ENTERED

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH WING (AETC)
HOLLOMAN AIR FORCE BASE
NEW MEXICO

22 June 2021

ADAM M. KUSMAK, GS-13, USAF
Chief, Installation Management Flight (49 CES/CEI)
49th Civil Engineer Squadron (49 CES)
Holloman Air Force Base, NM 88330

Mr. Kevin Pierard
Chief, Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East Bldg. 1
Santa Fe, NM 87505-6063

SUBJECT: **RESPONSE LETTER TO REQUEST FOR SUPPLEMENTAL INFORMATION – SITE RW-042 (RADIOACTIVE WASTE DISPOSAL AREA, SWMU 111) WASTE DISPOSAL NOTIFICATION LETTER (MAY 6, 2021)**
HOLLOMAN AIR FORCE BASE
EPA ID# NM6572124422
HWB-HAFB-18-009

Dear Mr. Pierard,

On May 11, 2021, Holloman Air Force Base (AFB) received a letter from the New Mexico Environment Department (NMED): Request for Supplemental Information, Site RW-042 (Radioactive Waste Disposal Area, Solid Waste Management Unit [SWMU] 111) Waste Disposal Notification Letter (Request Letter) (May 6, 2021). Holloman Air Force Base (AFB) has reviewed the Request Letter and respectfully disagrees that the four specific issues identified provide reasonable justification for updating the data or risk assessment provided in the RW-042 Interim Measures (IM) Report.

The IM Report was twice approved with modifications by NMED (October 31, 2018 and October 2, 2019, **Attachment 1**). Holloman AFB has addressed NMED's conditions of approval with submittal of the Disposal Notification Letter (January 19, 2021).

Detailed responses to NMED's four specific comments in the Request for Supplemental Information letter are provided in matrix form in **Attachment 2**, with additional summary below. As described in the detailed responses, the following findings apply:

1. None of the metals in question are suspected contaminants of concern (COCs) at the Site.
2. Groundwater standards are not applicable for risk assessment at the Site due to elevated naturally occurring total dissolved solids (TDS) concentrations (12,000 to 13,000 mg/L).
3. There would be no adverse risk from selenium or antimony even if they had been detected at their respective limit of detection (LOD) concentrations.
4. Arsenic and thallium are found at levels consistent with background values at Holloman AFB. Both were quantitatively demonstrated to be below groundwater standards using dissolved fraction samples and both had higher concentrations in the up-gradient (background) monitoring well.

5. Any risk attributable to thallium at the Site would be considered a naturally occurring elevated risk. The noted elevated LODs in soil samples for thallium and arsenic do not impact risk assessment at the Site. In numerous cases, arsenic samples had detection limits below the R-SSL value (7.07 mg/kg), and samples with detected arsenic concentrations between the detection limit (DL) and the LOD would have been reported (with "F" flags). Thallium was not detected at the Site in the current IM Report, in the previous ACM Report (Bhate, 2012) with LODs as low as 1.3 mg/kg, or in the Basewide Background Study (NationView/Bhate, 2011). Nevertheless, thallium was statistically assigned a 95% upper tolerance limit of 1.3 mg/kg in the Basewide Background Study, which exceeds the R-SSL (0.78 mg/kg).
6. The uncertainty associated with issues described in the Request Letter have no impact on the findings or recommendations of the RW-042 IM Report.

Summary

Historical operations at Site RW-042 (Site) included excavation with a large auger and burying of 4 concrete cylinders (or plugs) (21 inches in height x 21 inches in diameter), backfilling the excavation with removed native soils, and placing a concrete monument over the buried plugs. The concrete plugs were buried in the 1950s in this fashion based on Air Force practices (Technical Order TO 00-110A-1) and included concrete encasement (with the waste items cast-in-place) of used electronic components (dials, tubes, etc.) containing Cobalt-60. When excavated in 2019, the plugs were in good structural condition and maintained containment integrity based on results of concrete samples and surface swipe samples. Based on x-rays, the encased parts were deep within the cylinders with ample concrete cover on all sides. Inorganic metals in soil or groundwater are not suspected COCs for Site RW-042.

