum concentration in groundwater protection standards in Table 1 to Subpart A of 40 CFR 192 for the specific COC. The goal of the regulation to achieve background or groundwater protection standards in Table 1 to Subpart A of 40 CFR 192 before proposing an ACL is to preserve the aquifer water quality for all future use, unless strong compelling evidence exists that it cannot be done. This goal is typically known as ALARA, and though not specifically addressed in the 40 CFR 192.02(c)(3)(ii)(A) regulations, it is considered a goal of the groundwater remediation to meet the most protective standard possible.

NRC staff, however, finds that DOE has not provided compelling evidence that the natural flushing remedy is failing for the downgradient plume in the entire alluvial aquifer in Sector 2 and that the goal of achieving the applicable uranium standard of 0.044 mg/l should be abandoned in lieu of an ACL. In contrast, NRC staff finds the natural flushing remedy has been and continues to be successful in the majority of the alluvial aquifer in Sector 2, with no compelling evidence that all of the alluvial aquifer in Sector 2 will exceed the applicable uranium standard of 0.044 mg/l.

In Sector 2, the groundwater moves to the southwest from the original Gunnison Processing site at a yearly rate of approximately 690 to 1150 ft/year according to hydraulic conductivity and gradient values provided in the revised GCAP (DOE, 2017). As shown below in Figure 2, the uranium concentrations in the downgradient monitoring wells across Sector 2 are all below the applicable uranium standard of 0.044 mg/l with the exception of a slightly elevated uranium level at MW0183 of 0.046 mg/l.

DOE expressed agreement that uranium remains below the applicable uranium standard in Sector 2 with the following text in Section 2.4.1 "Distribution of Contamination" in the revised GCAP (DOE, 2017) which states:

Uranium is the groundwater COC at the Gunnison site, with historical concentrations measured over 2 mg/L beneath the former mill site. The highest uranium concentrations at the Gunnison site remain in the shallow groundwater under the former mill site (Figure 2). In the April 2015

sampling event, uranium concentrations exceed the UMTRCA MCL of 0.044 mg/L for groundwater in three monitoring wells on and adjacent to the former mill site and in one monitoring well (0183; deep) more than 4000 ft downgradient of the site boundary (Figure 2).

Concentrations of uranium that are less than the MCL but above background extend approximately 7000 ft downgradient of the former mill site in monitoring wells 0160 (intermediate) and 0161 (deep).

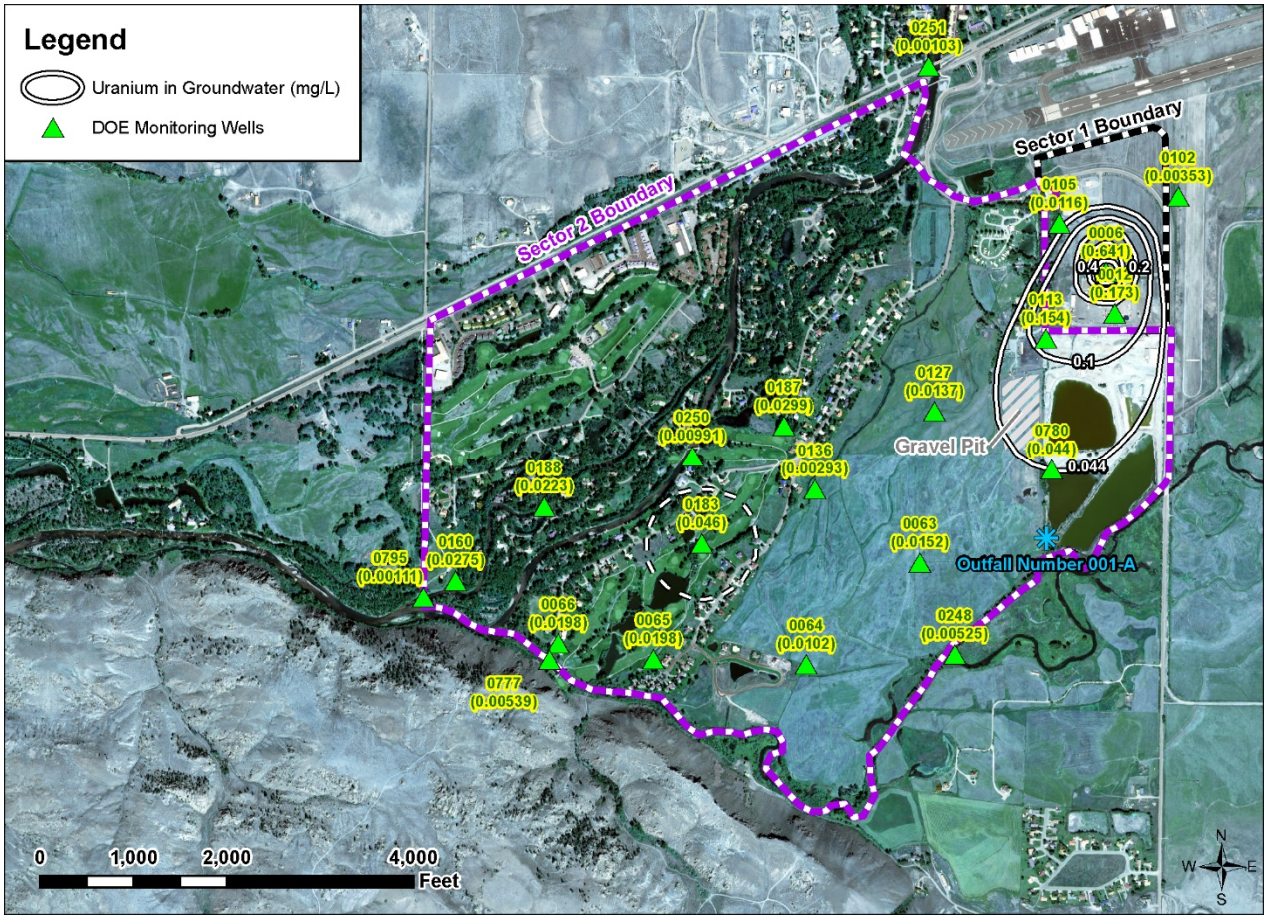

Figure 2. Uranium plume from Sector 1 and uranium in downgradient (adapted from the 2018 Annual Verification Monitoring Report for the Gunnison Processing site Figure 2 (DOE, 2019))

