Agro-Enviro Consultants, Inc.

Integrated Watershed Management

263 Cirque Drive• Bozeman, MT 59718• (406) 582-9034• Fax (406) 582-0847
email agroenviro@earthlink.net

On-Site Wetland Treatment Systems at South Fork Lodge (*)

R. Gene Gilbert, Ph. D., Agro-Enviro Consultants, Inc., Bozeman, MT
Gary Marshall, PE, Mountain River Engineering, Inc., Idaho Falls, ID

WATER POLICY INTERIM COMM.
APRIL 29, 2008
EXHIBIT 8

Agro-Enviro Consultants, Inc.

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ABSTRACT

On-Site Wetland Treatment Systems at South Fork Lodge (*)

R. Gene Gilbert, PhD., Agro-Enviro Consultants, Inc., Bozeman, MT
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The South Fork Lodge Resort is located on the banks of the South Fork of the Snake River near Swan Valley, Idaho. Construction on the site was started in fall of 1998. The on-site Wetland Sewage Treatment Systems (WSTS) were installed on two (2) cabin facilities with five lodging units each in May and June 1999. The cabin facilities opened for operation on July 4, 1999. The Permit obtained from District Seven Health Department, Idaho Falls, Idaho was "Experimental" subject to the necessary regulatory requirement for experimental on-site sewage treatment systems in Idaho. The WSTS were designed in accordance with the standard prescription engineering criteria for 1000 gpd of flow with required detention times throughout the system. The WSTS is a Patented Wetland Subsurface Treatment System that provided for optimal anaerobic microbial decomposition biosolids, producing a treated effluent with low double to single digit BOD and TSS values. However, a required by-pass default subsurface sand filter was installed under the wetland cell in the event the WSTS might fail. The two (2) year monitoring required for the cabin facilities was completed in the November 2001. The monitoring program was designed to specifically document the performance and efficiency of the WSTS. The following physical, chemical, and biological parameters were monitored: Quantity of flow (gal/dose) into and out of the WSTS, winter temperatures throughout the complete on-site system, groundwater level annual cycles; and, Fecal Coliform, ammonium-N, nitrite/nitrate-N, TKN, ortho-phosphate, total phosphate, oil & grease, COD, BOD, and TSS. All samples were collected using a patented water-sampling device that eliminated cross contamination of samples obtained from several sites. All samples were delivered within 24-36 hrs to a Certified Chemical and Biological Analysis Laboratory in Boise, Idaho. The routine sampling sites included: Septic tanks, wetland inlet, wetland outlet, sand-filter outlet, and groundwater well sites adjacent to the WSTS. The frequency of sampling was at least four (4) times annually during the most active periods of occupancy and operation from May to October. Winter periods of operation from mid-December to mid-March were monitored for flows and temperatures in the WSTS. The benefits of centralized management for decentralized on-site systems will be discussed. The results demonstrating performance and efficiency of the WSTS will be presented and discussed. The results presented are intended to provide technical assistance for the development of monitoring criteria and for technical approval of WSTS performance standards in the State of Idaho.

(*) Presentation for Idaho Environmental Health Annual Conference, March 13-15, 2002 in Boise, ID at WestCoast Park Center Suites. Presentation scheduled: 11:00-11:50am, March 15, 2002.

Description of Pictures

Operational System

1. Wetland Sewage Treatment System (WSTS) construction was completed in 4 to 5 days. The WSTS was planted with wetland plants from the local area within 3-5 weeks after starting operation.

2. The WSTS, show in Picture 1 above, after 1-½ years of operation has been incorporated into the landscape design for the site located near Swan Valley, Idaho.

3. The WSTS showing the growth and development of wetland plants during the first year of operation at the site.

4. The operational WSTS occupies a small surface footprint and provides environmental and aesthetic landscaping benefits for the site.

Construction Stages

5. The WSTS site was excavated and the soil shaped/formed prior to placement of the clay liner material on the bottom of the wetland cell.