NMED has requested additional lines of evidence regarding four metals that are not suspected contaminants linked to past Site operations. Several of the NMED comments referenced Reporting Limits (RLs). The RW-042 IM Report tables do not specifically list RLs, rather, it used the terminology of LODs, which is a similar concept to RLs (see further definitions in **Attachment 2**). In the data results presented, "F" flagged results are provided for detections between the DL and the limit of quantitation (LOQ); therefore, it is appropriate to compare the laboratory DL values against the regulatory screening values.

Several other lines of evidence in soils and groundwater confirm concentrations of the four metals are consistent with background levels at Holloman AFB. The uncertainty associated with the elevated LODs is low and has no impact on the findings or recommendations of the RW-042 IM Report.

The NMED's guidance on two of their comments (arsenic and thallium) require clarification. The data do not support why the Permittee would need to re-sample monitoring wells for arsenic or thallium based on the information provided in the IM Report and summarized below, since groundwater samples collected from the Site monitoring wells have already demonstrated compliance with NMWQCC standards for arsenic and thallium, and that those standards do not apply, nor impact risk assessment at the Site based on natural TDS levels (12,000 to 13,000 milligrams per liter [mg/L]), which render the domestic water use risk pathway incomplete under all exposure scenarios.

Since the IM Report (URS, 2018) was already conditionally approved by NMED (October 31, 2018 and RTCs on October 2, 2019), and the conditions were met with submittal of the Disposal Notification Letter, we recommend no updates to the IM Report. Additional information, as described in this letter, can be included in an appendix of the forthcoming Corrective Action Complete Proposal for Site RW-042, if it needs to be maintained in the Administrative Record.

Specific items in the Request Letter are addressed below with additional details in **Attachment 2**.

NMED Comment #1: The reporting limit (RL) for antimony is above the background reference value, but well below the residential soil screening level. Even if antimony were retained for risk assessment at the

RL, no adverse risk would be noted. Antimony was also not detected at elevated levels in the downgradient wells, indicating there is likely no elevated antimony contamination. The Permittee must discuss the RL for antimony as an uncertainty in the risk assessment.

Response 1: The listed values for antimony soil sample results in Table 4-6 of the Interim Measures Report (i.e., less than [<] 6.1 milligrams per kilogram [mg/kg]) represent the LODs. The DLs are provided in the Laboratory Reports (IM Report, Appendix F), and ranged from 1.5 to 2.1 mg/kg for the antimony soil samples, so results as low as this range would have been reported (with F flags).

As noted in the comment, no adverse risk would be noted from these samples anyway, even if antimony were detected at the level of the elevated LODs. The uncertainty associated with the elevated LOD is low and has no impact on the findings or recommendations of the RW-042 IM Report.

NMED Comment #2: Four numerical results were collected for arsenic [in soil samples], with the results being below the residential screening level; the remaining results were non-detect with the RL above the residential screening level. Arsenic was detected in downgradient groundwater wells at levels equal to the groundwater standard. However, the levels for arsenic were greater in the upgradient well (MW01). It is likely that arsenic is present at levels representative of background, but lines of evidence are needed to address the elevated RLs. If sufficient lines of evidence cannot be provided to exclude arsenic as a Site contaminant, the Permittee must resample the monitoring wells for arsenic and utilize an analytical laboratory that can provide an RL for arsenic at or below the screening level.

Response 2: Arsenic results in total fraction groundwater samples were at or slightly above the New Mexico Water Quality Control Commission (NMWQCC) standard (0.01 mg/L). However, arsenic was also evaluated in the dissolved fraction samples and found at concentrations well below the NMWQCC standards. The NMWQCC standards for arsenic strictly apply to the dissolved fraction; therefore, those results for arsenic listed under Method SW6020A – Dissolved (in Table 4-9) are appropriate for comparison to the NMWQCC standard and for conducting risk calculations in accordance with NMED guidance. Additionally, in total fraction samples arsenic was elevated only in the up-gradient well; so not associated with the Site. Moreover, due to naturally high TDS levels groundwater standards are not applicable from a risk standpoint at the Site.

