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DEPARTMENT OF THE AIR FORCE
377TH AIR BASE WING (AFGSC)

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MAR 2 6 2020

Colonel David S. Miller
Commander
377th Air Base Wing
2000 Wyoming Blvd SE
Kirtland AFB NM 87117

Mr. Kevin Pierard, Chief
Hazardous Waste Bureau (HWB)
New Mexico Environment Department (NMED)
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6313

Dear Mr. Pierard

Kirtland Air Force Base (AFB) is respectfully requesting an extension for submittal of a revised Ethylene Dibromide In Situ Biodegradation Report. The March 4, 2020, "Disapproval Ethylene Dibromide In Situ Biodegradation Report Bulk Fuels Facility Solid Waste Management Units ST-106 and ST-111 Kirtland Air Force Base, New Mexico EPA ID# NM6213820974 HWB-KAFB-19-011" set a submittal date of June 5, 2020. The Air Force respectfully requests an extension until December 31, 2021, for the reasons detailed below:

1. **Background**

a. It is important to understand what a pilot test is and equally important to understand what it is not. A pilot test is a focused, limited-scale test of a technology that is used to determine potential effectiveness under field conditions and the feasibility of including the technology in the final remedy. A pilot test is not an interim measure and is not intended to fill data gaps in the investigation of nature and extent of contamination.

b. The ethylene dibromide (EDB) in situ biodegradation pilot was designed to evaluate the extent to which potential treatment amendments for in situ biostimulation and bioaugmentation enhance anaerobic EDB biodegradation processes. The use of bioremediation, with and without bioaugmentation, is a common remedial approach to treat chlorinated solvents such as trichloroethene and is a promising but presently innovative and unvalidated technology for promoting the degradation of EDB to nontoxic products. Based upon positive results in a bench scale study, the Air Force funded this pilot test to evaluate the potential feasibility of this technology to support the final remedy. The work plan was submitted to NMED on October 26, 2016 (https://hwbdocuments.env.nm.gov/Kirtland%20AFB/KAFB4462.pdf).

c. The scope of work implemented by the Air Force complied with the work plan approved by NMED on December 12, 2016 (https://www.env.nm.gov/wp-content/uploads/2016/06/Colonel-Eric-H.-Froehlich-John-Pike-Letter-12-12-16-SIGNED.pdf) and the 07 August 2018, deferral of bioaugmentation (https://hwbdocuments.env.nm.gov/Kirtland%20AFB/KAFB4694.pdf).

d. In addition, efforts described in the work plan related to changes in the carbon isotope composition of EDB during degradation were funded separately by the U.S. Department of Defense (DoD) Environmental Security Technology Certification Program (ESTCP) research

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project ER-201331 (https://serdp-estcp.org/Program-Areas/Environmental-Restoration/Contaminated-Groundwater/Emerging-Issues/ER-201331/ER-201331/(language)/eng-US). The ESTCP research program was established in 1995 to promote the transfer of innovative technologies, including remediation technologies, from proof-of-concept to practical application, and the ongoing ESTCP project is entitled, "Natural Attenuation and Biostimulation for In Situ Treatment of 1,2-Dibromoethane (EDB)." While ESTCP project ER-201331 includes efforts examining natural attenuation of EDB, the primary objective of the ESTCP scope to demonstrate in situ bioremediation of EDB under anaerobic conditions and to test the innovative technology of compound specific isotope analysis (CSIA) to observe changes in the carbon isotope composition of EDB during this biodegradation process.

e. The scope of the EDB in situ biodegradation pilot was not intended to address the delineation and/or mitigation of light non-aqueous phase liquid (LNAPL) or evaluate possible data gaps in the monitoring well network in the source area. The Air Force agrees that an understanding of the distribution of residual LNAPL in the vadose and saturated zones is critical to defining the nature and extent of contamination from the fuel leak, evaluating the mobility of this residual LNAPL, and preparing for the Corrective measures Evaluation (CME). That is why the Air Force checks for the presence of LNAPL each quarter. For example, in the fourth quarter of 2019, 165 of 167 groundwater monitoring wells were checked for the presence of LNAPL. The Air Force reports these data to NMED each quarter.

