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ENTERED

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

April 6, 2018

Colonel Richard W. Gibbs  
Base Commander  
377 ABW/CC  
2000 Wyoming Blvd SE  
Kirtland AFB, NM 87117-5606

Mr. Chris Segura  
Chief, Installation Support Section  
AFCEC/CZOW  
2050 Wyoming Blvd SE, Suite 124  
Kirtland AFB, NM 87117-5270

**RE: WORK PLAN FOR BIOVENTING AND AIR-LIFT ENHANCED BIOREMEDIATION PILOT TESTS  
BULK FUELS FACILITY  
SOLID WASTE MANAGEMENT UNIT ST-106/SS-111  
KIRTLAND AIR FORCE BASE  
EPA ID# NM9570024423, HWB-KAFB-13-MISC**

Dear Colonel Gibbs and Mr. Segura:

The New Mexico Environment Department (“NMED”) is in receipt of the Kirtland Air Force Base (“KAFB”) (“Permittee”) *Work Plan for Bioventing and Air-Lift Enhanced Bioremediation Pilot Tests* (“Work Plan”), dated November 2017. The objective of the Work Plan is to detail the activities to be implemented in performing treatability studies to support the future Corrective Measures Evaluation (“CME”) for the Bulk Fuels Facility (“BFF”) source area and groundwater solute plume.

As explained in the Work Plan, bioventing includes the delivery of oxygen to the contaminated vadose zone (unsaturated soils) via air injection to stimulate biodegradation. The bioventing pilot testing will include short-duration “dry” and “moist” respiration tests (approximately three weeks), followed by two longer-term (two years in duration) pilot tests conducted simultaneously. The goal of the bioventing pilot test is to measure the oxygen utilization rate by microbes in the subsurface. The rate of oxygen utilization is directly proportional to the aerobic biodegradation rate of fuel hydrocarbons in the subsurface, and is therefore an indication of the effectiveness of bioventing to achieve site cleanup in a timely manner. Contaminant mass

KAFB4665



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destruction rate, cleanup time, and cost of corrective measure implementation can be estimated to support the future CME.

Air-lift enhanced bioremediation includes stimulating microbes within the aquifer matrix by creating a circulation cell through the injection of air below the water table. The injected air forces entrained water out of the lower portion of the well screen and "lifts" it above the static water level where it flows outward into the capillary fringe and upper portion of the water table. While lifting, contaminants are stripped and the groundwater is oxygenated. This "aerated" water flows out into the upper portion of the water table, a zone of the solute plume typically with high solute and residual contamination, where it adds oxygen to enhance aerobic biodegradation. The air-lift enhanced bioremediation pilot test is scheduled to operate for a period of two years.

The Work Plan is hereby approved subject to the following conditions:

1. The Permittee shall replace (as a single page replacement) the original Figure 3-1 with a revised version showing the locations of groundwater monitoring wells in the vicinity of the pilot test areas.
2. It is acknowledged that the screened intervals for nested soil vapor wells KAFB-106V1 and KAFB-106V2 were selected based on the lithology and screened intervals of nearby soil vapor wells. If, during the installation of KAFB-106V1 and KAFB-106V2, substantially different lithology is encountered, the Permittee and NMED shall meet to discuss the need for possible adjustments to screened intervals.
3. During the course of the pilot tests, the Permittee shall identify the source(s) of water that will be used for soil moisture addition. If any water source to be used is disinfected with chlorine, the Permittee shall describe what measures will be taken to ensure that chlorine residual concentrations will not adversely affect the ability of soil bacteria to biodegrade fuel contaminants.

If you have any questions regarding this letter, please contact NMED Chief Scientist Dennis McQuillan at (505) 827-2140.

Sincerely,



Juan Carlos Borrego  
Deputy Secretary  
Environment Department

cc: Col. M. Harner, KAFB  
K. Lynnes, KAFB  
B. Renaghan, AFCEC  
S. Clark, KAFB-AFCEC

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File: KAFB 2018 Bulk Fuels Facility Spill