Arsenic was detected in subsurface soils at Site RW-042 in four samples, all from below a depth of 5 feet, with results ranging from 2.8 F mg/kg to 5 F mg/kg. It was not detected in 10 other samples at elevated LODs that ranged between < 9.7 mg/kg and < 14 mg/kg. In the case of the arsenic soil samples from 2016, the DLs ranged between 2.6 and 3.7 mg/kg (IM Report, Appendix F); therefore, had arsenic been detected in this range it would have been positively identified with an F flag. These DLs are below the residential soil screening level (R-SSL) for arsenic (7.07 mg/kg).

The arsenic concentrations in the four samples with positive detections in soil are consistent with the range of arsenic concentrations in subsurface soil samples from the background study (Final Basewide Background Study Report, Holloman Air Force Base, New Mexico, Rev. 3, July 2011 [NationView/Bhate, 2011]), where background samples had concentrations up to 5.8 mg/kg. The background value cited for arsenic (3.7 mg/kg) corresponds to the 'combined' surface and subsurface soil sample population in the background study. The subsurface soil sample population in the Background Study has a background value (95% upper tolerance limit [UTL]) of 4.75 mg/kg [NationView/Bhate, 2011]).

Additional lines of evidence regarding arsenic in soil and groundwater at the Site are provided in the Accelerated Corrective Measures Study Completion (ACM) Report (Bhate, 2012), and further discussed in **Attachment 2**.

NMED Comment #3: The RL for selenium is below the residential screening level. Even if selenium were retained for risk assessment at the RL, no adverse risk would be noted. Selenium was also not detected at

significant levels in either the upgradient or down gradient groundwater wells. These lines of evidence must be discussed as an uncertainty in the risk assessment.

Response 3: Selenium was not detected in the Site RW-042 soil samples, at LODs ranging from < 12 mg/L to < 17 mg/L. The R-SSL for selenium is 391.1 mg/kg. The samples were non-detect at over an order of magnitude less than the R-SSL concentration. As noted in the comment, no adverse risk would be noted from these samples even if selenium were detected at the level of the elevated LODs. The uncertainty associated with the elevated LOD is low and has no impact on the findings or recommendations of the RW-042 IM Report.

NMED Comment #4: The RL is above the residential screening level and in some cases, is above the industrial screening level. Thallium was not detected at significant levels in either the upgradient or downgradient groundwater wells. Similar to arsenic, lines of evidence are needed to justify the presence or absence of thallium to address the elevated RLs. If sufficient lines of evidence cannot be provided to exclude thallium as a Site contaminant, the Permittee must resample the monitoring wells for thallium and utilize an analytical laboratory that can provide an RL for arsenic at or below the screening level.

Response 4: Thallium was not detected in soil samples subject to the elevated LODs ranging from < 2.5 mg/kg to < 14 mg/kg. The samples were diluted by the lab due to interferences from other compounds. The associated DLs for the thallium soil samples ranged from 0.64 mg/kg to 3.6 mg/kg (IM Report, Appendix F), so any detections above 3.6 mg/kg (and above 0.64 mg/kg in selected samples) would have been reported (with F flags). The R-SSL for thallium is 0.78 mg/kg.

Thallium was also evaluated in 14 soil samples as reported in the ACM Report (Bhate, 2012), as provided in Appendix H-4 of the IM Report, in which it was not detected at LODs ranging from < 1.3 mg/kg to < 1.8 mg/kg. Thallium was not detected in any of the 126 combined samples (surface soil and subsurface soil) in the Basewide Background Study (NationView/Bhate, 2011), and was assigned a background concentration (95% UTL) of 1.3 mg/kg. Therefore, the approved 95% UTL for thallium in soils at Holloman AFB exceeds the NMED R-SSL value by nearly 70%, and the LODs in the 2012 ACM were at or closely above the 95% UTL concentrations.

