



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

RECEIVED



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MAR 05 2018




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

Dear Mr. Kieling

Attached please find the *Standard Operating Procedure for Effluent Conveyance Line Integrity Testing of the Groundwater Treatment System*. This procedure has been prepared to summarize the testing approach proposed to ensure compliance with Condition 15 of the Discharge Permit DP-1839 associated with the discharge of treated water from the groundwater treatment system at ST-106/SS-111.

If you have any questions or concerns, please contact Mr. Scott Clark at (505) 846-9017 or at scott.clark@us.af.mil or Holly O'Grady at (505) 853-3484 or at holly.ogradey@us.af.mil.

Sincerely


DAWN A. NICKELL, Colonel, USAF
Vice Commander

Attachment:

Standard Operating Procedure for Effluent Conveyance Line Integrity Testing of the Groundwater Treatment System; 2 Hard Copies/2 CDs

cc:

NMED (Borrego) letter
NMED GWQB (McQuillan, Hunter), letter and CD
EPA Region 6 (King, Ellinger), letter and CD
COA (Faris), letter and CD
ABCWUA (Shean), letter and CD
SAF-IEE (Lynnes), electronic only
AFCEC/CZ (Renaghan, Clark, O'Grady), electronic only
USACE-ABQ District Office (Simpler, Phaneuf, Dreeland, Sanchez, Salazar), electronic only
Public Info Repository, Administrative Record/Information Repository (AR/IR) and File

KAFB4649



Standard Operating Procedure for Effluent Conveyance Line Integrity Testing of the Groundwater Treatment System

Revision 0
March 2018

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- 1 Effluent Conveyance Line Test Section and Isolation Valves

ATTACHMENTS

- 1 Hydrostatic Pressure Testing Form

DOCUMENT REVISION HISTORY

ORIGINAL (MASTER) DOCUMENT REVISION HISTORY				
Revision Number	Revision Date	Revision Summary	Revised By	Reviewed By
0	2/8/2018	Created Standard Operating Procedure	K. McKeage	T. Curley

1. SCOPE AND APPLICATION

The purpose of this Standard Operating Procedure is to delineate protocols for performing effluent conveyance line integrity testing at the Kirtland Air Force Base groundwater treatment system (GWTS) in accordance with Discharge Permit (DP)-1839 (New Mexico Environment Department, 2017; Condition Number [No.] 15). Condition No. 15 of DP-1839 states the following:

The Permittee shall ensure the treated effluent conveyance system, i.e., piping, between the GWTS and the UIC well(s) does not leak and shall report any such leakage to the NMED GWQB in accordance with 20.6.2.1203(A) NMAC and copy the NMED HWB. Within 1 year of the effective date of this Discharge Permit, the Permittee shall demonstrate the structural integrity of the treated effluent conveyance system between the GWTS and KAFB-7. Prior to testing, the Permittee shall propose for NMED approval the test method to be used. The results of the mechanical integrity testing shall be submitted to NMED within 60 days of test completion. The Permittee shall integrity test the treated effluent conveyance system between GWTS and the UIC well(s) prior to submitting a permit renewal application.

The line must be tested within year one of DP-1839 approval (by April 28, 2018) and in year five of the approval before a renewal application is submitted (2022).

Hydrostatic specified test pressure (STP) is recommended at 150 percent (%) of operating pressure per American Society of Mechanical Engineers (ASME) B31.3 Part 345 and will be measured at gauge PI-3208 on the effluent skid No. 2. The current operating pressure in the effluent conveyance line is approximately 12 pounds per square inch (psi) with a high pressure alarm at 45 psi; thus, an STP of 50 psi has been specified for this test (10% higher than the high pressure alarm set point). The final pressure will be compared to the STP at the end of the test period. ASTM International F2164 – 13 defines a hydrostatic pressure test as acceptable if the final pressure does not deviate by more than 30% from the STP reading (± 15 psi for this test). The results of the hydrostatic test will be included in the test report. Although the ASTM International F2164 – 13 method requires an air volume and rebound assessment for the installation of new, uniform piping, these assessments will not be performed due to the varying pipe thicknesses, types, and age of the pipes that comprise the effluent conveyance line.

