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Governor

**Howie C. Morales**  
Lt. Governor

**NEW MEXICO  
ENVIRONMENT DEPARTMENT**

**Hazardous Waste Bureau**

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**James C. Kenney**  
Cabinet Secretary

**Jennifer J. Pruett**  
Deputy Secretary

**CERTIFIED MAIL - RETURN RECEIPT REQUESTED**

December 17, 2020

Colonel David S. Miller  
Base Commander  
377 ABW/CC  
2000 Wyoming Blvd SE  
Kirtland AFB, NM 87117

Lt. Colonel Wayne J. Acosta  
Civil Engineer Office  
377 Civil Engineer Division  
2050 Wyoming Blvd SE, Suite 116  
Kirtland AFB, NM 87117

**RE: DISAPPROVAL  
OPERATIONS AND MAINTENANCE PLAN GROUNDWATER TREATMENT SYSTEM  
BULK FUELS FACILITY SOLID WASTE MANAGEMENT UNITS ST-106 AND SS-111  
REVISION R3  
KIRTLAND AIR FORCE BASE, NEW MEXICO  
EPA ID# NM6213820974  
HWB-KAFB-20-003**

Dear Colonel Miller and Lt. Colonel Acosta:

The New Mexico Environment Department (NMED) is in receipt of the Kirtland Air Force Base (Permittee) *Operations and Maintenance Plan Groundwater Treatment System, Bulk Fuels Facility, Solid Waste Management Units ST-106/SS-111, Revision R3 (O&M Plan)*, dated April 2020. NMED has reviewed the O&M Plan and hereby issues this Disapproval. NMED’s comments are provided in the attachment to this letter.

The Permittee must submit a revised O&M Plan that addresses all comments contained in the attachment. Two hard copies and an electronic version of the revised O&M Plan must be submitted to the NMED. The Permittee must also include a redline-strikeout version of the O&M Plan in electronic format showing where all revisions to the O&M Plan have been made. The revised O&M Plan must be accompanied with a response letter that details where all

revisions have been made, cross-referencing NMED's numbered comments. The Revised O&M Plan must be submitted to NMED no later than **March 31, 2021**.

Should you have any questions, please contact Michiya Suzuki of my staff at (505) 476-6046.

Sincerely,

**Kevin  
Pierard**  Digitally signed by  
Kevin Pierard  
Date: 2020.12.17  
14:39:09 -07'00'

Kevin M. Pierard, Chief  
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB  
B. Wear, NMED HWB  
M. Suzuki, NMED HWB  
L. King EPA Region 6 (GLCRRC)  
S. Kottkamp, KAFB  
K. Lynnes, KAFB  
C. Cash, KAFB

File: KAFB 2020 Bulk Fuels Facility Spill and Reading

Attachment



## **GENERAL COMMENTS**

### **1. Lack of Page Numbers in Tables, Figures, and Appendices**

**NMED Comment:** Page numbers are missing from some sections of the O&M Plan (e.g., Revision Tracking Table, Appendix D, *Process Drawings and Groundwater Treatment System Equipment/Instrument Location Pictures*). Please provide appropriate page numbers in all parts of the O&M Plan, including tables, figures, and appendices. Please revise the O&M Plan accordingly.

### **2. Inclusion of New Information**

**NMED Comment:** An installation of UIC Injection Well KAFB-106IN2 was approved on March 3, 2020. If installed, the Permittee must add the installation information for the well to the next annual revision of the O&M Plan. New relevant information and changes to the system must be included in the latest version of the O&M Plan. No response required.

### **3. Acronyms and Abbreviations**

**NMED Comment:** The Acronyms and Abbreviations section must include the meaning of all acronyms and abbreviations where those were not included in the text. For example, the meaning of "TIGG" is not provided in the Acronyms and Abbreviations section, nor is it included in the text of the O&M Plan. Similarly, the acronyms KD, KI, and KP appear in several places in Table 2-3, *Standard Operational Set Points*, page 1 of 1, and Appendix D, *Process Drawings and Groundwater Treatment System Equipment/Instrument Location Pictures* without the meaning of these acronyms provided. Please make the necessary revisions to the O&M Plan.