In groundwater, samples collected during the IM resulted in one detection at 0.63 F micrograms per liter (µg/L) in MW-01, the up-gradient well for the total fraction (unfiltered) sample, with non-detected concentrations in the down-gradient wells at LODs of 0.2 µg/L. These values are an order of magnitude below the NMWQCC standard of 2 µg/L; however, the standards are not applicable due to elevated TDS concentrations on Site.

As noted in the NMED Risk Assessment Guidance for Investigation and Remediation (2019, Rev 2), the groundwater protection soil screening value (DAF-20) for thallium is 2.85 mg/kg. The very low concentrations of thallium in groundwater at Site RW-042 (an order of magnitude below the NMWQCC standard) are consistent with soil concentrations an order of magnitude below the DAF-20 concentration; or on the order of 0.28 mg/kg.

Based on the information presented in this letter, no additional updates to the IM Report are recommended at this time. Additional information, as described in this letter, can be included in an appendix of the forthcoming Corrective Action Complete Proposal for Site RW-042, if it needs to be maintained in the Administrative Record.

If you have any questions regarding this submittal, please contact me at (575) 572-6675.

Sincerely,

KUSMAK.ADAM.M.1263331806

Digitally signed by KUSMAK.ADAM.M.1263331806
Date: 2021.07.15 14:54:01 -06'00'

ADAM M. KUSMAK, GS-13, USAF

Attachment 1 – NMED Approval with Modification Letter (RW-042 IM Report) October 31, 2018 and NMED Approval with Modification Letter (RTCs to October 31, 2018 letter) October 2, 2019

Attachment 2 – Detailed RTC Table

cc:

(w/Atch)
Ms. Naomi Davidson
Hazardous Waste Bureau
121 Tijeras Dr. NE, Ste.1000
Albuquerque NM 87102-3400

(w/CD)
Ms. Laurie King
U.S. Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas TX 75202-2733

(w/o Atch)
Mr. Cornelius Amindyas
Hazardous Waste Bureau
121 Tijeras Dr. NE, Ste. 1000
Albuquerque NM 87102-3400

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6313
Phone (505) 476-6000 Fax (505) 476-6030
www.env.nm.gov

BUTCH TONGATE
Cabinet Secretary

BRUCE YURDIN
Acting Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

October 31, 2018

Mr. Adam Kusmak
Chief, Installation Management Flight
49th CES/CEI
550 Tabosa Avenue
Holloman AFB, NM 88330-8458

RE: APPROVAL WITH MODIFICATION
FINAL INTERIM MEASURES REPORT, SITE RW042 – RADIOACTIVE WASTE DISPOSAL AREA (SWMU 111), MAY 2018
HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422
HWB-HAFB-18-009

Dear Mr. Kusmak:

The New Mexico Environment Department (NMED) has reviewed the above referenced Interim Measures Report (Report) submitted on May 21, 2018 by Holloman Air Force Base (Permittee) The Report is hereby approved with the following modification.

The Report indicates that in November 2016 and April 2017 four buried concrete cylinders that were stacked on-top of each other were excavated from site RW042. Each cylinder is approximately 21 inches tall and 21 inches in diameter and weighs approximately 600 pounds. They were reported to contain "unknown quantities of suspected wastes, including research animal carcasses with low-level radioactivity and contaminated laboratory and pharmaceutical supplies". Pre-excavation surveys above ground and within the excavation found no evidence of radionuclides above ambient background. Soil and groundwater in the vicinity of the cylinders and the exteriors of the cylinders were sampled and did not exhibit radiological or non-radiological waste in excess of regulatory standards. After these characterization activities were completed, the four cylinders were reburied four feet below ground surface.

The Report recommends that site RW042 be granted corrective action complete (CAC) without controls status because the site has been adequately characterized to show that no radiological or non-radiological contaminants have been found that pose an unacceptable level of risk to human health or the environment. NMED disagrees with this recommendation. The Report indicates that the cylinders will be disposed of at a properly licensed facility. However, the Report further states that the "radiological information currently available for the four concrete cylinders is not sufficient for direct shipment to a licensed disposal facility and will require additional characterization…". The Report further indicates that the cylinders will be re-excavated and x-rayed "if a suitable contractor can be found" to determine whether a sealed source is present in the center of the cylinders. This uncertainty about whether the cylinders contain suspect waste and when, or if, they will be removed prevents the NMED from granting CAC status to the site until they are satisfactorily removed and transferred off site for disposal.

