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



Colonel Eric H. Froehlich
377 ABW/CC
2000 Wyoming Blvd SE
Kirtland AFB NM 87117-5600

Mr. John Kieling, Manager
RCRA Permits Management Program
Hazardous Waste Bureau (HWB)
New Mexico Environment Department (NMED)
2905 Rodeo Park Road
Santa Fe New Mexico 87505

Dear Mr. Kieling,

We are pleased to submit the attached *Rapid Response Action to Notice of Violation Groundwater Disposition Work Plan, Bulk Fuels Facility, Kirtland Air Force Base, New Mexico.* This work plan summarizes the options for disposition of treated water from the Bulk Fuels Facility Spill Site (Solid Waste Management Units ST-106/SS-111), which were determined at the complex site investigation meeting held on August 25, 2015. In addition, this work plan discusses the work that will be performed to determine which options are the most viable.

Please contact Mr. Wayne Bitner at 505.853.3484 or at ludie.bitner@us.af.mil, or Mrs. Victoria Branson at 505.846.6362 or at victoria.branson@us.af.mil if you have any questions or concerns.

Sincerely,

ERIC H. FROEHLICH, Colonel, USAF
Commander

cc:
NMED-EHD (Roberts, McQuillan, Agnew)
NMED (Longmire)
NMED-HWB (Cobrain, McDonald)
NMED-GWQB (Hunter, Huddleson, Cook)
NMED-PSTB (Reuter)
AFCEC-CZRX (Bodour)
USACE-ABQ District Office (Simpler, McBee, Phaneuf)
USACE-Omaha (Ellender)
Public Info Repository (Central New Mexico Community College), Administrative Record/Information Repository (AR/IR), and F

# 40 CFR 270.11
# DOCUMENT CERTIFICATION
# SEPTEMBER 2015

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

ERIC H. FROEHLICH, Colonel, USAF
Commander, 377th Air Base Wing

This document has been approved for public release.

KIRTLAND AIR FORCE BASE
377th Air Base Wing Public Affairs

Prepared by CB&I Federal Services LLC
2440 Louisiana Blvd. NE, Suite 300
Albuquerque, NM 87110
Tel: +1 505 262 8800
Fax: +1 505 262 8855
www.CBI.com

**Subject: Rapid Response Action to Notice of Violation Groundwater Disposition Work Plan, Bulk Fuels Facility, Kirtland Air Force Base, New Mexico**

This Kirtland Air Force Base (AFB) Bulk Fuels Facility (BFF) Rapid Response Action Groundwater Disposition Work Plan has been prepared by CB&I Federal Services LLC (CB&I) for the U.S. Army Corps of Engineers (USACE), Omaha District, under Contract No. W9128F-12-D-0003, Task Order 0025.

This letter Work Plan (hereafter referred to as Work Plan) outlines the activities needed to determine the optimal methods for disposition of treated water extracted from the BFF Spill site ethylene dibromide plume. These activities were agreed upon at a complex site investigation (CSI) meeting by USACE, the Air Force Civil Engineering Center, Kirtland AFB, the New Mexico Environment Department (NMED), the Albuquerque Bernalillo County Water Utility Authority, and CB&I on August 25, 2015. Water from the BFF Spill site (Solid Waste Management Units ST-106/SS-111) is currently extracted from the aquifer, treated through a granular-activated carbon system, and discharged to the Kirtland AFB Golf Course Main Pond (USACE, 2014). However, in winter months, the golf course cannot accept the full discharge amount (a proposed maximum of 400 gallons per minute [gpm] by 2016 and up to 800 gpm in subsequent years), and alternatives for disposition of the treated water are necessary. The CSI team identified a hierarchy of methods to dispose of treated water from Solid Waste Management Units ST-106/SS-111, which is prioritized as follows:

1. **Discharge of treated water to Kirtland AFB Golf Course Main Pond**—Discharge to this location is currently ongoing under the temporary permission to discharge letter, which was received from the NMED Groundwater Quality Bureau on June 1, 2015.
2. **Injection of treated water into existing extraction well Kirtland AFB (KAFB)-7 on Kirtland AFB**—This is a short-term discharge option to dispose of water extracted during winter of 2015/2016.
3. **Discharge to infiltration galleries in Tijeras Arroyo on Kirtland AFB**—This is a long-term option to dispose of water generated during winters beginning in 2016/2017.
4. **Direct discharge to Tijeras Arroyo on Kirtland AFB**—This is a long-term option to dispose of water generated during winters beginning in 2016/2017.