## **SPECIFIC COMMENTS**

### **4. Section 1.2, Overall System Description, page 1-2, and Section 2.3, Influent Tank, Pumps, and Pretreatment Sand Filters, pages 2-2 and 2-3**

**Permittee Statement:** "In 2018, pretreatment sand filters were installed to sequester any excess dissolved iron or manganese and suspended solids, including biological material entering the system."

and,

"The sand filters remove excess dissolved metals by advanced oxidation processes that occur on the surface of catalytic media that causes the precipitation of metal oxides. Further description of these advanced oxidation processes is provided in Appendix I. The metal oxides are then captured by the filter and removed from the system via backwashing."

**NMED Comment:** Sand filters are capable of removing suspended solids from influent; however, they do not sequester dissolved iron and manganese. The latter statement suggests that the sand filters are combined with a water treatment unit capable of precipitating the dissolved metals. Please revise the former statement for clarity.

In addition, in the text of the revised O&M Plan, please explain how sequestration of the dissolved metals is accomplished.

#### **5. Section 1.2, Overall System Description, page 1-3**

**Permittee Statement:** “A schematic of the injection equipment in KAFB-7 and conceptual schematics of KAFB-106IN2 are provided in Appendix M.”

**NMED Comment:** Appendix M, *Well Construction Diagrams and Borehole Logs*, contains 128 pages of data. It is difficult to find the referenced schematics without page numbers. The relevant page numbers must be provided so that the information can easily be located. Please revise the O&M Plan accordingly.

#### **6. Section 1.3, Discharge Requirements, page 1-3**

**Permittee Statement:** “Applicable state permits pertaining to GWTS effluent discharge are provided in Appendix A.”

**NMED Comment:** Appendix A, *Permits and Agreements*, contains 445 pages of information. Some documents included in Appendix A are not pertinent to GWTS effluent discharge. Please provide page numbers to Appendix A and identify the relevant page numbers.

#### **7. Section 1.3, Discharge Requirements, page 1-3**

**Permittee Statement:** “Appendix C within the DP-1839 permit provides corrective actions to be enacted in the event of an exceedance of the discharge criteria.”

**NMED Comment:** Please provide a discussion of the corrective actions that will be implemented in the event of an exceedance of the discharge criteria in the text of the revised O&M Plan. In addition, include a copy of the DP-1839 permit in an appendix section of the revised O&M Plan.

#### **8. Section 2.3, Influent Tank, Pumps, and Pretreatment Sand Filters, page 2-3**

**Permittee Statement:** “The system issues an alarm through the SCADA that backwash is occurring, and backwash water is transferred and stored in a clarifier located on top of the

truck sump outside of the GWTS.”

**NMED Comment:** Section 7.4, *Backwash Water*, page 7-3, states that the backwash water is disposed through the GWTS. The backwash water may contain microbes that are responsible for fouling. If the backwash water is reapplied and treated through the GWTS, the water must be disinfected so that the microbes will not contaminate the adsorber beds. In addition, backwashing may desorb soluble contaminants such as EDB. Please clarify whether adsorbed EDB is potentially desorbed from the beds at the time of backwashing, and if so, explain what measures are taken to address the issue in the revised O&M Plan.

#### 9. Section 2.3, Influent Tank, Pumps, and Pretreatment Sand Filters, page 2-3

**Permittee Statement:** “The sodium hypochlorite maintains the function of the sand filters and disinfects the sand filter media and water, which minimizes the need to skim or backwash the granular activated carbon (GAC) vessels due to the formation of biofouling.”

**NMED Comment:** Application of free chlorine may generate undesirable byproducts and shorten the usable lifetime of GAC. Please explain whether any monitoring, control, or countermeasures for formation of undesirable byproducts have been implemented in the disinfection process in the revised O&M Plan, and if such measures have not been implemented, include appropriate measures in the revised O&M Plan, as necessary.