2. EQUIPMENT AND MATERIALS

The following equipment and materials may be required:

- Valve stem for actuating flush-mounted valves along KAFB-7 effluent conveyance line.
- 50-foot garden hose
- Field logbook

- Indelible ink pen
- Manhole cover hook to open effluent conveyance line vaults
- Camera.

3. PROCEDURE

Effluent conveyance line integrity testing is performed by hydrostatic leak testing the line. To perform the test, the GWTS needs to be shut down prior to performing these tests. Refer to the GWTS Operations and Maintenance Plan (U.S. Army Corps of Engineers, 2016) or most current approved version to successfully shut down the system. Ensure the effluent skid pumps are placed into manual mode on their variable frequency drives (VFDs) to prevent accidental remote startup.

Hydrostatic testing is performed following the steps outlined below:

1. The sampling port on train 2 is adapted to accept a male 5/8-inch garden hose fitting.
2. The effluent conveyance line should be filled with water by closing all air relief valves (ARVs) and manually operating the effluent pumps to discharge water to the golf course pond with both changeover valves open. The effluent pump is then shut down and the changeover valve leading to the golf course and isolation valve at KAFB-7 (Figure 1) are then immediately closed. The vacuum within the effluent conveyance line should siphon water from the effluent tank to fill the line.
3. The effluent conveyance line may now be isolated to perform testing. To isolate the line, the effluent skid butterfly valves on both treatment trains are closed. Ensure the changeover valve to the golf course is closed, the changeover valve to KAFB-7 is opened, and the isolation valve immediately upstream of the KAFB-7 flowmeter is closed (Figure 1). Verify all effluent conveyance line ARVs have been closed. The effluent flow control valve located on the GWTS effluent pipe tree is then manually opened to 100% open. The effluent conveyance line has now been isolated and testing can proceed.
4. A garden hose is connected to the 100-psi Base supply water line located on the south wall of the GWTS. Evacuate all air from the hose prior to connecting it to the adapted sampling port.
5. During the initial pressurization, the ARV located on the effluent conveyance line within the GWTS shall be opened to vent any remaining air from the effluent conveyance line. If air venting is observed from the ARV then additional water shall be pumped into the line by manually operating one of the effluent skid pumps, at a low VFD frequency. This process shall continue until no air venting is observed out of the ARV. If pressurization still cannot be obtained then it is likely that excess air is entrained at a high point within

the line; in which case each ARV along the effluent line (starting at KAFB Well 7 and working upstream towards the GWTS) will have to be opened to bleed air. Any time air is bled from the line additional water shall have to added using the effluent skid pump or base supply line depending on the volume needed. All ARVs and butterfly valves shall be closed prior to reattempting the initial pressurization. Once all of the air has been flushed from the line, fresh water from the 100-psi line is then introduced into the effluent conveyance line to a set pressure of 50 psi. The line pressure is monitored on an existing gauge provided on the train 2 skid. The addition of water is controlled using an existing ball valve located between the adapted sampling port and the effluent conveyance line.

6. The effluent conveyance line is then given 30 minutes to allow expansion of the high density polyethylene in response to the set pressure. Successive additions of water can be performed during this time to ensure that the set pressure is maintained at 50 psi.
7. The pressure is then monitored for 1 hour, during which GWTS personnel will visually inspect the effluent conveyance line (where exposed) to ensure that the line is not leaking. All visual observations will be included in the test report.
8. Following the 1 hour of monitoring, the final pressure will be compared to the set pressure. Test results and observations will be recorded on the testing form (Attachment 1) and provided in the test report submitted to the U.S. Air Force for final evaluation.
9. The effluent conveyance line is then reinstated into operation by opening the effluent skid butterfly valves on both treatment trains, the isolation valve upstream of the KAFB-7 flowmeter, all effluent conveyance line ARVs, and selecting an appropriate discharge location with the changeover valves. The effluent pumps are then returned to automatic control and the GWTS is restarted per the GWTS Operations and Maintenance Plan (U.S. Army Corps of Engineers, 2016) or most current approved version.