The Permittee must submit a Supplemental Interim Measures Work Plan for the proposed further characterization and removal and disposal of the cylinders by no later than **April 30, 2019**. This approval is based on the information presented in the document as it relates to the objectives of the work identified by NMED at the time of review. Approval of this document does not constitute agreement with all information or every statement presented in the document. If you have any questions regarding this letter, please contact Mr. David Strasser of my staff at (505) 222-9526.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
C. Schick, HAFB
S. Dorton, HAFB
C. Hendrickson, EPA Region 6 (6MM-RC)
L. King, EPA Region 6 (6MM-RC)

File: HAFB 2018 and Reading

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6313
Phone (505) 476-6000 Fax (505) 476-6030
www.env.nm.gov

Michelle Lujan Grisham
Governor

Howie C. Morales
Lt. Governor

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

October 2, 2019

Mr. Adam Kusmak
Chief, Installation Management Flight
49th CES/CEI
550 Tabosa Avenue
Holloman AFB, NM 88330

RE: APPROVAL WITH MODIFICATION
RESPONSE LETTER TO NMED APPROVAL WITH MODIFICATION LETTER, FINAL INTERIM MEASURES REPORT, SITE RW042 – RADIOACTIVE WASTE DISPOSAL AREA (SWMU 111), MAY 2018
HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422
HWB-HAFB-18-009

Dear Mr. Kusmak:

On September 17, 2019 the New Mexico Environment Department (NMED) received the Holloman Air Force Base (Permittee) September 12, 2019 response to NMED's October 31, 2018 Approval with Modification letter for the Interim Measures Report (Report). The response and, subsequently, the Report are hereby approved with the following modification.

The Permittee shall submit written notification to the NMED within 30 days of waste acceptance by Waste Control Specialists of Andrews, Texas. This notification shall be submitted no later than **February 3, 2020**.

This approval is based on the information presented in the document as it relates to the objectives of the work identified by NMED at the time of review. Approval of this document does not constitute agreement with all information, or every statement presented in the document.

If you have any questions regarding this letter, please contact Mr. David Strasser of my staff at (505) 222-9526.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
C. Schick, HAFB
C. Hendrickson, EPA, Region 6 (6LCRRC)
L. King, EPA, Region 6 (6LCRRC)

File: HAFB 2019 and Reading

ATTACHMENT 2
Detailed RTC Table

Common Comment and Response Worksheet (Version 3)