#### 10. Section 2.4, Carbon Vessels, page 2-4

**Permittee Statement:** “With this extended contact time, the lead carbon bed can lower an EDB concentration in 400 gpm of groundwater from 2 micrograms per liter to below the discharge limit.”

**NMED Comment:** Relatively high EDB concentrations (e.g., 820 µg/L in a groundwater sample collected from well KAFB-106153-484 during the November 1, 2019 sampling event) have been detected in groundwater samples. EDB concentrations at the influent of the carbon vessel have been lower than two µg/L; however, they may potentially exceed two µg/L if the extraction well network is optimized in the future. Please clarify whether the carbon vessels are capable of reducing higher influent EDB concentrations, and if so, provide the maximum EDB concentration that the GAC is capable of reducing to the discharge limit at the maximum loading rate in the revised O&M Plan. If there is a correlation between the loading rates and maximum treatable influent EDB concentrations, provide a figure that demonstrates the correlation in the revised O&M Plan.

In addition, other petroleum hydrocarbon constituents (e.g., benzene) are present in the groundwater. Please explain whether the carbon vessels are designed to handle petroleum hydrocarbon constituents in the revised O&M Plan. Appendix O, *Technical Memorandum*,

provides a discussion regarding the effectiveness of the carbon vessels; however, the 2016 data was used for the discussion. Clarify whether the 2016 data are still relevant to the current operation; otherwise, reevaluate the effectiveness of the carbon vessels using the most recent data. Furthermore, the discharge limit for each constituent is not provided in the text of the O&M Plan. Provide the discharge limits in the text of the revised O&M Plan.

#### **11. Section 2.4, Carbon Vessels, page 2-4**

**Permittee Statement:** “When water leaving the lead GAC vessel contains EDB concentrations of 90 percent of the effluent limit, that GAC vessel undergoes GAC change out and the lag carbon vessel is placed into the lead position.”

**NMED Comment:** EDB is not the only contaminant in the groundwater; petroleum hydrocarbon constituents (e.g., benzene) and metals (e.g., manganese) are present and were detected in influent samples previously. The lag carbon vessel must replace the lead position when water leaving the lead carbon vessel contains any regulated constituent at a concentration that is 90 percent of its respective effluent limit. Please include the provision in the revised O&M Plan.

#### **12. Section 2.6, Operation and Maintenance of Discharge Locations, page 2-5**

**Permittee Statement:** “The liner extends up the sides of the pond and the water level in the pond cannot not [sic] exceed the high-level set point of 5.5 feet with respect to the GCMP pump house transducer.”

**NMED Comment:** Since the information regarding the depth of the pond is not provided, it is not clear whether the high-level point of 5.5 feet can sufficiently prevent overfilling. A minimum of two-foot freeboard must be maintained to prevent overfilling. Please clarify if sufficient freeboard is maintained in the revised O&M Plan; otherwise, propose to change the high-level set point to maintain sufficient freeboard in the revised O&M Plan.

In addition, there is a typographical error in the statement (i.e., “cannot not”). Please correct the typographical error in the revised O&M Plan.

#### **13. Section 2.6, Operation and Maintenance of Discharge Locations, page 2-5**

**Permittee Statement:** “If this condition occurs, the effluent flow is redirected to KAFB-7, KAFB-106IN2, or a future UIC.”

**NMED Comment:** Section 2.6 also states, “[c]urrently, the GCMP and KAFB-7 are the only two approved discharge locations for treated effluent.” If well KAFB-106IN2 is installed, the Permittee must add information for the well to the next annual revision of the O&M Plan



(see Comment 2). No revision required.

**14. Section 2.9, Normal Shut Down Procedure and Section 2.10, Emergency Shutdown Procedure, page 2-8**

**NMED Comment:** A provision to close the valves for holding tanks is not included in the procedures. In order to prevent drainage from holding tanks at a time when the system is shut down, holding tanks must be isolated from the rest of the system. Please include a provision to close all valves located in the holding tanks.