f. A vadose zone coring investigation was performed separate from this pilot test to provide supplemental data on the nature and extent of the residual LNAPL and to characterize the subsurface biogeochemical conditions relative to residual hydrocarbon and EDB. As detailed in the November 2019 *Source Zone Characterization Report*, continuous cores were drilled to the water table at 11 locations to define the horizontal and vertical extent of LNAPL in the source area. In addition to the LNAPL characterization, nested monitoring wells were constructed in each borehole with nine dual-completion groundwater monitoring wells and two six-nest soil vapor monitoring wells. The groundwater monitoring wells were installed to address data gaps in the source zone created by the rising groundwater elevation. The soil vapor monitoring wells were installed as observation wells for the bioventing pilot study that began in 2018.

2. <u>Extension Request</u>

a. The February 25, 2019 letter from NMED established a May 1, 2019 submittal date for a report summarizing the results of the in situ biodegradation pilot test. This deadline was premature because the Phase 4 sampling had not been implemented. The work plan for the Phase 4 sampling was submitted to NMED on February 18, 2020. The primary objective of this final phase of the EDB in situ biodegradation pilot is to help evaluate the continued degradation of EDB, or its possible rebound through the quarterly groundwater monitoring of contaminant, geochemical, and microbial parameters. The original work plan proposed a minimum two quarterly sampling events for Phase 4. The Air Force proposes extending the submittal date for the revised report to December 31, 2021, to allow for NMED's approval of the work plan and four quarters of sampling after the work plan is approved.

b. This proposed date is based upon the following:

(1) Work plan was submitted to NMED on February 18, 2020;

(2) NMED approved the work plan by May 18, 2020 (20.4.2.208 NMAC allows for an NMED review time of 90 days for a pilot/aquifer test work plan);

(3) The first sampling event would be during the third quarter of 2020 (samplers for the second quarter have already been deployed);

(4) The last sampling event to support the revised report would be collected in the third quarter of 2021; and

(5) Revised *Ethylene Dibromide In Situ Biodegradation Report* would be submitted on December 31, 2021 (the same time as the third quarter 2021 report is due).

If NMED approves the work plan before or after the estimated date the Air Force will submit a revised extension request. The Air Force believes that submitting a revised *Ethylene Dibromide In Situ Biodegradation Report* before Phase 4 data are collected would be inconsistent with our mutual goal of focusing on environmental results and gaining a better understanding of biodegradation processes to ensure that each corrective action related activity supports the CME.

In the interim, the Air Force requests a meeting with the NMED Hazardous Waste Bureau to discuss our technical and regulatory concerns with the March 4, 2020, Notice of Disapproval letter. In addition to any elements of the report itself, we believe it is important to discuss completed and ongoing LNAPL-related efforts such as the source area characterization investigation and the quarterly LNAPL sampling.

As always, if you have any questions or concerns, please contact Mr. Chris Segura at commercial (505) 853-5443 or by email at christopher.segura.2@us.af.mil; or Mr. Sheen Kottkamp at (505) 846-7674 or by email at sheen.kottkamp.1@us.af.mil.

Sincerely

CHRISTOPHER J. KING, Colonel, USAF
Vice Commander

cc:
Office of U.S. Senator Martin Heinrich (Eubanks), electronic only
Office of U.S. Senator Tom Udall (Woldman), electronic only
Office of U.S. House of Representatives Congresswoman Deb Haaland (Sanchez), electronic only
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NMED-OOTS (Pruett), letter
NMED-HWB (Cobrain), letter and CD
NMED-GWQB (Hunter), letter
NMED Resource Protection Division (Stringer), letter
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