## Field Activities

The activities outlined in this Work Plan will inform the validity of these water-disposal options. Tasks to be performed under this Work Plan include the following:

1. Performance of percolation testing at two locations in Tijeras Arroyo on Kirtland AFB (Figure 1). Percolation testing will determine whether the alluvial sediments of the Tijeras Arroyo provide adequate drainage to install infiltration galleries in one or both of these areas. Three soil borings and percolation tests will be performed in each area (Figure 2). Percolation testing will be performed in accordance with the January 26, 2015 Percolation Testing Work Plan (USACE, 2015) with the following exceptions:
    a. Soil borings will be advanced to 50 feet below ground surface (bgs) instead of 40 feet bgs to provide adequate information on infiltration rates in the subsurface.

b. Next to each soil boring location, percolation testing will be performed at two depths, the first at the surface to 5 feet bgs to determine the surface infiltration rate during precipitation events in Tijeras Arroyo. The second will be at 5-foot screen interval at a depth between 5 and 20 feet bgs, which will be determined based on the lithology documented in the soil boring. The initial water level in the second percolation test will be approximately 5 feet above the top of the screen. In the first test, the initial water level will be ground surface.

c. Percolation testing will be performed using slotted casing to measure the horizontal conductivity in addition to the vertical conductivity. This will provide a more accurate understanding of what the infiltration rates will be in each area.

d. Unexploded ordinance (UXO) surface clearance will not be performed prior to breaking ground. UXO clearance was specific to the area near Hardin Drive SE described in the Percolation Testing Work Plan (USACE, 2015). After discussions with Kirtland AFB personnel and review of the history of the area, it was determined that a UXO surface clearance is not needed in the current percolation testing areas in Tijeras Arroyo.

2. Performance of initial shutdown monitoring and evaluation of well KAFB-7 (Figure 1). The condition and performance of KAFB-7 will be evaluated to confirm that it is viable to act as an injection well. Initial observation of drawdown and field conditions will be made at the well before pumping is discontinued. Subsequently, a rebound test will be performed to evaluate the rebound curve when pumping is ceased. The initial testing will be performed as follows:

    a. Transducers will be placed in KAFB-7 and the four closest wells (Figure 1). The well pump will be turned off for at least 24 hours, after which, the pump will be turned on and drawdown will be monitored while pumping at KAFB-7 is ongoing at a constant rate of approximately 750 to 800 gpm. Transducers will monitor water levels in KAFB-7 and the surrounding wells for approximately 24 hours. Water generated during the 24 hour pumping period will continue to be discharged to the Kirtland AFB Golf Course Pond

    b. At the end of the 24 hour pumping period, a sample will be collected for total and dissolved metals by EPA Method 6020, total and dissolved silicon by EPA Method 6010, anions by EPA Method 300, total and dissolved alkalinity by SM2320B, total dissolved solids by SM2540C, total and dissolved organic carbon by SM5310B, and total Kjeldahl Nitrogen by SM4500. This list of analytes was developed at the August 25, 2015 CSI meeting.

    c. Following the 24-hour period, pumping at KAFB-7 will cease, and the rebound at the well and the surrounding monitoring wells will be monitored for a maximum of 3 days or until the water level in each well has reached equilibrium (data-driven).

    d. Preliminary data from the rebound testing will be distributed via email to the CSI team following the completion of the test.

Once rebound testing is complete, all downhole equipment, including the transducer and pump, will be removed from KAFB-7. A downhole camera will be used to collect video footage of KAFB-7 in addition to logging with a three-arm caliper probe, if necessary, to evaluate the condition of the well.

The results of the initial drawdown and rebound monitoring of KAFB-7 will provide information on the aquifer properties at the well location, which will help to determine the injection rates. The video and caliper log will allow for a determination of the structural integrity of the well. These data will provide confirmation that injection into KAFB-7 is a viable method for returning treated water to the aquifer.

## Permitting

Each method of disposition of treated water listed above will require the necessary state and federal permits as discussed below:

**New Mexico Office of the State Engineer**—A permit will be submitted to the Office of the State Engineer to change the purpose of use of KAFB-7 to allow for injection. All required permitting will be performed prior to injection at KAFB-7. No permits from this agency are required to discharge water to infiltration galleries or to the Tijeras Arroyo.