**15. Section 3.3, Bag Filter Change-Out, page 3-1**

**Permittee Statement:** “Bag filters require replacement as needed to correct a pressure drop across the pre- and post-treatment bag filters... Once the Operator has deemed that a change-out is required, the system remains on and the Operator isolates the filter housing needing change-out.”

**NMED Comment:** Criteria that prompt the replacement of bag filters (e.g., pressure drop across the filters) are not specified in the statement. The criteria are discussed in different sections of the O&M Plan; however, they are not consistent. Please provide consistent criteria throughout the revised O&M Plan.

**16. Section 3.5, Discharge Changeover, page 3-2**

**Permittee Statement:** “Commute to the effluent changeover location shown on Figure 1-1 and close the valve where the system was previously discharging and open the valve leading to the new discharge location. It takes approximately 38.5 turns of each post indicator to completely close or open the resilient wedge gate valve.”

**NMED Comment:** The statement describes operating procedures in a manner which appears to be directions for field personnel. Please revise the O&M Plan to describe the procedures in a manner that provides a description rather than instructions.

**17. Section 3.6 Granular Activated Carbon Backwashing, Skimming, and Change-Out, page 3-3**

**Permittee Statement:** “Before initial startup and following each carbon change-out (prior to re-start), the carbon beds must be backwashed.”

**NMED Comment:** Backwashing of the carbon beds is proposed only at the time of startup and carbon change-out. Backwashing is essential to remove solids to maintain the desired hydraulic properties of the carbon beds and to minimize bacteria growth in the beds; therefore, backwashing should be conducted when the performance of the GAC starts to

decline. Performance criteria (e.g., pressure drop increase) for backwashing must be established although backwashing is not required on a routine basis. Please revise the O&M Plan accordingly.

**18. Section 3.6 Granular Activated Carbon Backwashing, Skimming, and Change-Out, page 3-3**

**Permittee Statement:** “Backwashing the TIGG carbon beds requires at least 700 gpm of clean water, which can be provided from the fire hydrant near the GWTS building.”

**NMED Comment:** Please clarify the source of fire hydrant water and how the quality of this water will be assured in the revised O&M Plan.

**19. Section 3.6 Granular Activated Carbon Backwashing, Skimming, and Change-Out, page 3-3**

**Permittee Statement:** “This tank doubles as a clarifier for settling out fines produced during the backwash process.”

**NMED Comment:** If the tank is used as a clarifier, please explain whether the tank and the backwash process is designed to assure detention time necessary to settle out fines during the backwash process in the revised O&M Plan.

**20. Section 3.7, Dosing Pump, Chlorine Analyzer, and Sodium Hypochlorite Generator Maintenance, pages 3-4 and 3-5**

**NMED Comment:** Detailed procedures in the event that the sodium hypochlorite generator is off-line for more than two weeks are described in Section 3.7. However, it is not necessary to include such details in the text of the O&M Plan. Please revise the O&M Plan to describe the procedures in a manner that provide a description rather than instructions (see Comment 16).

**21. Section 3.10, Effluent Line Integrity Testing, page 3-6**

**Permittee Statement:** “The [effluent] line must be tested in year one of DP-1839 approval (by April 28, 2018) and in year five of the approval before a renewal application is submitted (2022).”

**NMED Comment:** Please clarify whether the line was tested on or before April 28, 2018. If the line was tested, describe the conditions of the line at the time of testing or provide a reference to the submittal that describes the conditions. If the line was not tested, propose to conduct the test in the revised O&M Plan.

## 22. Section 3.11, Well Pump Pulling, page 3-6

**Permittee Statement:** “Extraction well pumps are pulled for inspection and maintenance only after a minimum of 10 years in the absence of documented performance issues.”

**NMED Comment:** Please provide a date for the upcoming inspection and maintenance for the extraction well pumps in the revised O&M Plan.

## 23. Section 3.11, Well Pump Pulling, page 3-7

**Permittee Statement:** “This example [500 gallons of calcium hypochlorite solution] is sufficient to initially produce a chlorine concentration of approximately 50 mg/L throughout the entire water column.”

