



FOSTER WHEELER ENVIRONMENTAL CORPORATION

2000
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June 12, 2000
TERC-015.009-00X-003

Mr. George Fish
U.S. Army Corps of Engineers
Albuquerque District
P.O. Box Drawer A
Holloman AFB, NM 88330

Subject: TERC Contract No. DACW-45-94-D-0003, Delivery Order 15, WAD 09;
AF Project No. KWRD977017; Final Completion Report for the Stormwater
Drainage Construction Project at the Former Sewage Lagoons Closure Site at
Holloman AFB, New Mexico

Dear Mr. Fish:

Foster Wheeler Environmental Corporation is pleased to submit two (2) copies of the Final Completion Report and comment/resolution sheet for the Stormwater Drainage Construction Project at the Former Sewage Lagoons Closure Site at Holloman AFB, New Mexico. This final report summarizes and provides completion documentation for the construction activities performed at the site and the additional work performed after the submission of the previous completion report on February 3, 2000. This Final Completion Report includes the Record Drawing from the Sewage Lagoons Closure Report that has been revised in accordance with NMED comments to include annotation of the coordinate system and inclusion of the permanent surveying benchmarks for the project. The report has been revised in accordance with comments provided by Holloman Air Force Base and includes additional detail on the construction of the maintenance road, bollards, and other site work performed since submission of the previous completion report. Revegetation will be performed in June 2000. New site photos of the completed work have also been included in the report.

If you have any questions or comments regarding the enclosed Final Completion Report, please contact me at (303) 980-3685.

Sincerely,
Foster Wheeler Environmental Corporation

Daniel C. Shea, P.E.
Task Manager, Holloman AFB

DS/gkp/lm
Enclosure



cc: J. Gallegos/USAF, Holloman AFB (3 copies)
G. Keepper/EPA (1 copy)
S. Kruse/NMED-HRMB (1 copy)
T. Zink/USACE, Omaha (2 copies)
D. Johnson/FWENC, Albuquerque (1 copy)
J. Morning/FWENC, Holloman AFB (1 copy)
S. Seyedian/FWENC, Denver (w/o attachments)
TERC-4 Program File (1 copy)



6/12/2000
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**FINAL COMPLETION REPORT
FOR THE STORMWATER DRAINAGE CONSTRUCTION PROJECT
AT THE FORMER SEWAGE LAGOONS CLOSURE SITE**

Prepared for:

49 CES/CEV
Holloman Air Force Base
and
HQ ACC CES/ESV
Langley Air Force Base, Virginia

Prepared by:

Foster Wheeler Environmental Corporation
143 Union Boulevard, Suite 1010
Lakewood, Colorado 80228-1824

Under Contract No. DACW-45-94-D-0003

Delivery Order 15, Work Authorization Directive 09

U.S. Army Corps of Engineers
Omaha District
Omaha, Nebraska

June 2000

Project Number: KWRD977017

Completion Report for the Stormwater Drainage Construction Project
at the Former Sewage Lagoons Closure Site at
Holloman AFB, New Mexico

1.0 INTRODUCTION AND PURPOSE

This Completion Report summarizes the activities conducted for the Stormwater Drainage Construction Project at the Former Sewage Lagoons Closure Site at Holloman Air Force Base (AFB), New Mexico. The construction of the drainage system was performed between October 1999 and January 2000 in accordance with the Stormwater Drainage Design Plan for the Northwestern Portion of the Sewage Lagoons Closure Site at Holloman AFB dated July 16, 1999. Site revegetation will be completed in June 2000. The record drawing for the Stormwater Drainage Construction Project is enclosed in Appendix C and the record drawing for the Former Sewage Lagoons Closure Site is enclosed in Appendix D.

This drainage system is designed to minimize surface water ponding in the northern portion of the Sewage Lagoons area and collect and convey stormwater runoff in a timely manner.

Components of the drainage system include the following:

- 250 feet (ft) of 12-inch (in) perforated polyvinyl chloride (PVC) (Schedule 40) pipe and gravel envelope (extending to the surface) at the inlet portion of the drainage line to collect stormwater in the northern portion of the site;
- 2,550 ft of 12-in perforated PVC (Schedule 40) pipe and gravel envelope (below surface) to convey runoff along the western portion of the site into the low-lying lake area in the southwestern portion of the site;
- eight PVC cleanouts, placed at 350-ft intervals along the piping alignment, to allow for routine maintenance/cleaning of the drainage line;
- a 12-in-thick riprap apron, located at the outlet of the drainage line, to provide erosion protection for the existing outlet channel in the southwestern portion of the site; and
- bollards, placed at the inlet portion, at each cleanout, and outlet portion of the pipe to prevent damage to the drainage system from any unexpected vehicular traffic.