4. MAINTENANCE

Not applicable.

5. PRECAUTIONS

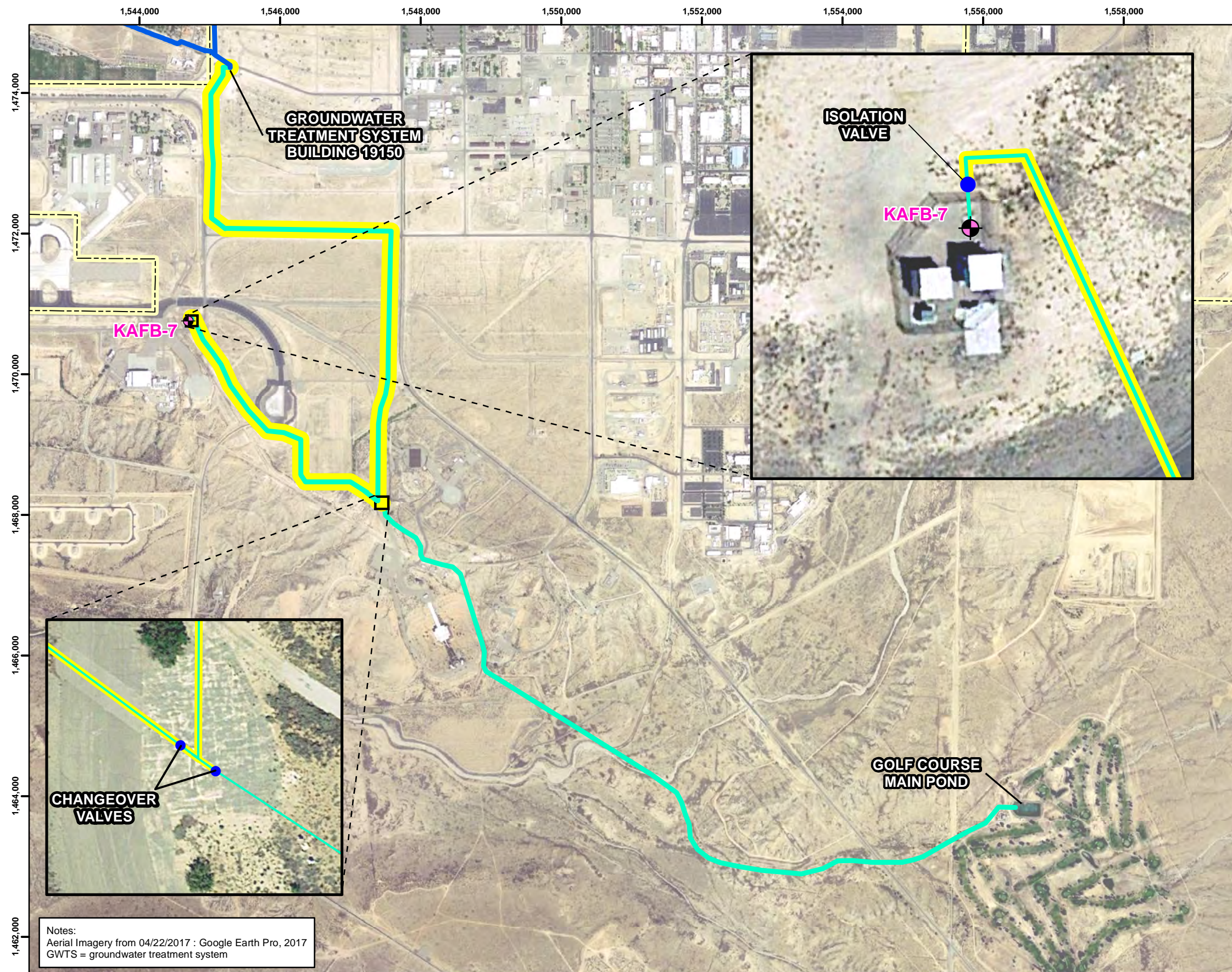
Ensure the GWTS has been fully shut down prior to pressure testing and confirm that the effluent skid pump VFDs are in manual mode prior to isolating the effluent conveyance line. Review the appropriate sections of any relevant safety documentation (i.e., an Accident Prevention Plan).