**NMED Comment:** Unless the information regarding volume of groundwater present in each extraction well is provided, it would not be possible to verify whether the chlorine concentration reaches a minimum of 50 mg/L. Please provide an estimated volume of groundwater in each extraction well or present the calculation to demonstrate that the chlorine level exceeds 50 mg/L in each extraction well in the revised O&M Plan.

## 24. Section 3.11, Well Pump Pulling, page 3-7

**Permittee Statement:** “Other cathodic protection options may be considered.”

**NMED Comment:** Other cathodic protection options are not discussed in the section. Please remove the statement or provide a discussion for any optional methods in the revised O&M Plan.

## 25. Section 3.12.1, Well Disinfection, page 3-7

**Permittee Statement:** “Extraction and monitoring wells may occasionally require disinfection to improve pumping and monitoring performance. Well disinfection is performed by adding disinfectant directly to the well at the wellhead.”

**NMED Comment:** An addition of disinfectant directly into the extraction and monitoring wells may affect contaminant concentrations or oxidation of contaminants. Please explain whether the disinfection practice can affect analytical results in groundwater samples collected from these or neighboring wells. If the analytical results are not representative of formation water due to the practice, other measures must be taken to counter the effects disinfection may have on wells, or an alternative disinfection method must be used.

## 26. Section 3.14.1, Physical Cleaning, page 3-8

**Permittee Statements:** “A bailer with a toggle valve or equivalent is lowered into the well and used to gently surge the screen interval to remove any accumulated sand, silt, and debris accumulated in the well bore.”

and,

“Bailing is repeated until the discharged water has reached a set sediment volume per volume of water (e.g., less than 2 milliliters of sediment per 1 liter of water) measured using an Imhoff cone or equivalent.”

**NMED Comment:** The depth to water at the site is approximately 500 feet below ground surface (bgs). Please provide a description of how bailing is conducted in the revised O&M Plan.

## 27. Section 3.14.2, Chemical Cleaning, page 3-9

**Permittee Statement:** “Acid treatments may be used to remove and weaken existing biologic colonies and remove biologically-induced iron deposits and chemical crusts. Well acidification is performed using commercially available acid with inhibitors to minimize corrosive effects on metal components of the well (e.g., sulfamic acid, Dry Acid Special®).”

**NMED Comment:** The acid treatment of wells may inhibit biodegradation of EDB and hydrocarbon constituents if the solution used for the acid treatment migrates outside the well-casing. Please discuss how such treatment will be controlled to minimize this potential impact in the revised O&M Plan.

## 28. Section 3.12, Well and Conveyance Line Disinfection, Section 3.13, Well Shocking, and Section 3.14, Well Cleaning and Redevelopment

**NMED Comment:** In the revised O&M Plan, the Permittee must add a reference to the reporting of maintenance procedures that have been performed on the GWTS. This may be achieved by either referencing reports submitted to NMED where this information is contained, or the Permittee may include the information in an additional section in Appendix M, *Well Construction Diagrams and Borehole Logs*, where the original well development records are located.

## 29. Section 3.17, Flowmeter Verification Testing, page 3-11, and Section 3.19.2, Single Train Diversion, page 3-13

**Permittee Statements:** “Shut down a treatment train and its respective extraction wells (KAFB-106233 and KAFB- 106234 for Train 1; KAFB-106228 and KAFB-106239 for Train 2).”  
and,

“If only the wells from one train will be pumped into the other train (e.g., pumping KAFB-106228 and KAFB-106239 through Train 1, or pumping KAFB-106233 and KAFB-106234 through Train 2), isolate the wells not to be pumped through by closing the respective train’s valve below the influent tree bypass.”

**NMED Comment:** According to the information provided in Appendices D, page 6 of 83, and E, page 21 of 23, treatment trains do not appear to designate extraction wells. Train 1 influent designates extracted water discharged into Tank 110 and Train 2 influent designates extracted water discharged into Tank 210. However, the statements above indicate that each treatment train is specific to particular extraction wells. Please provide a clarification in the revised O&M Plan.