In addition, NRC staff's evaluation of the monitoring well data presented by DOE in the draft revised GCAP (through 2016) and independent review of all the monitoring data for uranium in Sector 2 wells (through 2019) publicly available from the DOE GEMS site for the Gunnison, Colorado Processing Site (https://gems.lm.doe.gov/#site=GUP) shows the successful performance of natural flushing to achieve the applicable uranium standard of 0.044 mg/ in the downgradient wells in Sector 2:

1. All of the downgradient DOE monitoring wells in proposed Sector 2 located at least 100 feet from the Sector 1 boundary, with the exception of MW0183, have been historically and continue to be at or substantially below the applicable uranium standard of 0.044 mg/l as shown in Figure 11 of the revised GCAP (DOE, 2017) and Plots 2, 3, and 4 of the 2018 Annual Verification Monitoring Report (DOE, 2019).

2. None of the downgradient DOE monitoring wells in proposed Sector 2, located at least 100 feet from the Sector 1 boundary, show any trends which demonstrate that any well will exceed the applicable uranium standard of 0.044 mg/l in the future as shown in Figure 11 of the revised GCAP (DOE, 2017) and Plots 2, 3, and 4 of the 2018 Annual Verification Monitoring Report (DOE, 2019).
3. Of the downgradient monitoring wells in proposed Sector 2,located at least 100 feet from Sector 1 boundary, only one, MW0183, has exceeded the applicable uranium standard historically as shown in Figure 11 of the revised GCAP (DOE, 2017) and Plot 3 of the 2018 Annual Verification Monitoring Report (DOE, 2019).
4. NRC staff review of the most recent uranium data in MW0183 from 2017-2019 shows it has declined close to the applicable uranium standard and is at 0.046 mg/l. DOE reported that the uranium levels in MW0183 exhibit “no trend” in Table 4 of the 2015 Annual Verification Monitoring Report (DOE, 2016).
5. All of the five buffer zone domestic wells which are still being used for drinking water west of the Gunnison River have been and continue to be monitored by DOE. These domestic wells have historically been and continue to be substantially below the applicable uranium standard of 0.044 mg/l uranium as shown in Plot 9 of the 2018 Annual Verification Monitoring Report (DOE, 2019).
6. None of the five buffer zone domestic wells that are still being used for drinking water in proposed Sector 2 show any trends which demonstrate that any well will exceed the applicable uranium standard of 0.044 mg/l uranium as shown in Plot 9 of the 2018 Annual Verification Monitoring Report (DOE, 2019).
7. MW0160 and MW0161, the farthest downgradient monitoring wells, are located approximately 7000 feet away from the former processing site. These wells have been and continue to be below the 0.044 mg/l applicable uranium standard, demonstrate no current trend and are not expected to exceed the uranium standard as shown in Plot 4 of the 2018 Annual Verification Monitoring Report (DOE, 2019).

In its review, NRC staff found that DOE based the increasing trend in uranium and therefore failure of the natural flushing remedy in all of Sector 2 mostly on one well, MW0113, which lies immediately adjacent to the southwest corner of the original processing site as shown in Figure 1. DOE showed this upward trend as a deviation from the predicted natural flushing model in Figure 4 of the draft GCAP (DOE, 2017).

NRC staff’s independent review of the monitoring well data for MW0113 is shown in Figure 3 below. The uranium levels in this well showed a significant decrease in uranium from 0.56 mg/l to 0.081 mg/l, from 1985 to 2007. The well then displayed a mild increasing trend up to 0.23 mg/l uranium from 2008 to 2014. However, from 2015 to 2019, the MW0113 data shows the upward trend in uranium has reversed and is now stable around 0.15 mg/l uranium as shown in Figure 3. In addition, the NRC staff’s review of wells immediately downgradient of MW0113 showed this increase was not reflected in the downgradient wells, even though it was present for seven years. Specifically, MW0126 and MW0127, also shown on Figure 3, are the closest wells located 1039 feet directly downgradient of MW0113. These wells show significant decreasing trends with natural flushing in Figure 4 and have remained significantly below the 0.044 mg/l uranium standard since 1998. NRC staff review of these wells and of all other downgradient wells in Sector 2 indicate that the anomalous increase in MW0113 was naturally attenuated as predicted and did not impact downgradient wells.