6. REFERENCES

- American Society of Mechanical Engineers (ASME) B31.3 Part 345. *Process Piping, Inspection, Examination, and Testing*. ASME. New York, NY. 2016
- ASTM International F2164 – 13. *Standard Practice for Field Leak Testing of Polyethylene (PE) and Crosslinked Polyethylene (PEX) Pressure Piping Systems Using Hydrostatic Pressure*. ASTM International. West Conshohocken, PA. 2013.
- New Mexico Environment Department. 2017. Correspondence from Michelle Hunter, Chief, Ground Water Quality Bureau to Colonel Eric. H. Froehlich, Base Commander, Kirtland AFB, New Mexico, Regarding Discharge Permit Issuance, DP-1839, Kirtland Air Force Base. April 28.
- U.S. Army Corps of Engineers. 2016. *Operations and Maintenance Plan, Groundwater Treatment System – Annual Update, Bulk Fuels Facility, SWMU ST-106/SS-111, Kirtland Air Force Base, New Mexico*. Prepared by EA Engineering, Science, and Technology, Inc., PBC for the USACE–Albuquerque District under USACE Contract No. W912DR-12-D-0006. August.

FIGURES

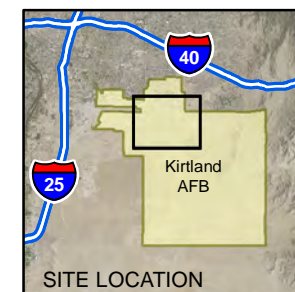
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Notes:
Aerial Imagery from 04/22/2017 : Google Earth Pro, 2017
GWTS = groundwater treatment system

Legend

- Injection Well
- GWTS Effluent Piping to be Tested
- GWTS Effluent Piping
- GWTS Influent Piping
- Installation Boundary



0 750 1,500 3,000
Feet
1 inch = 1,500 feet

Projection: NAD83 State Plane New Mexico Central FIPS3002 Feet

STANDARD OPERATING PROCEDURE FOR
EFFLUENT LINE INTEGRITY TESTING OF THE
GROUNDWATER TREATMENT SYSTEM
BULK FUELS FACILITY
SOLID WASTE MANAGEMENT UNIT ST-106/SS-111
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE 1

EFFLUENT CONVEYANCE LINE TEST
SECTION AND ISOLATION VALVES

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ATTACHMENTS

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HYDROSTATIC PRESSURE TESTING FORM

Project: GWTS Effluent Conveyance Line

EA Project No: 62599DM01

Date: _____

Air Temperature: _____

Time: _____

Length of Pipe Tested: _____

Type of Pipe Tested: _____

Location of Pipe Tested: _____

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Testing Procedure

Piping shall be vented and then brought to the STP and held at the STP by providing successive injections of makeup water. Piping shall then be subjected for 1 hour to a hydrostatic test pressure of 50 psi. No additional makeup water will be added during this period. Exposed pipe, joints, fittings, and valves shall be carefully examined for leaks. Record testing results below and compare the final pressure to the STP.

Testing Results

Initial pressure reading after 30-minute makeup period: _____

Pressure reading after 1 hour: _____

Difference in pressure: _____

Final Pressure within 30% of STP? _____

Are there any leaks present? _____

Additional testing comments: _____

Signature:

Testing Operator

Date

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