Date		Document Title (version)	Contract/TO Number	Air Force Concurrence
6-May-21			FA8903-13-C-0008	(Y/N) Provide comment if No
Item	Source	Request for Supplemental Information - Site RW-042 (Radioactive Waste Disposal Area, SWMU 111) Waste Disposal Notification Letter (May 6, 2021)	Contractor Response (5/17/21)	
Gen	NMED	General: NMED has reviewed the Final Interim Measures Report, Site RW042 - Radioactive Waste Disposal Area (SWMU 111) (Report) as part of a records review in preparation for a preliminary determination that corrective action is complete. A Class 3 modification request for Corrective Action Complete for SWMU 111 cannot be evaluated until the following comments concerning risk assessment are addressed:	General Response: The IM Report was previously approved with modification (October 2, 2019) with the condition that additional characterization (field x-rays) be conducted and that NMED be notified upon final disposal of the concrete cylinders. The cylinders have been further evaluated and disposed. NMED has requested additional lines of evidence regarding four metals that are not suspected contaminants linked in any way to past site operations. Elevated LODs (See Definitions below) in some soil samples exceeded NMED R-SSL values; however, in most cases the associated DLs were below the R-SSLs, so F flagged results would have been reported. Several other lines of evidence in soils and groundwater suggest concentrations of these metals are consistent with background levels at Holloman AFB. The uncertainty associated with the elevated LODs is low and has no impact on the findings or recommendations of the RW-042 IM Report. Clarification is requested regarding the guidance from NMED that the Permittee might have to resample groundwater for arsenic and/or thallium, as groundwater data already collected for those analytes demonstrates concentrations well below NMWQCC standards; and furthermore, there is no risk pathway from groundwater at the Site under any exposure scenarios due to extremely high natural TDS levels. Since the IM Report (URS, 2018) was already conditionally approved by NMED (October 2, 2019), and the conditions were met with submittal of the Disposal Notification Letter, we recommend no updates to the IM Report. Additional information, as described in this letter, can be included in an appendix of the forthcoming Corrective Action Complete Proposal for Site RW-042. Comment Acknowledged. Please see specific responses below.	
1	NMED	NMED Comment: The Reporting Limit (RL) for antimony is above the background reference value but well below the residential screening level. Even if antimony were retained for risk assessment at the RL, no adverse risk would be noted. Antimony was also not detected at elevated levels in the downgradient wells, indicating there is likely no elevated antimony contamination. The Permittee must discuss the RL for antimony as an uncertainty in the risk assessment.	Response: Operations at the Site included excavation with a large auger and burying of 4 concrete cylinders (or plugs) (21 inches in height x 21 inches in diameter), backfilling the excavation with removed native soils, and placing a concrete monument over the buried plugs. The concrete plugs were buried in the 1950s in this fashion based on Air Force practices (Technical Order TO 00-110A-1) and included concrete encasement (with the waste items cast-in-place) of used electronic components (dials, tubes, etc.) containing Cobalt-60. When excavated in 2019, the plugs were in good structural condition and maintained containment integrity based on visual inspection and results of concrete samples and surface swipe samples. Based on x-rays, the encased parts were deep within the cylinders with ample concrete cover on all sides. Inorganic metals in soil or groundwater are not suspected contaminants of concern (COCs) for Site RW-042. The listed values for antimony soil sample results in Table 4-6 of the Interim Measures Report (i.e., less than [<] 6.1 milligrams per kilogram [mg/kg]) represent the Limit of Detection (LOD) (See Definitions below). The samples were diluted by the lab due to interferences from other compounds. The LOD is the concentration above which the lab has a false positive rate of 1 percent (%) or lower. However, there is a Detection Limit (DL) that is well below the listed LOD, above which the lab will report a suspected detection. The DLs are provided in the Laboratory Reports (IM Report, Appendix F), and ranged from 1.5 to 2.1 mg/kg for the antimony soil samples. As noted in the comment, no adverse risk would be noted from these samples anyway, even if antimony were detected at the level of the elevated LODs. The uncertainty associated with the elevated LOD is low and has no impact on the findings or recommendations of the RW-042 IM Report.	