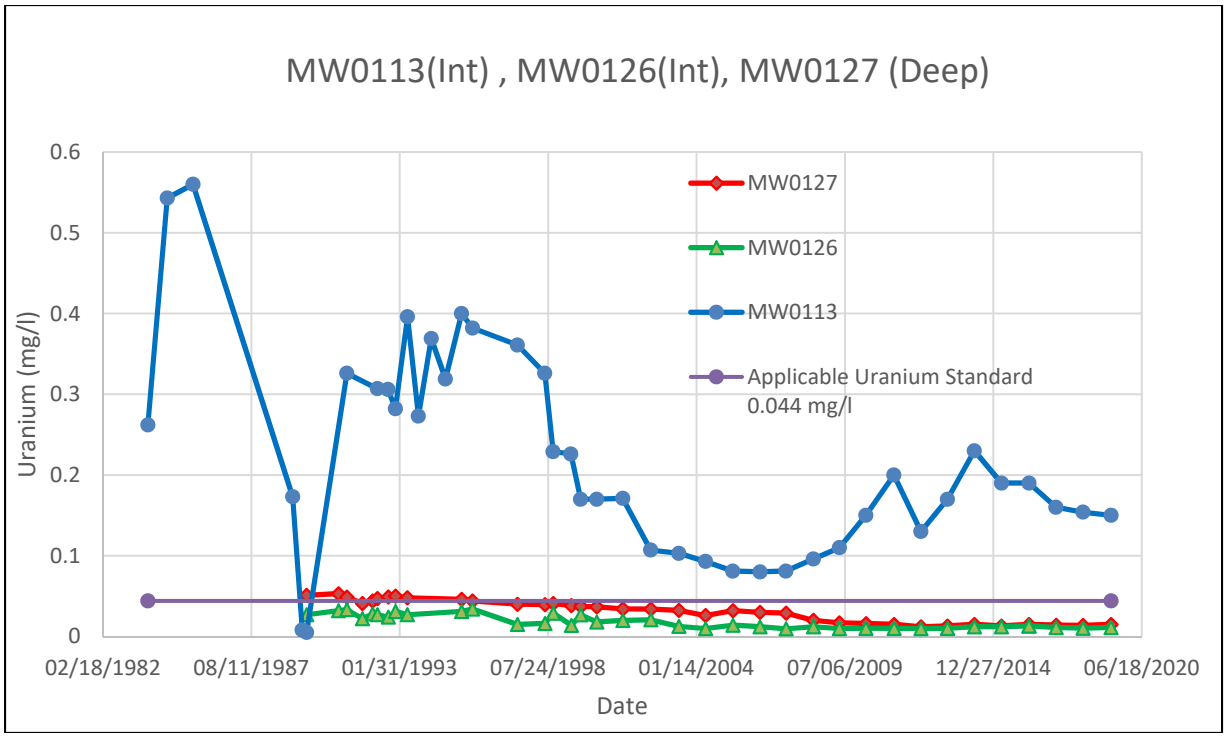

Figure 3. Uranium levels in MW0113, MW0126 and MW0127 vs. applicable uranium standard (0.044 mg/l)

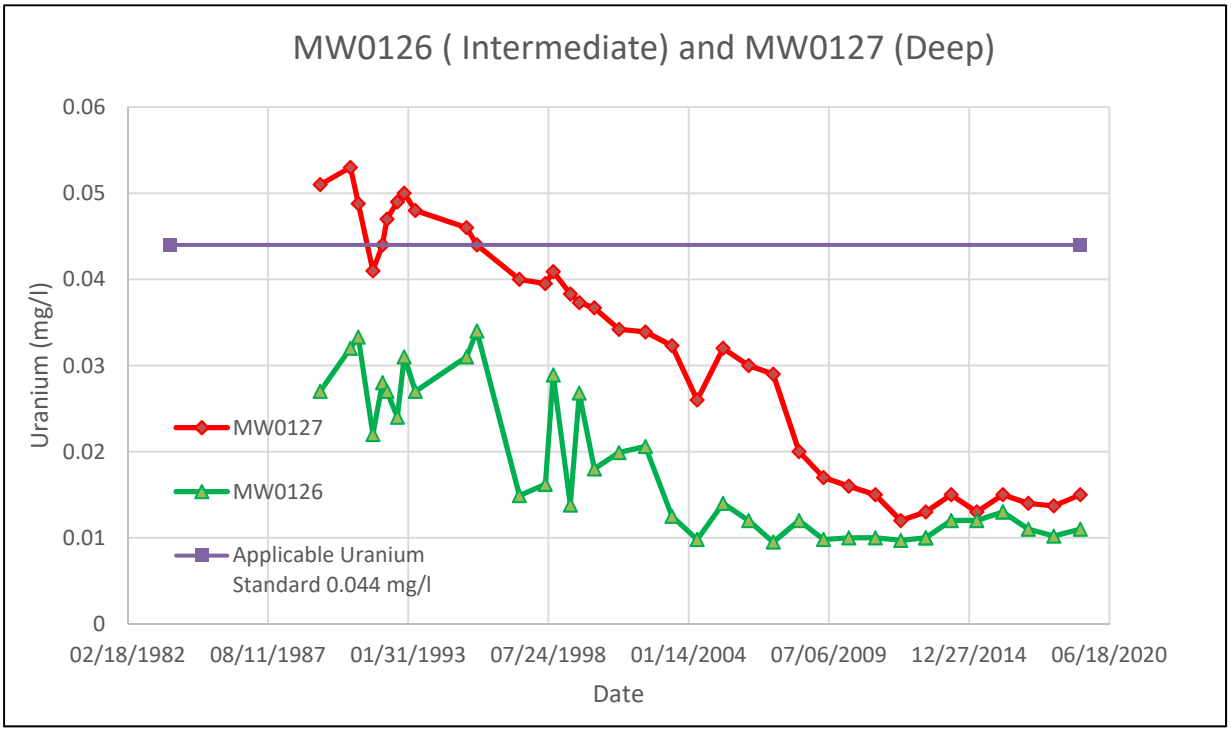

Figure 4. Uranium levels in MW0126 and MW0127 vs. applicable uranium standard (0.044 mg/l)

In addition to these findings, DOE, as quoted below in Appendix C4.5 of the draft GCAP (DOE, 2017), stated that the downgradient plume from the processing site is stable with only one downgradient well showing an exceedance of the appropriate uranium standard. Specifically, DOE agreed that the uranium on the Sector 1 processing site is persistent and elevated, but the downgradient uranium plume located in the proposed Sector 2 is stable or shrinking and remains below the "MCL" (applicable uranium standard) in all but one well:

C4.5 ALARA Demonstration
Because of the high uranium concentrations observed in onsite groundwater in the past and the residual uranium that remains in site soils, elevated levels of uranium are likely to persist for the foreseeable future. Most contamination is confined to the site, which is owned by the local government. The quitclaim deed for the site requires that the site remain in government ownership and that groundwater at this site is not used for any purpose. The plume appears to be stable or shrinking. Given current and likely site uses and the available supply of water, ALARA concentrations have been achieved in groundwater. Only one monitoring well downgradient of the immediate site vicinity has uranium concentrations above the MCL.