In addition, the designation of extraction wells for Train 1 and Train 2 is not consistent between the former and latter statements. Provide a clarification in the revised O&M Plan.

### **30. Section 3.19.1, Emergency Conveyance Line Repairs, page 3-12**

**Permittee Statement:** “If the influent conveyance line is damaged, a current contract in place holds that the subcontractor will follow a general guideline, which is summarized below.”

**NMED Comment:** A detailed emergency procedure to mitigate damaged influent conveyance lines is discussed. However, a procedure to mitigate damaged effluent conveyance lines is not included in the section. Please revise the O&M Plan to include the procedure to mitigate damaged effluent conveyance lines, as well.

### **31. Section 5, Process Monitoring, page 5-1**

**Permittee Statement:** “The analytical results are reviewed to confirm that the contaminant concentrations meet the discharge criteria provided in Appendix J.”

**NMED Comment:** According to Appendix J, Section J.1, *Discharge Requirements*, page J-1 of J-8, discharge criteria of EDB, benzene, ethylbenzene, toluene, total xylenes, iron, and manganese are specified. The quarterly monitoring reports only provide analytical results for these contaminant concentrations. However, other contaminants are present at the site and must be monitored as well. For example, according to the *Quarterly Monitoring Report – October – December 2019 and Annual Report for 2019*, dated March 2020, the concentrations of 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene in groundwater samples collected from wells KAFB-106S5-446, located close to extraction well KAFB-106239, exceeded the applicable screening levels. Similarly, the dissolved arsenic concentrations in groundwater samples collected from wells KAFB-106021 and KAFB-106055, located near extraction well KAFB-106233, exceeded the applicable screening level.

Since these contaminants are not currently monitored, propose to monitor the concentrations of 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, naphthalene, and dissolved arsenic in influent and effluent samples in future monitoring events. Please revise the O&M Plan accordingly.

### **32. Section 7.2.1, Non-Hazardous Water, page 7-2**

**Permittee Statement:** “At the discretion of the Operator, the unfiltered water may be run through a 50-, 10-, or 1-micron bag filter as a pretreatment step.”

**NMED Comment:** The discretion criteria used by the Operator is not identified. Please provide criteria used to select appropriate size of the filters in the revised O&M Plan.

In addition, Section 2.3, *Influent Tank, Pumps, and Pretreatment Sand Filters*, page 2-3, states, “[t]he pre-treatment bag filters on the GWTS influent pump skid are equipped with differential pressure transmitters (both pre-treatment and post-treatment bag filters are equipped with 10-micron bag filters),” and Section 3.3, *Bag Filter Change-Out*, page 3-1, states, “[t]wo bag filter housings are located on each skid with six 10-micron bag filters in each housing.” Sections 2.3 and 3.3 indicate that the filter size is set to be 10-micron. Please resolve the discrepancy or provide a clarification in the revised O&M Plan.

### **33. Section 7.3, Pre-Treatment pH Adjustment and Disinfection, page 7-3**

**Permittee Statement:** “Sodium hypochlorite solution (8.25 percent) is used for two pre-treatment processes: (1) injection as an oxidant, disinfectant upstream of the pre-treatment sand filters; and (2) to adjust the pH, disinfect investigation-derived waste monitoring network purge water prior to disposal.”

**NMED Comment:** Section 3.11, *Well Pump Pulling*, states, “[a]n example mix of solution could consist of 1 pound of 65percent dry granular, calcium hypochlorite and 500 gallons of clear water...” The solution prepared for well pump pulling contains lower hypochlorite concentration (less than 0.2%) relative to the concentration of sodium hypochlorite solution (8.25 percent) used for pretreatment processes. Please explain why a lower concentration of calcium hypochlorite solution is used to disinfect well casings in the revised O&M Plan.

### **34. Section 7.3.2, Investigation-Derived Waste Purge Water, page 7-3**

**Permittee Statement:** “When performing a pH adjustment or disinfection with sodium hypochlorite solution, ensure that the pH of the water being adjusted is continuously monitored.”