2.0 SUMMARY OF CONSTRUCTION ACTIVITY

On November 2, 1999, Foster Wheeler Environmental Corporation (Foster Wheeler) obtained a Base Civil Engineering Work Clearance Request (excavation permit) for the site. Survey and staking activities were conducted and materials were received and inspected. A preparatory inspection was performed on November 8, 1999 (see Appendix A). All materials met the requirements of the Design Plan, and the field engineer approved the surveyor's grade staking of the piping alignment. Excavation activities began November 10, 1999, and were completed December 12, 1999. Revegetation of the site will be completed in June 2000. All construction activities were conducted in accordance with the approved Stormwater Drainage Design Plan (Foster Wheeler, 1999). A final inspection of the construction was performed on January 19, 2000 (see Appendix B).

Construction of the drainage pipe system was performed according to the following sequence of tasks:

1. Mobilization of the project occurred on November 1, 1999, including
 - delivery of equipment, materials, and supplies to the site;
 - designation of work zones;
 - coordination with the facility points-of-contact to minimize disturbance to ongoing operations; and
 - performance of site-specific orientation and health and safety training of the workers.
2. The area required for the construction of the piping alignment was cleared and grubbed of vegetation.
3. The surveyor(s) staked the piping alignment.
4. The trench was excavated.
5. 8-ounce (oz) non-woven geotextile filter fabric and ¾-in gravel was installed in the trench.
6. The grade of the gravel base was then set and verified in accordance with design specifications.
7. 2,850 ft of perforated 12-in PVC (Schedule 40) pipe and eight 8-in cleanouts were installed in accordance with design specifications.
8. The trench was backfilled with gravel to the top of the pipe, and the filter fabric was then folded and overlapped in accordance with design specifications.
9. The 250-ft section of trench at the inlet portion of the pipe was completely backfilled with gravel from the top of the filter fabric to the surrounding ground surface. The remainder of the trench was backfilled from the top of the filter fabric to the ground surface with 8-in lifts of loose soil, then compacted with a tamper to the level of the surrounding grade.
10. To prevent soil erosion, a 12-in-thick riprap apron composed of crushed concrete was installed over the filter fabric at the pipe outlet area in accordance with design specifications. Temporary silt fencing was installed in the area surrounding the intake portion of the pipe.
11. A road along the length of the drainage pipe was constructed for maintenance purposes. The 12-ft-wide road consists of a 6-in base coarse obtained from the reuse area. The road follows the drainage pipe on the west side of the cleanouts from the northern end of the lagoons to the outlet.
12. Final grading of the site was completed. Revegetation of the site will be completed in June 2000. This will be accomplished by disking a woodchip/compost mixture into the soil followed by the broadcast of seed mix. The revegetated areas will be watered twice per week until the rainy season arrives in July or until the vegetation takes hold.
13. Fourteen steel bollards were placed in concrete foundations at the intake portion, two bollards at each cleanout location along the length of the pipe, and seven bollards at the outlet portion of the pipe. A ¼-in steel cable was run through the bollards around the inlet and outlet to control vehicular travel. Necessary signage was also installed at the inlet, outlet, and each cleanout location to show the location of the buried pipe.
14. 100 tons of 1½-in gravel was placed around the inlet at a 20-ft radius and 200 feet upstream of the inlet for both filtering and erosion prevention purposes. The silt fences were then removed.
15. The site was demobilized, including:

- final inspection by representatives of the United States Air Force and United States Army Corps of Engineers (USACE) (see Appendix B for a copy of the Completion Inspection Report), and
- removal of equipment and excess materials from the site.

Table 1 summarizes the materials used in the construction of the drainage system.

Table 1: Summary of Construction Materials

Item	Quantity	Description
Gravel	850 tons	¾-in
Gravel	100 tons	1½-in
Filter fabric	3,600 sq yd	8-oz non-woven geotextile
Pipe	2,850 ft	Perforated 12-in PVC (Schedule 40)
Riprap	3 tons	4-in to 8-in stone
Bollards	37	Steel with concrete foundations
Cleanouts	8	8-in diameter

The following equipment was used to perform the construction activities:

- John Deere 444 Loader
- 6-cubic-yard Ford dump truck
- John Deere 490 Excavator
- Ford F-150 Truck and 15-ft trailer
- Bobcat 820 Loader
- Tamper Compactor
- Sokkia Laser Survey Equipment

Field engineering and quality control were performed under the direction of the Site Manager in accordance to the Stormwater Drainage Design Plan. Daily Quality Control Reports (DQCRs) were prepared and submitted to the USACE throughout the duration of the project, and therefore are not included in this Completion Report.

All aspects of health and safety for the project were performed in accordance with the approved Site Safety and Health Plan for the Sewage Lagoons Final Cover Project (Foster Wheeler, 1997) and the Final Basewide Health and Safety Plan (Ebasco, 1995). The Site Manager/Environmental Safety Specialist ensured that all workers complied with these procedures during the project activities.