NRC staff believes this well is presumably MW0183 which is currently at 0.046 mg/l uranium, an exceedance of only 0.002 mg/l from the applicable uranium standard.

NRC staff finds that the only well in Sector 2 that had a brief increasing trend of concern was MW0113 located in the far northeastern border of Sector 2 on the southwestern corner of the original Gunnison processing site identified as Sector 1. NRC staff found the increasing trend in uranium in the MW0113 has reversed and is now declining. In addition, NRC staff finds this well is immediately adjacent to the original processing site and is therefore not representative of all the downgradient wells in Sector 2 which remain substantially below the applicable uranium standard of 0.044 mg/l. NRC staff finds this well is not representative of the entire Sector 2 downgradient water quality and is not impacting downgradient wells. It should therefore not be used as the main basis to propose an ACL for Sector 2.

Finally, DOE did not provide any additional revised groundwater modeling or other analysis in the revised GCAP that demonstrated that the applicable uranium standard will be exceeded downgradient in the alluvial aquifer or surface water to justify the proposed ACL of 0.56 mg/l uranium for the entire alluvial aquifer in proposed Sector 2.

NRC staff therefore concludes that the proposed ACL for Sector 2 is not justified and is not needed as the GCAP natural flushing remedy is successful for the downgradient plume. Approval of the proposed Sector 2 ACL would unnecessarily and permanently remove all of the groundwater in the alluvial aquifer from its potential future uses including as a domestic water source. It would also require that DOE provide new durable and enforceable institutional controls (IC) to permanently remove all currently installed wells from domestic use. The current institutional control of a New Domestic Well Constraint Special Area provided in Appendix B of the draft GCAP is not sufficient as it only prevents new domestic wells from being installed (DOE, 2017). If NRC were to concur on an ACL of 0.56 mg/l uranium, it would require a new IC that would also prevent currently installed wells being used for domestic water supply in the future or as they are now west of the Gunnison River. Obtaining a durable and enforceable institutional control preventing all domestic water use (e.g. quit claim deed or environmental covenant for each property) would be difficult and time consuming.

NRC staff concludes that the vast majority of downgradient monitoring wells in the proposed Sector 2 have and continue to demonstrate that the current natural flushing remedy to achieve and maintain the applicable uranium standard of 0.044 mg/l has been and will continue to be successful. NRC staff finds that the downgradient monitoring well data do not show any trends that will exceed the applicable uranium standard of 0.044 mg/l/ over the 100 year natural flushing time frame. Therefore, NRC cannot concur on the proposed ACL of 0.56 mg/l for the currently proposed Sector 2.

Path Forward: NRC staff requests that DOE should withdraw the proposed ACL for all of Sector 2 and maintain the natural flushing remedy to maintain the groundwater protection standard of 0.044 mg/l uranium to meet the groundwater protection standard as specified in paragraphs 40 CFR Part 192.02(c) (3) (i) (A) and (B).

If DOE chooses to withdraw the proposed ACL of 0.56 mg/l uranium for all of Sector 2, NRC staff requests that the DOE propose a revised Sector 2 with an ACL as described in Comment 3 below.

Comment 3: NRC staff requests that DOE propose a revised Sector 2 from the southern boundary of Sector 1 down to Tomichi Creek to include MW0113, the entire gravel pit operation and newly approved Gunnison West gravel pit expansion. An example of such a revised Sector 2 is shown in Figure 5 below. NRC staff finds there is compelling evidence that the alluvial groundwater in this revised Sector 2 will not achieve the uranium applicable standard of 0.044 mg/l in 100 years by natural flushing and therefore a proposed ACL of 0.56 mg/l derived from MW0113 historical uranium values is appropriate.

Basis: NRC staff finds that the proposed ACL of 0.56 mg/l uranium would be reasonable over a revised Sector 2 area extending south from the boundary of Sector 1 to Tomichi Creek and encompassing MW0113 and the new gravel pit operation to the west. An example of a revised Sector 2 area is shown in Figure 5 below.