**NMED Groundwater Quality Bureau**—The current discharge permit DP-1770 allows for discharge to infiltration galleries on Kirtland AFB. This permit is being amended to include discharge to injection wells on Kirtland AFB property.

**U.S. Environmental Protection Agency**—Coordination with this agency will be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit to discharge to Tijeras Arroyo. Infiltration galleries beneath Tijeras Arroyo may require an emergency NPDES permit in case of an accidental discharge to the Arroyo from the infiltration galleries. No permit is required to discharge to KAFB-7.

**Kirtland AFB**—Coordination with the Federal Aviation Administration, Kirtland AFB Security, and the Kirtland AFB Dig Permit office will be necessary for each disposal option.

## References

USACE. 2014. *Groundwater Extraction Pilot Implementation and Additional Plume Characterization Work Plan , Bulk Fuels Facility (BFF) Spill, Solid Waste Management Units ST-106 and SS-111, Kirtland Air Force Base, Albuquerque, New Mexico.* Prepared by CB&I Federal Services, Inc. for the USACE Albuquerque District under USACE Contract No. W912DY-10-D-0014, Delivery Order 0002. August.

USACE. 2015. *Kirtland Air Force Base Bulk Fuel Facility Spill – Phase 2 Percolation Test Work Plan, Bulk Fuels Facility (BFF) Spill, Solid Waste Management Units ST-106 and SS-111, Kirtland Air Force Base, Albuquerque, New Mexico.* Prepared by CB&I Federal Services, Inc. for the USACE Albuquerque District under USACE Contract No. W912DY-10-D-0014, Delivery Order 0002. January.

# FIGURES

1,542,000 1,544,000 1,546,000 1,548,000 1,550,000 1,552,000 1,554,000 1,556,000 1,558,000 1,560,000 1,562,000

1,478,000 1,476,000 1,474,000 1,472,000 1,470,000 1,468,000 1,466,000 1,464,000 1,462,000

GIBSON
KAFB-106228
LOUISIANA
GIBSON
WYOMING
PENNSYLVANIA
RANDOLPH
TEXAS
HARDIN
KAFB-7
KAFB-0523
SOUTHGATE
KAFB-0521
KAFB-0507
See Detail Map
KAFB-2626
WYOMING
PENNSYLVANIA
Arroyo Tijeras
Tijeras Canyon
Arroyo del Coyote
KAFB-1589
KAFB-0609
KAFB-0610
KAFB-0602
Figure 2 Area

Detail Map
KAFB-7
SOUTHGATE
819 ft
282 ft
1,406 ft
1,853 ft
KAFB-0523
KAFB-0521
KAFB-0507
KAFB-2626
0 125 250 500
Feet

## Legend

- Monitoring Well
- Existing Extraction Well
- Proposed Extraction Well
- Distance Line from KAFB-7
- Influent Pipeline
- Permanent Effluent Pipeline
- Pipe from KAFB-7
- Ephemeral Stream
- Permanent Groundwater Treatment System
- Percolation Testing Locations
- Tijeras Arroyo Golf Course
- Pond






N

Revision Date: 09/02/15

0 1,000 2,000 4,000
Feet
1 inch = 2,000 feet

Projection : NAD83 State Plane New Mexico Central FIPS3002 Feet

RAPID RESPONSE GROUNDWATER
DISPOSAL WORK PLAN
BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE 1

KAFB-7 AND PERCOLATION
TESTING LOCATIONS

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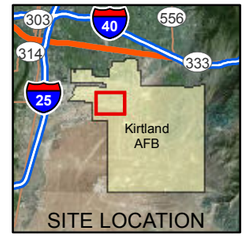
## Legend

- Proposed Percolation Test Borehole Location
- Ephemeral Stream
- Percolation Testing Locations

Testing locations shown are estimated and may be adjusted in the field based on observed site conditions and geology. Each location represents a soil boring to 50 feet bgs with percolation tests at the surface and a second depth to be determined based on lithology.

bgs = below ground surface






Revision Date: 09/02/15

N

0 400 800 1,600

Feet

1 inch = 800 feet

Projection : NAD83 State Plane New Mexico Central FIPS3002 Feet

RAPID RESPONSE GROUNDWATER
DISPOSAL WORK PLAN
BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE 2

PERCOLATION TESTING LOCATIONS

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