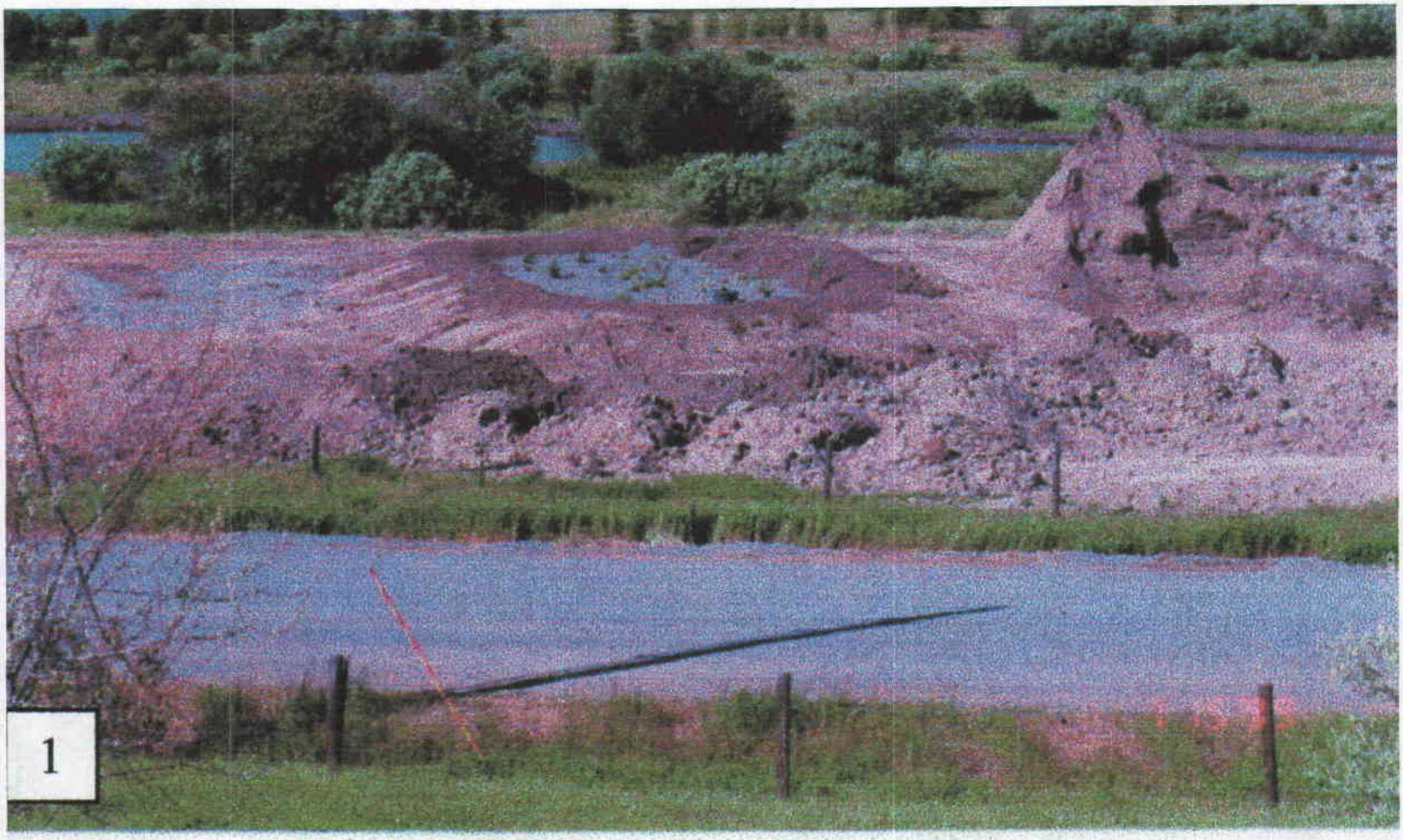
6. The bottom of the wetland cell was completely covered with the clay liner.

7. Infiltrator Units and the Level Control Structure are installed in the wetland cell. Septic Tank effluent will be dosed into the two (2) infiltrators at the front of the wetland. The round level control structure is placed inside the end of the wetland cell.