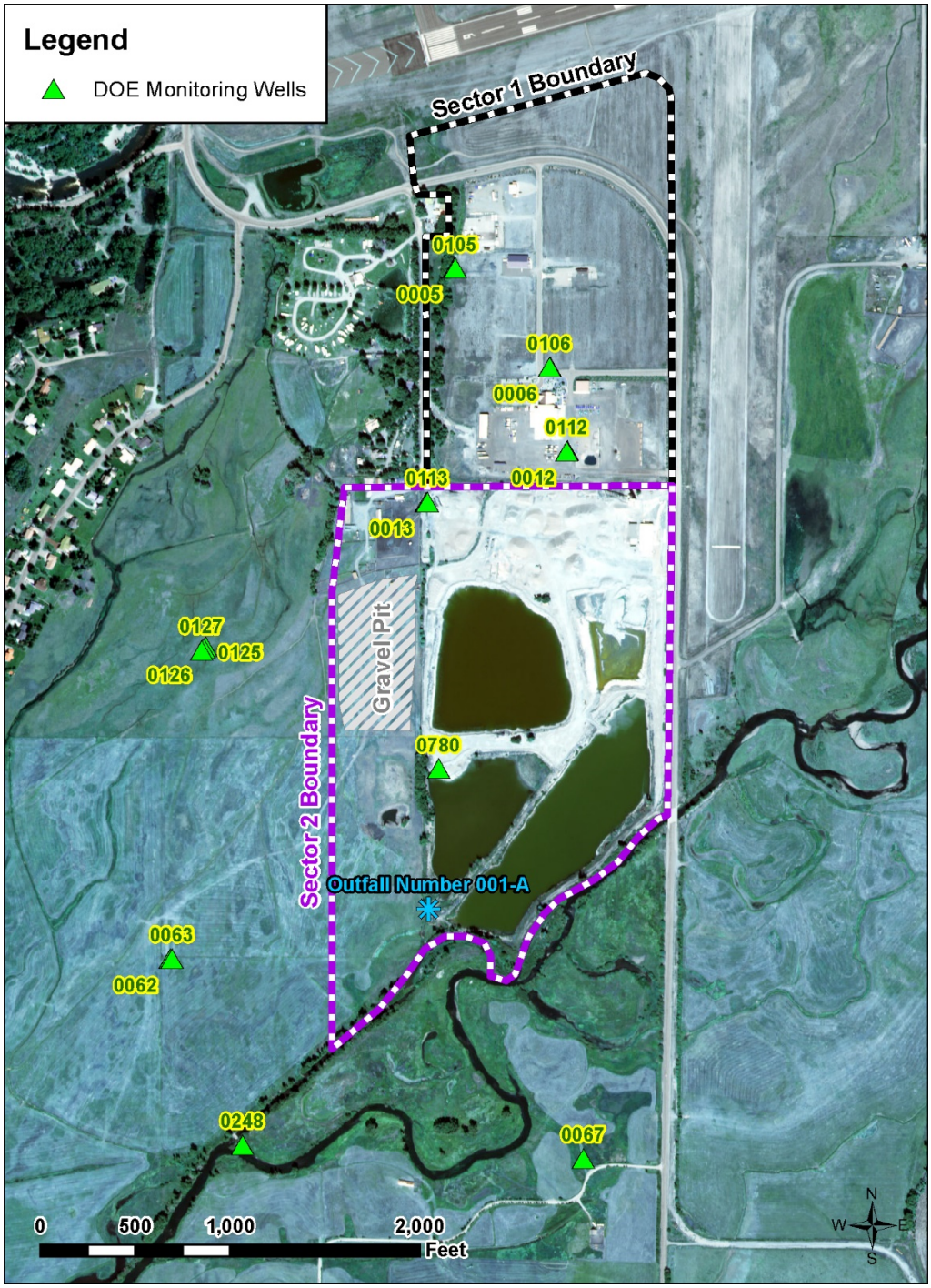

Figure 5. Example of revised Sector 2 (purple boundary) for proposed ACL (adapted from the 2018 Annual Verification Monitoring Report for the Gunnison Processing site Figure 2 (DOE, 2019))

NRC staff finds that in an appropriately revised Sector 2, the proposed ACL is justified for the following reasons:

1. The concentration of uranium in MW0113 has remained significantly above the applicable uranium standard as shown in Figure 3.

2. DOE has reported that there is a southern uranium plume located in this area as shown in Figure 1 with uranium levels that remain above the applicable uranium standard of 0.044 mg/l (DOE, 2019).
3. The size and behavior of the southern uranium plume in this revised Sector 2, including its probable exceedance of the applicable uranium standard of 0.044 mg/l over the 100 year natural flushing period, was predicted by the Site Observational Work Plan (SOWP) groundwater flow and uranium transport modeling (DOE, 2001).
4. The uranium levels in SW0780 over time at the "Valco Pond" gravel pit within this revised Sector 2 have been below the applicable uranium standard of 0.044 mg/l but are now increasing above it as shown in Figure 6 below.
5. The discharge of gravel pit dewatering water from the recently approved gravel pit expansion is likely to pull the uranium plume to the south from Sector 1 within this revised Sector 2. The discharge may increase the uranium levels in "Valco Pond" gravel pit.

Path Forward: NRC staff requests that DOE should reduce the Sector 2 area for the proposed ACL of 0.56 mg/l uranium to a revised Sector 2 area similar to the one shown in Figure 5 based on DOE's own assessment.

Comment 4: NRC staff requests that if DOE proposes the recommended revised Sector 2 for a proposed ACL of 0.56 mg/l, the POC well for revised Sector 2 should be MW0113. This well should also act as the POE for Sector 1.

Basis: NRC staff agrees with the DOE analysis of the Upper Simultaneous Limit (USL) in MW0113 in the revised GCAP and that an ACL of 0.56 mg/l is appropriate for this well. The SOWP groundwater flow and uranium transport modeling and historical monitoring values show MW0113 will experience the highest uranium values in a revised Sector 2 region given its proximity to Sector 1 (DOE, 2001). It is therefore appropriate to select MW0113 as the POC well for the entire recommended revised Sector 2 proposed ACL.

Path Forward: DOE should identify MW0113 as the POC well for a revised Sector 2 with a proposed ACL of 0.56 mg/l. MW0113 will continue to act as the POE for Sector 1 proposed ACL of 1.43 mg/l uranium.

Comment 5: NRC staff requests that if DOE proposes the recommended revised Sector 2 for a proposed ACL of 0.56 mg/l, the POE locations for a revised Sector 2 should be MW0125, MW0126, MW0127 and MW0062 and MW0063. NRC staff also requests that the surface water POEs for a revised Sector 2 be SW0780 on the "Valco Pond" gravel pit and SW0248 on Tomichi Creek.

Basis: The NRC staff requests these POE well and POE surface water monitoring locations shown on Figure 5 for the following reasons:

1. POE groundwater wells and surface water locations must be close to and outside of the boundary of the proposed ACL region because these are the locations where the potential receptor may be exposed.
2. POE groundwater wells and surface water locations should be located near the proposed ACL boundary to trigger corrective action if uranium levels are exceeded and to prevent any downgradient receptor from being impacted.
3. SW0780 is appropriate as a surface water POE for an appropriately revised Sector 2 ACL because the "Valco Pond" gravel pit is used for recreational fishing (DOE, 2002).