2	NMED	NMED Comment: Four numerical results were collected for arsenic (in soil samples), with the results being below the residential screening level; the remaining results were non-detect with the RL above the residential screening level. Arsenic was detected in downgradient groundwater wells at levels equal to the groundwater standard. However, the levels for arsenic were greater in the upgradient well (MW01). It is likely that arsenic is present at levels representative of background, but lines of evidence are needed to address the elevated RLs. If sufficient lines of evidence cannot be provided to exclude arsenic as a site contaminant, the Permittee must resample the monitoring wells for arsenic and utilize an analytical laboratory that can provide an RL for arsenic at or below the screening level.	Response: As described above, operations at the Site were limited to the burying of the concrete plugs, which maintained integrity with no signs or measurements that would indicate any leaching. Arsenic is not a suspected COC for Site RW-042. The groundwater results described above for arsenic were for 'total fraction' (i.e., unfiltered) groundwater samples. As described in the IM Report (Table 4-9), all three dissolved fraction samples (RW42-MW01, and -MW02 normal and field duplicate) resulted in arsenic concentrations ranging from 0.0024 F to 0.0026 F mg/L. The F flag indicates positive identification below the LOQ (Limit of Quantitation in Table 4-9) but above the DL. These dissolved fraction results are all below the applicable standards (0.01 milligrams per liter [mg/L]) by approximately an order of magnitude. The New Mexico Water Quality Control Commission (NMWQCC) standards for arsenic strictly apply to the dissolved fraction; therefore, those results for arsenic listed under Method SW6020A – Dissolved (in Table 4-9) are appropriate for comparison to the NMWQCC standard and for conducting risk calculations in accordance with NMED guidance. Arsenic was detected in subsurface soils at Site RW-042 in four samples, all from below a depth of 5 feet, with results ranging from 2.8 F mg/kg to 5 F mg/kg. It was not detected in 10 other samples at elevated LODs that ranged between < 9.7 mg/kg and < 14 mg/kg. As described above, the LODs represent values, above which the lab can confidently report a detection (with a 1% or less probability of a false positive). However, the lab would report detected values (with F flags) below the LODs down the DLs. In the case of the arsenic soil samples from 2016, the DLs ranged between 2.6 and 3.7 mg/kg (IM Report, Appendix F). These DLs are below the residential soil screening level (R-SSL) for arsenic (7.07 mg/kg). The arsenic concentrations in the four samples with positive detections in soil are consistent with the range of arsenic concentrations in subsurface soil samples from the background study (Final Basewide Background Study Report, Holloman Air Force Base, New Mexico, Rev. 3, July 2011 [NationView/Bhate, 2011]), where background samples had concentrations up to 5.8 mg/kg. Additionally, the background value cited for arsenic (3.7 mg/kg) corresponds to the 'combined' surface and subsurface soil sample population in the background study. The subsurface soil sample population in the Background Study has a background value (95% upper tolerance limit [UTL]) of 4.75 mg/kg [NationView/Bhate, 2011]). The subsurface soil sample results at Site RW-042 are consistent and within the range of background concentrations for subsurface soils at Holloman AFB (NationView/Bhate, 2011). Another line of evidence regarding the nature and extent of arsenic at Site RW-042 was provided in the Accelerated Corrective Measures Study Completion (ACM) Report (Bhate, 2012), and provided in Appendix H of the IM Report (Table H-4). Soil samples were collected from four locations surrounding the burial monument at the Site, at depths ranging from 10 to 24 feet below ground surface. Arsenic concentrations ranged from 1.1 B mg/kg to 3.4 mg/kg, where the B flag represents an estimated result below the RL. These soil sampling results are consistent with the population of background samples reported in the Background Study (NationView/Bhate, 2011). Groundwater samples were also reported in the ACM study and all arsenic concentrations were recorded as < 0.015 mg/L (IM Report Table H-4). All groundwater samples were 13,000 mg/L in total dissolved solids (TDS) indicating that groundwater is not a potable water resource and not subject to NMWQCC standards at Site RW-042. The NMED's guidance on Item #2 requires clarification. It's unclear why the Permittee would need to resample monitoring wells for arsenic given the information above, and the fact that groundwater samples collected from the Site monitoring wells have already demonstrated compliance with NMWQCC standards, and that those standards do not apply, nor impact risk assessment at the Site based on natural TDS levels, which render the potable water risk pathway incomplete under all exposure scenarios. The comments from NMED appear to conflate soil sample results with groundwater sample results.	