**NMED Comment:** Please provide the target range of pH for adjustment of the influent and

effluent water in the O&M Plan.

**35. Section 7.5, Depleted Granular Activated Carbon, page 7-4**

**Permittee Statement:** “Depleted GAC is removed from the GAC vessels and regenerated offsite by a third party for reuse in accordance with appropriate permits and regulations.”

**NMED Comment:** Section 6.5.7, *Collection and Management of Investigation Derived Waste [IDW]* of the RCRA Permit states, “[t]he Permittee shall include a description of the anticipated IDW management process as part of any work plan submitted to the Department for approval”. The O&M Plan however refers to the Permit for management of this waste. As required by the Permit, please provide a more detailed description of the management process for the depleted GAC in the revised O&M Plan.

**36. Table 1-1, Applicable Permits, page 2 of 2**

**NMED Comment:** The table indicates that the Christ United Methodist Church License to Kirtland Air Force Base, which allows for the entry and performance of tasks in and around extraction well KAFB-106228, has expired as of January 8, 2020. According to Figure 1-1, *Site Map*, this extraction well is at the leading edge of the EDB plume, and therefore key to the remedial activities associated with containment of the EDB plume. The Permittee must renew this license as soon as possible and provide proof to NMED that continued access to this well has been secured.

**37. Table 2-2, Permitted Extraction Well Flow Rates, page 1 of 1**

**NMED Comment:** The permitted injection rate for well KAFB-7 is recorded as 1,239 gpm in the table. Section 2.6, *Operation and Maintenance of Discharge Locations*, page 2-6, states that the maximum permitted injection rate is 1,000 gpm. Please resolve the discrepancy in the revised O&M Plan.

**38. Table 2-2, Permitted Extraction Well Flow Rates, page 1 of 1**

**NMED Comment:** The table presents the permitted maximum 24-hour continuous extraction flow rates in gallons per minute (gpm). The table must also provide the permitted maximum 24-hour extracted groundwater volume for each well. Please revise the table accordingly.

**39. Table 3-1, Groundwater Treatment System Routine Maintenance Schedule, page 1 of 2**

**NMED Comment:** According to Table 3-1, the inspections and maintenance of the Tijeras Arroyo Golf Course ponds are required on an as needed basis. However, the maintenance

and inspection activity at the location is scheduled semiannually according to Section 2.6, *Operation and Maintenance of Discharge Locations*, page 2-5. Please resolve the discrepancy in the revised O&M Plan.

**40. Table 5-1, Influent Criteria, page 1 of 1**

**NMED Comment:** The table presents the analytical suite for the influent samples; however, it does not present the analytical suite for the effluent samples. Please modify Table 5-1 or provide a separate table to present the analytical suite for effluent samples and the applicable screening level for each analyte.

**41. Table 5-1, Influent Criteria, page 1 of 1**

**NMED Comment:** The pH and dissolved oxygen levels are not specified as influent criteria. However, these parameters may influence the GAC performance. For example, the level of dissolved oxygen may affect the amount of biofouling and the pH level may affect the longevity of chlorine and the ability of the GAC to adsorb compounds. An optimal range of these parameters must be evaluated and presented in the revised table.

In addition, NMED's *Kirtland Air Force Base Bulk Fuel Facility Mid-Plume Pump and Treat System Basis of Design -Addendum #1*, dated December 16, 2015, approved the addition of the pH adjustment system for the GAC effluent. The O&M Plan does not include the operation and maintenance activities related to operation of the pH adjustment system. Please revise the O&M Plan to include the pH adjustment system operation and maintenance tasks.

**42. Table 6-1, Reports and Recipients, page 1 of 1**

**NMED Comment:** The Permittee must add a reporting time (e.g., within 24 hours, within 48 hours, etc.) in which to report a greater than 24-hour shut down and any changes in volume of discharge, location of discharge, or amount or character of contaminants received, treated, or discharged outside of the DP-1839 scope. In addition to the NMED Ground Water Quality Bureau, the Permittee must add the NMED Hazardous Waste Bureau to the "Notification of change in volume of discharge, location of discharge, or amount or character of contaminants received, treated, or discharged outside of DP-1839 scope." Please revise the O&M Plan accordingly.