4. SW0780 is appropriate as a surface water POE because the “Valco Pond” gravel pit directly discharges to Tomichi Creek at the surface water discharge outfall (Outfall 001A in Figure 2) under CDPS Certification Number COG500010 (CDPHE, 2016).
5. SW0248 is appropriate as a surface water POE for an appropriately revised Sector 2 ACL because Tomichi Creek is designated as a water supply stream and must meet the applicable uranium standard of 0.044 mg/l.
6. SW0248 is appropriate as a surface water POE because it has been consistently below the applicable uranium standard of 0.044 mg/l as shown in Figure 6 below.
7. SW0248 is appropriate as a surface water POE as it is directly downstream of the CDPS surface water discharge outfall (Outfall 001A in Figure 2). This outfall allows direct discharge of uranium contaminated water from the “Valco Pond” gravel pit to Tomichi Creek (CDPHE, 2016).
8. MW0125, MW0126, and MW0127 are appropriate for POE wells for a revised Sector 2 as they are the closest wells located west and downgradient of the revised Sector 2 ACL region and have remained historically below the uranium MCLs. These wells are also in an area that may continue to exceed the applicable uranium standard past the 100 year natural flushing period as predicted by the DOE groundwater flow and uranium transport modeling in the SOWP (DOE, 2001).
9. MW0062 and00623 are appropriate as POE wells for a revised Sector 2 as they are the closest wells located southwest and downgradient of the revised Sector 2 and have remained historically below the applicable uranium standard. These wells are also in an area that may continue to exceed the applicable uranium standard past the 100 year natural flushing period based on the DOE groundwater flow and uranium transport modeling in the SOWP (DOE, 2001).
10. MW0062 and MW0063 are also appropriate as POE wells for Sector 2 as they are well positioned to detect any seepage of uranium from the “Valco Pond” gravel pit that might be missed by MW0126 and MW0127 based on predictions provided by the DOE groundwater flow and uranium transport modeling in the SOWP (DOE, 2001).
11. All of the recommended groundwater POE and surface water POE are located in areas closest to the revised Sector 2 boundary which will enable timely detection of an exceedance of the applicable uranium standard to trigger corrective action if needed.

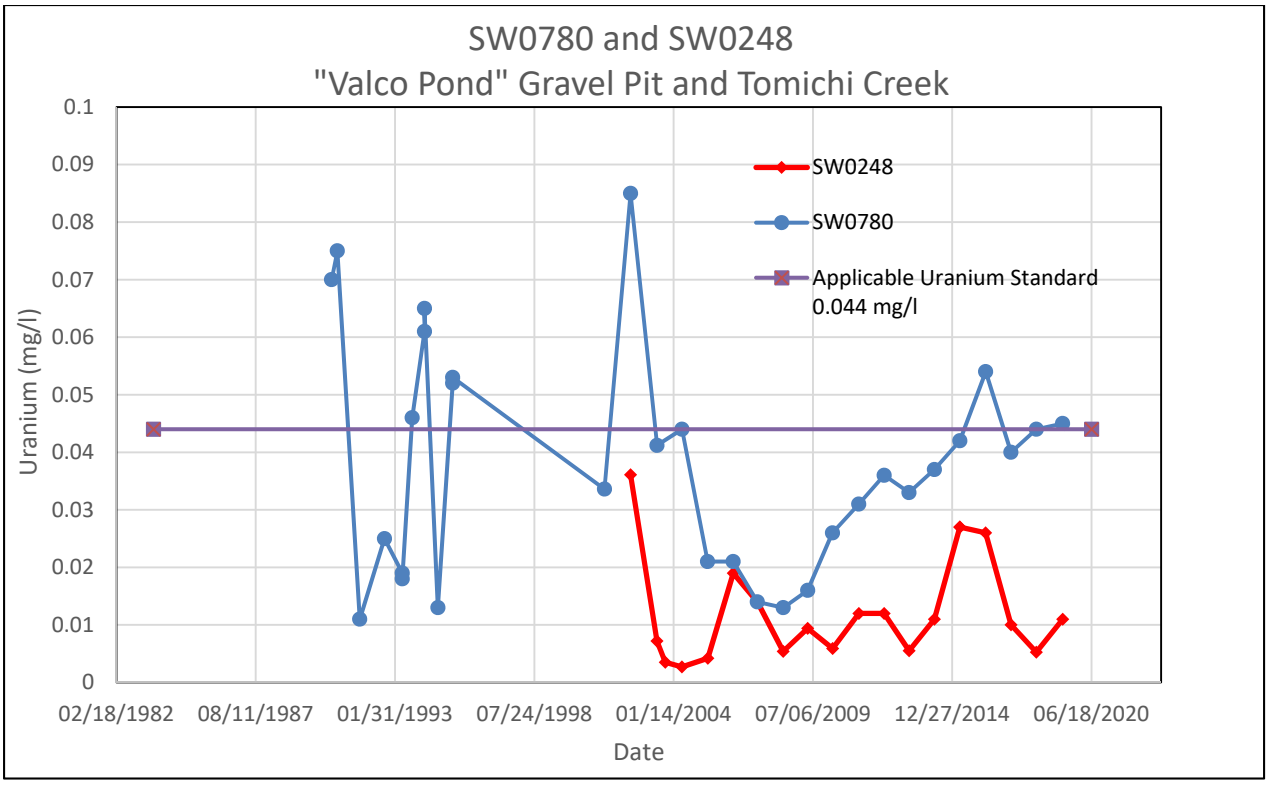

Figure 6. Uranium levels in SW0248 and SW0780 vs. applicable uranium standard (0.044 mg/l)

Path Forward: NRC staff requests that DOE selects the groundwater well POE locations to be MW0125, MW0126, MW0127 and MW0062 and MW0063 and the surface water POEs to be SW0780 on the 'Valco Pond" gravel pit and SW0248 on Tomichi Creek for an appropriately revised Sector 2.

Comment 6: NRC staff finds that there are no POE wells outside of the institutional control (IC) boundary directly south of the gravel pit operation in revised Sector 2 (Figure 5). A POE well is needed south of this IC boundary to monitor and ensure that unrestricted groundwater use will not pose a substantial present or potential hazard to human health and the environment.