3.0 CONCLUSIONS AND RECOMMENDATIONS

All construction activities were performed in accordance with the specifications stipulated in the Stormwater Drainage Design Plan dated July 16, 1999. The construction of the drainage system was successfully completed and the final inspection and approval of the construction occurred on January 19, 2000. A record drawing for the stormwater drainage construction is included in Appendix C. The record drawing for the former sewage lagoons closure site is included in Appendix D. Photographs of the site are included in Appendix E.

4.0 REFERENCES

Ebasco (Ebasco Services, Incorporated)

1995 Final Basewide Health and Safety Plan, Holloman Air Force Base, New Mexico.

Foster Wheeler (Foster Wheeler Environmental Corporation)

1997 Site Safety and Health Plan for the Sewage Lagoons Final Cover Project,
Holloman Air Force Base, New Mexico. June.

1999 Stormwater Drainage Design Plan for the Northwestern Portion of the Sewage
Lagoons Closure Site, Holloman Air Force Base, New Mexico. July.

APPENDIX A
Preparatory Inspection Report

**FOSTER WHEELER ENVIRONMENTAL
SEWAGE LAGOON, BLDG. DRAINAGE PROJECT
TERC Contract No. DACW45-94-D0003
HOLLOMAN AFB, NEW MEXICO**

PREPARATORY INSPECTION

PERSONNEL PRESENT:

NAME	REPRESENTING	TITLE	DATE
Dan Shea	FWENC	Engineer	11/8/99
James Morning	FWENC	Site Mgr/QC	11/8/99

SPECIFICATIONS:

PVC pipe size, Geo textile Cloth Weight, Survey layout

INSPECTION ITEMS:

Pipe-OK Cloth - OK Survey Staking -OK

JD 490 Excavator -OK

Storage of Materials -OK

OBSERVATIONS/DISCREPANCIES:

Site still muddy on north end

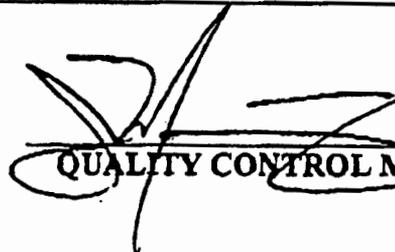
COMPLETENESS/QUALITY OF WORK:

OK

COMMENTS:

NONE

11/8/99
DATE


QUALITY CONTROL MANAGER

APPENDIX B
Completion Inspection Report

FOSTER WHEELER ENVIRONMENTAL
SEWAGE LAGOON, BLDG. DRAINAGE IMPROVMENTS
TERC Contract No. DACW45-94-D0003
HOLLOMAN AFB, NEW MEXICO

COMPLETION INSPECTION

PERSONNEL PRESENT:

NAME	REPRESENTING	TITLE	DATE
G Fish	USACE	Engineer	1-5-2000
J Gallegos	USAF	Section Chief	1-5-2000
C Fesmire	USAF	IRP Chief	1-5-2000
J Morning	FWENC	Site Mgr	1-5-19-2000
F. Fisher	USAF	Chief	1-19-2000

SPECIFICATIONS:

See attached plan

INSPECTION ITEMS:

Site restoration
Installation of system

OBSERVATIONS/DISCREPANCIES:

NONE - OK

COMPLETENESS/QUALITY OF WORK:

Awaiting spring for re-veg

COMMENTS:

Pull Silt Fence After 2-RAIN EVENTS
Submit Completion DRAWING - OK

1/19/2000
DATE


QUALITY CONTROL MANAGER

APPENDIX C
Record Drawing for Stormwater Drainage Construction

**TO VIEW THE MAP AND/OR
MAPS WITH THIS DOCUMENT,
PLEASE CALL THE
HAZARDOUS WASTE BUREAU
AT 505-476-6000 TO MAKE AN
APPOINTMENT**

APPENDIX D
Record Drawing for the Former Sewage Lagoons Closure Site

APPENDIX E
Site Photos



Photo 1. Sewage Lagoons Drainage Construction – Looking south along maintenance road and pipe (note protective bollards around the cleanout). 5/19/2000



Photo 2. Sewage Lagoons Drainage Construction – Looking southwest over the riprap apron at the outlet portion of the piping alignment (note the protective bollards and steel cable). 5/19/2000



Photo 3. Sewage Lagoons Drainage Construction – Looking southward at the upstream and intake portions of the pipe (note protective bollards and steel cables). 5/19/2000



Photo 4. Sewage Lagoons Drainage Construction – Looking east across the intake portion of the piping alignment from the inlet. 5/19/2000



Photo 5. Sewage Lagoons Drainage Construction – Looking west across cul de sac at the outlet of the piping alignment. 5/19/2000



Photo 6. Sewage Lagoons Drainage Construction – North end of maintenance road along piping alignment. 5/19/2000