**43. Appendix B, Organization and Responsibilities**

**NMED Comment:** Appendix B includes an organization chart. In the chart, no description is provided under NMED. Please clarify the chart to describe that NMED Hazardous Waste Bureau is the lead regulatory organization for the SWMUs in the revised O&M Plan.



#### **44. Appendix D, Process Drawings and Groundwater Treatment System Equipment/Instrument Location Pictures**

**NMED Comment:** Appendix D includes pictures of various parts and equipment of the system. Some pictures identify the parts and equipment with both descriptions and abbreviation/numbers as identified in the process flow diagrams. However, other pictures identify the parts and equipment with abbreviation/numbers (e.g., PSH-3218) only, with no descriptions. Therefore, it is not clear what parts and equipment are presented in the pictures. Please provide the descriptions of parts and equipment in each picture in the revised O&M Plan.

#### **45. Appendix F, Supervisory Control and Data Acquisition and Human Machine Interface Screens**

**NMED Comment:** Injection and extraction wells are designated with different nomenclature in Appendix F. Well designations must be consistent throughout the O&M Plan. Please revise the O&M Plan accordingly.

#### **46. Appendix F, Supervisory Control and Data Acquisition and Human Machine Interface Screens**

**NMED Comment:** Images of the computer screen are presented in Appendix F; however, an explanation is not provided for each screen image. Please provide an explanation for each image of the computer screen in the revised O&M Plan.

#### **47. Appendix G, Design Calculations for Carbon Vessel Media Beds, page 4**

**Permittee Statement:** “The additional contact time and carbon volume will be needed if dissolved gasoline range organics (GRO) from the downgradient plume are pulled into the extraction well.”

**NMED Comment:** The carbon adsorber design calculation was conducted based on a single contaminant, EDB. The presence of dissolved gasoline range organics was previously observed in the influent water (e.g., December 2015 sampling event) but not detected in recent sampling events (e.g., November 2019). It is possible that hydrocarbon constituents may reappear in the process stream in the future. Provisions must be included in the O&M Plan to re-evaluate the effectiveness of the current carbon adsorber design should this occur. Please revise the O&M Plan accordingly.

#### **48. Appendix K, Waste Characterization Documentation**

**NMED Comment:** Although it appears that disposal of bag filters was approved by the June 9, 2016 email correspondence from Mr. Sampler of US Army Corps of Engineers that states, “[w]e spoke with Katrina and she is good with us throwing the bag filters away. There is no official reply. Consider this your approval to put used bag filters in the dumpster.” Spent filters may contain EDB and other hazardous constituents. The basis for the approval is not described in the email correspondence. Please provide a basis for managing the bag filters in this manner in the response letter.

#### **49. Appendix N, Example Reports, Recipients**

**NMED Comment:** The Permittee provides copies of email addresses for the recipients. It is not clear to whom and what organizations these emails were addressed. In the revised O&M Plan, please provide a list of individual recipient names and the organizations that he or she represent.

#### **50. Appendix O, Technical Memorandum**

**NMED Comment:** The cover pages for Attachments 3B, *Raw Model Outputs*, and Attachment 3C, *Source Model Code and AQUASIM Manual*, state that they are “[p]rovided on Compact Disk”. The attachments were not included on the compact disks provided with the O&M Plan. Please include these missing attachments with the revised O&M Plan.

#### **51. Appendix O, Technical Memorandum, Figure 1, GWTS Process Flow Diagram**

**NMED Comment:** Figure 1 indicates that the lead and lag GAC vessels are used in series; however, the process flow diagram included in Appendices D and F indicate that these vessels are used in parallel and Section 2.4, *Carbon Vessels*, page 2-4, indicates that the lead GAC is bypassed and the lag GAC replaces it at a time when breakthrough occurs from the lead GAC. Please provide a clarification in the response letter and correct Figure 1 in the revised O&M Plan, as appropriate.