Basis: The draft GCAP submitted by DOE proposes to meet the regulatory standards of 40 CFR 192, Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings, by changing from a natural flushing strategy for contaminants of concern (COCs) to a proposed ACL for Sector 2. Approval of an ACL requires an assessment to determine that levels of contaminants will not pose a substantial present or potential hazard to human health and the environment. 40 CFR 192.02 (c)(3)(ii)(B)(1), specifies that an evaluation of potential hazards from proposed ACLs must consider several factors, including potential adverse effects on groundwater quality. This includes the proximity and withdrawal rates of groundwater users.

NRC staff finds groundwater must be suitable for unrestricted use downgradient of a revised Sector 2 as there are no ICs beyond this boundary. DOE measured uranium concentrations in private domestic wells MW0080, MW0081, and MW0082 just south of the Sector 2 gravel pit boundary in the past. Some of the uranium measurements in these domestic wells were elevated relative to background, but below the applicable uranium standard of 0.044 mg/l. In 2005, DOE installed MW0067 shown on Figure 5 to verify elevated uranium concentrations measured in

private domestic well MW0082 were representative. DOE monitored MW0067 for four years as shown in Figure 7 below.

DOE has not provided any uranium measurements in MW 0067 since 2008. To concur on an ACL for the recommended revised Sector 2, NRC staff must have an analysis that demonstrates that domestic groundwater users south of the IC boundary for a revised Sector 2 will not be exposed to uranium levels above the applicable standard of 0.044 mg/l.

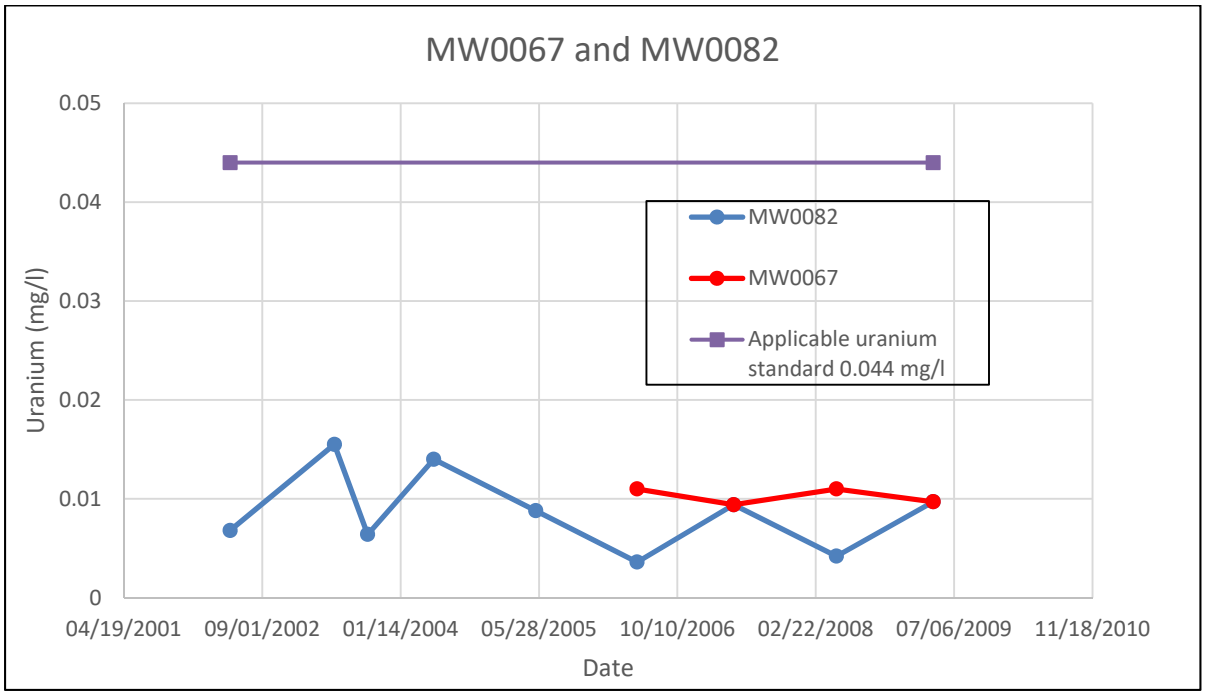

Figure 7. Uranium Trend in MW0067 and MW0082 vs. Applicable uranium standard (0.044 mg/l)

Path Forward: NRC staff requests that DOE provide an analysis to support the conclusion that uranium concentrations in the alluvial aquifer will not exceed the applicable uranium standard of 0.044 mg/l beyond the IC boundary south of the gravel pit operations in a revised Sector 2. This information should include updated modeling with recent site monitoring data as well as additional groundwater monitoring data beyond the IC Boundary to the south and west of the former processing site in Sector 1. NRC staff also requests that DOE add a POE well, such as MW0067, if it still exists or install a new POE well in this area to verify that the proposed ACL for Sector 2 is protective of private well users.

Comment 7: NRC staff finds that DOE has not adequately addressed the impact of the discharge from the "Valco Pond" gravel pit on the uranium levels in Tomichi Creek from the change in groundwater use described in Comment 2. NRC staff has determined that the "Valco Pond" gravel pit has been and is currently permitted by Colorado Department of Public Health and Environment (CDPHE) to directly discharge to Tomichi Creek at the surface water discharge Outfall 001A as shown in Figure 2 under CDPS Certification Number COG500010 (CDPHE, 2016). Specifically, DOE has not evaluated how this change in groundwater use from the approved new gravel pit expansion and associated dewatering wells which are permitted to discharge to the "Valco Pond" gravel pit may increase the uranium levels in Tomichi Creek which is designated as a water supply stream. As a water supply stream, Tomichi Creek must be

shown to meet the applicable uranium standard of 0.044 mg/l for NRC concurrence on a Sector 2 proposed ACL.