ATTACHMENT 2
Detailed RTC Table

Date		Document Title (version)	Contract/TO Number	Air Force Concurrence
6-May-21			FA8903-13-C-0008	(Y/N) Provide comment if No
Item	Source	Request for Supplemental Information - Site RW-042 (Radioactive Waste Disposal Area, SWMU 111) Waste Disposal Notification Letter (May 6, 2021)	Contractor Response (5/17/21)	
3	NMED	NMED Comment: The RL for selenium is below the residential screening level. Even if selenium were retained for risk assessment at the RL, no adverse risk would be noted. Selenium was also not detected at significant levels in either the upgradient or down gradient groundwater wells. These lines of evidence must be discussed as an uncertainty in the risk assessment.	Response: As described above, operations at the Site were limited to the burying of the concrete plugs, which maintained integrity with no signs or measurements that would indicate any leaching. Selenium is not a suspected COC for Site RW-042. Selenium was not detected in the Site RW-042 soil samples, at LODs ranging from < 12 mg/L to < 17 mg/L. The R-SSL for selenium is 391.1 mg/kg. The samples were non-detect at over an order of magnitude less than the R-SSL concentration. As noted in the comment, no adverse risk would be noted from these samples even if selenium were detected at the level of the elevated LODs. The uncertainty associated with the elevated LOD is low and has no impact on the findings or recommendations of the RW-042 IM Report.	
4	NMED	NMED Comment: The RL is above the residential screening level and in some cases, is above the industrial screening level. Thallium was not detected at significant levels in either the upgradient or downgradient groundwater wells. Similar to arsenic, lines of evidence are needed to justify the presence or absence of thallium to address the elevated RLs. If sufficient lines of evidence cannot be provided to exclude thallium as a site contaminant, the Permittee must resample the monitoring wells for thallium and utilize an analytical laboratory that can provide an RL for arsenic at or below the screening level.	Response: As described above, operations at the Site were limited to the burying of the concrete plugs, which maintained integrity with no signs or measurements that would indicate any leaching. Thallium is not a suspected COC for Site RW-042. Fourteen soil samples collected for the IM were analyzed for thallium. Thallium was not detected subject to the elevated LODs ranging from < 2.5 mg/kg to < 14 mg/kg. The samples were diluted by the lab due to interferences from other compounds. The associated DLs for the thallium soil samples ranged from 0.64 mg/kg to 3.6 mg/kg (IM Report, Appendix F), so any suspected detections above 3.6 mg/kg (and above 0.64 mg/kg in selected samples) would have been reported (with F flags). The R-SSL for thallium is 0.78 mg/kg. Thallium was also evaluated in 14 soil samples as reported in the ACM Report (Bhate, 2012), as provided in Appendix H-4 of the IM Report, in which it was not detected at LODs ranging from < 1.3 mg/kg to < 1.8 mg/kg. Thallium was not detected in any of the 126 combined samples (surface soil and subsurface soil) in the Basewide Background Study (NationView/Bhate, 2011), and was assigned a background concentration (95% UTL) of 1.3 mg/kg. Therefore, the 95% UTL for thallium in soils at Holloman AFB exceeds the NMED R-SSL value by nearly 70%, and the LODs in the 2012 ACM were at or closely above the 95% UTL concentrations. In groundwater, samples collected during the IM resulted in one detection at 0.63 F micrograms per liter (µg/L) in MW-01, the up-gradient well for the total fraction (unfiltered) sample, with non-detected concentrations in the down-gradient wells at LODs of 0.2 µg/L. These values are an order of magnitude below the NMWQCC standard of 2 µg/L; however, the standards are not applicable due to elevated TDS concentrations on site. As noted in the NMED Risk Assessment Guidance for Investigation and Remediation (2019, Rev 2), the groundwater protection soil screening value (DAF-20) for thallium is 2.85 mg/kg. The very low concentrations of thallium in groundwater at Site RW-042 (an order of magnitude below the NMWQCC standard) are consistent with soil concentrations an order of magnitude below the DAF-20 concentration; or on the order of 0.28 mg/kg. The NMED's guidance on Item #4 requires clarification. It is not clear why the Permittee would need to resample monitoring wells for thallium given the information above and the fact that groundwater samples collected from the Site monitoring wells have already demonstrated compliance with NMWQCC standards, and that those standards do not apply nor impact risk assessment at the Site based on natural TDS levels, which render the potable water risk pathway incomplete under all exposure scenarios.	
			Definitions: The following definitions are used in the responses above: 1) The Detection Limit (DL), is the smallest analyte concentration that can be demonstrated to be different from 0 with 99% confidence, with a 1% rate of false positives; 2) the Limit of Detection (LOD), is greater than the DL, and is the smallest concentration of a substance that must be present in a sample in order to be detected at the DL with 99% confidence, with a 1% rate of false negatives; and 3) the Level of Quantitation (LOQ), is the smallest concentration that produces a quantitative result with known and recorded precision and bias. Therefore, the following is true: DL < LOD < LOQ.	