



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 377TH AIR BASE WING (AFMC)

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2000 Wyoming Blvd SE  
Kirtland AFB NM 87117-5600

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Mr. John Kieling, Chief  
Hazardous Waste Bureau (HWB)  
New Mexico Environment Department (NMED)  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, New Mexico 87505-6303

NMED  
Hazardous Waste Bureau

Dear Mr. Kieling:

This letter is in reference to the Final *Groundwater Extraction Well KAFB-106157 Aquifer Testing Work Plan, Bulk Fuels Facility (BFF) Spill, Solid Waste Management Units ST-106 and SS-111, Kirtland Air Force Base* dated October 30, 2013. Based on the results from the influent and effluent samples collected during the step test conducted on October 30, 2013, we determined that revisions are required to the treatment system design in order to treat manganese concentrations to below the treatment standard (New Mexico Groundwater Protection Standard). This letter is intended to document the variance from the original work plan with the additions to the treatment design.

A step test was conducted on October 30, 2013 in accordance with the methodology outlined in the above referenced work plan. As part of the work plan, samples were collected from the well head at KAFB-106157 as well as from the primary, secondary, and tertiary carbon beds. Water was containerized in three frak tanks located in the secure, fenced treatment area pending analytical results. The sample results from the sample collected after the tertiary carbon bed had a detected manganese concentration of 0.324 milligrams per liter (mg/L); the New Mexico Groundwater Protection Standard for manganese is 0.20 mg/L. The inlet concentration of manganese, collected from the well head at KAFB-106157, was 0.403 mg/L, indicating the need for a change to the original treatment design.

The following change was made to the treatment system design in order to address the manganese concentrations above the required treatment standard for discharge:

- After the carbon beds and outlet filter bags, bleach will be injected into the wastewater stream at a concentration between 40 and 80 parts per million.
- Using the outlet frak tanks, the water and bleach mixture will have a residence time of 2 hours prior to discharge. The residence time allows for adequate removal of manganese from the water and is based on a series of bench scale tests completed by Shaw Environmental, Inc. (a CB&I company) using water from KAFB-106157.
- During the course of the constant rate test, pH will be monitored every 3 to 4 hours from the four sample ports. If there is a change to the pH, soda ash may be added to the inlet frak tank to keep the pH range optimal for manganese removal once the bleach has been added. Bench scale testing indicates that optimal removal occurs at a pH of 8 to 9. Additionally, the pH in the effluent and discharge point will be monitored to ensure that water for discharge meets the New Mexico

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Groundwater Protection Standard of 6-9. Muriatic acid (HCl) at 25 percent concentration may be added to the outlet frak tanks to control the pH of water for discharge.

- After reaching sufficient residence time and after verification of pH, the treated water will flow through a discharge pump (120 gallons per minute) to the retention pond and/or Zia Park, as indicated in Section 3.0 of *Groundwater Extraction Well KAFB-106157 Aquifer Testing Work Plan, Bulk Fuels Facility (BFF) Spill, Solid Waste Management Units ST-106 and SS-111, Kirtland Air Force Base.*

We have completed field verification of the changes to the treatment design using extracted water from KAFB-106157. Analytical data collected during the field verification of the treatment design demonstrate that following treatment manganese was sufficiently removed to a nondetectable concentration.

Please contact Mr. L. Wayne Bitner at 505.853.3484 or at [ludie.bitner@kirtland.af.mil](mailto:ludie.bitner@kirtland.af.mil) or Mr. Scott Clark at 505.846.9017 or at [scott.clark@kirtland.af.mil](mailto:scott.clark@kirtland.af.mil) if you have any questions.

Sincerely



TOM D. MILLER, Colonel USAF  
Commander

cc:

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NMED-HWB (Cobrain, Moats, McDonald, Brandwein) w/atth  
NMED-GWQB (J. Schoepner) w/atth  
NMED-PSTB (Reuter) w/atth  
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