Basis: The DOE must address the present and potential hazard factors in 40 CFR 192.02 c(3)(ii)(B)(1)(iv) and (v) 192.02 c(3)(ii)(B)(2)(v), (vi) and (vii), which respectively address potential adverse effects on groundwater and surface water for a proposed ACL in a revised Sector 2. In particular, DOE has not included the change in groundwater use or addressed the effect of this groundwater use change resulting from the recent approval of the Gunnison West Gravel Pit Expansion to the new location south of the proposed Sector 1 as shown in Figure 1 on uranium levels in Tomichi Creek. The application for this gravel expansion was submitted to Gunnison County in January 2017. It was approved by Gunnison County on July 26, 2017 (Certificate of Minor Approval, Certification No. 06 Series 2017).

Path Forward: NRC staff requests that DOE provide an analysis that demonstrates that uranium levels in the "Valco Pond" gravel pit anticipated from the change in groundwater use from the approved gravel pit expansion and associated dewatering wells which are permitted to discharge to the "Valco Pond" and then directly to Tomichi Creek at CDPS Outfall 001A are not likely to increase the uranium levels in Tomichi Creek above the applicable uranium standard of 0.044 mg/l.

Comment 8: DOE has incorrectly identified the State of Colorado surface water quality uranium standards for a water supply stream in the reference to Tomichi Creek on the bottom of page 9 in the draft GCAP (DOE, 2017).

Basis: In consultation with CDPHE, NRC staff has determined that the correct State of Colorado uranium surface water quality standards for a water supply stream in this portion of the Gunnison River Basin are found in Regulation No. 35 - "Classifications and Numeric Standards for Gunnison and Lower Dolores River Basins." Section 35.5(3)(c) of this document states:

In no case shall uranium levels in waters assigned a water supply classification be increased by any cause attributable to municipal, industrial, or agricultural discharge so as to exceed 16.8 - 30 ug/l or naturally-occurring concentrations (as determined by the State of Colorado), whichever is greater.

Path Forward: NRC staff requests that DOE correct the reference to the State of Colorado uranium surface water quality standards for Tomichi Creek on the bottom of page 9 of the draft GCAP (DOE, 2017).

Comment 9: If DOE proposes a uranium ACL for a revised Sector 2 as recommended by NRC, DOE should provide an updated list of all private wells and or industrial wells and their current use in this revised Sector 2.

Basis: NRC staff finds that DOE has not adequately addressed the present and potential hazard factors in 40 CFR 192.02 c(3)(ii)(B)(1)(iv) and (v) required for a proposed ACL in a revised Sector 2. In particular, DOE has not provided an updated list of private and industrial wells and their current use in a revised Sector 2.

Path Forward: DOE should provide an updated list of all existing private or industrial wells and their current use in a revised Sector 2.

Comment 10: DOE has not provided an updated environmental review of the proposed action for the draft GCAP (DOE, 2017) or an amendment to the Gunnison, Colorado, UMTRA Project Site Environmental Assessment (DOE, 2002). The NRC has determined that its action, specifically concurrence on DOE's revised GCAP, requires an appropriate review under the National Environmental Policy Act (NEPA). NRC must therefore conduct consultations including those satisfying Section 106 of the Nation Historic Preservation Act (NHPA) and Section 7 of the Endangered Species Act (ESA).

Basis: Although not specifically stated in the draft GCAP (DOE, 2017), it is NRC's understanding that DOE has determined that its action (i.e., revising the GCAP from natural flushing to ACLs) meets the criteria for an established categorical exclusion. On the other hand, NRC's action (i.e., concurrence on DOE's revised GCAP) does not meet the criteria for one of its categorical exclusions and thus NRC will be performing an appropriate environmental assessment resulting in an Environmental Assessment or an Environmental Impact Statement. In addition, NRC staff will be completing the requisite consultations including those satisfying Section 106 of the Nation Historic Preservation Act (NHPA) and Section 7 of the Endangered Species Act (ESA).

Path Forward: NRC staff requests that to minimize duplicative consultation efforts that DOE may have already performed, DOE should please provide any information on any consultations that DOE has performed for Section 106 of the NHPA or Section 7 of the ESA for the draft GCAP (DOE, 2017a). NRC staff also requests that DOE provide any relevant information from consultations with any other stakeholders including the National Park Service, Colorado Department of Public Health and Environment (CDPHE), and Gunnison County with respect to the draft GCAP (DOE, 2017).

References

1. CDPHE, 2016, "Certificate to Discharge Under CDPS Permit COG500000, Discharges Associated with Sand and Gravel Mining and Processing," November 16, 2016.

2. DOE, 2001, "Final Site Observation Work Plan for the Gunnison, Colorado UMTRA Project Site (LMS/GUP/S06004), Office of Legacy Management, Grand Junction, CO, March 2001 (ADAMS Accession Nos. ML016172022 and ML061720024).

3. DOE, 2002, "Environmental Assessment of Ground Water Compliance at the Gunnison, Colorado UMTRA Project Site," DOE /EA-1399, July 2002 (ADAMS Accession No. ML061670211).

4. DOE, 2010, "Final Groundwater Compliance Action Plan for the Gunnison Colorado Processing Site (LMS/GUP/S06004)," Office of Legacy Management, Grand Junction, CO, April 2010 (ADAMS Accession No. ML101200599).

5. DOE, 2016, "2015 Annual Verification Monitoring Report ,Gunnison, Colorado, Processing Site, (LMS/GUP/S06004)" Office of Legacy Management, Grand Junction, CO, June 2016 (ADAMS Accession No. ML16168A045).

6. DOE, 2017, "Draft Groundwater Compliance Action Plan for the Gunnison, Colorado, Processing Site (LMS/GUP/S06004)," Office of Legacy Management, Grand Junction, CO, April 2017 (ADAMS Accession No. ML17124A592).

7. DOE, 2019, “2018 Annual Verification Monitoring Report, Gunnison, Colorado, Processing Site (LMS/GUP/S06004),” Office of Legacy Management, Grand Junction, CO, June 2019 (ADAMS Accession No. ML19025A086).