8. Medium sized crushed and washed gravel is uniformly placed and leveled in the wetland cell to a depth of 2 ½ feet. Four (4) inch layer of screened and washed (¼") pea gravel is spread and leveled on top of the wetland cell. (Note: the 4" PVC riser and the level control structure in the wetland cell serves as sites for collecting water quality monitoring samples.

9. Installation of two 1000-gallon septic tanks and one 500-gallon pump pit. All components have risers to surface for ease of operation and maintenance. Septic Tank effluent is dosed from the pump pit into the WSTS.

10. Construction stages including planting the wetland cell are completed. The WSTS is fully operational at the site.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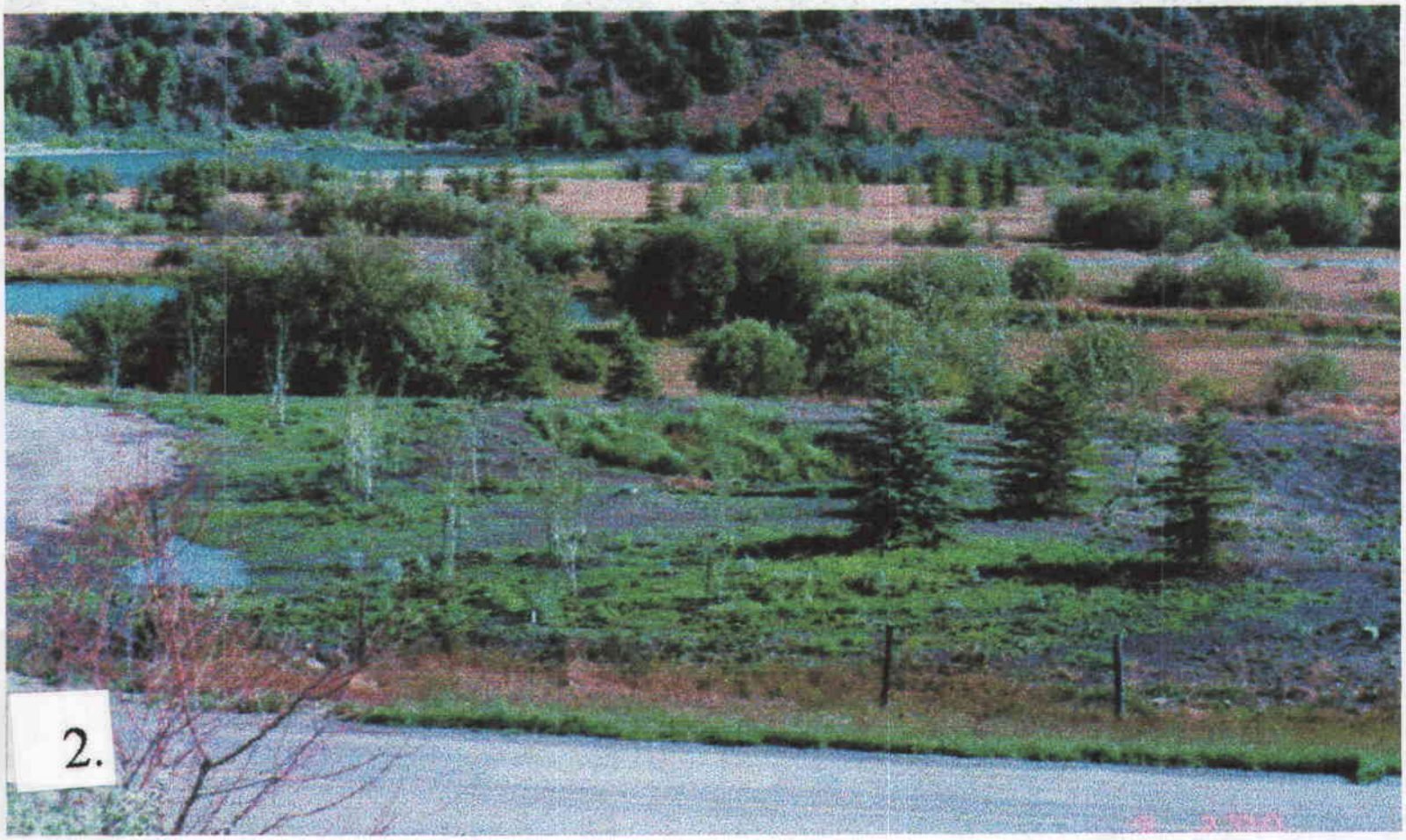
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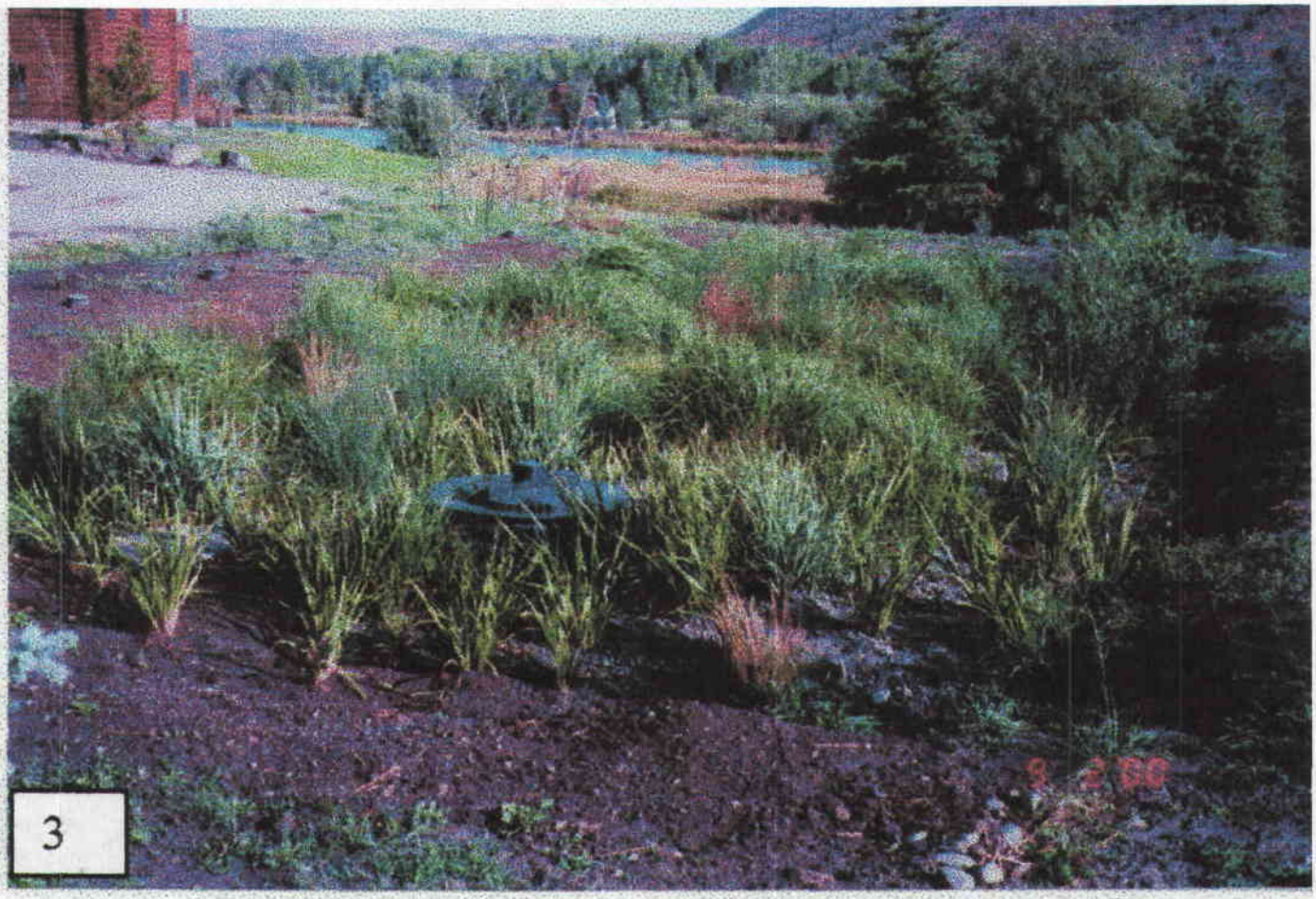

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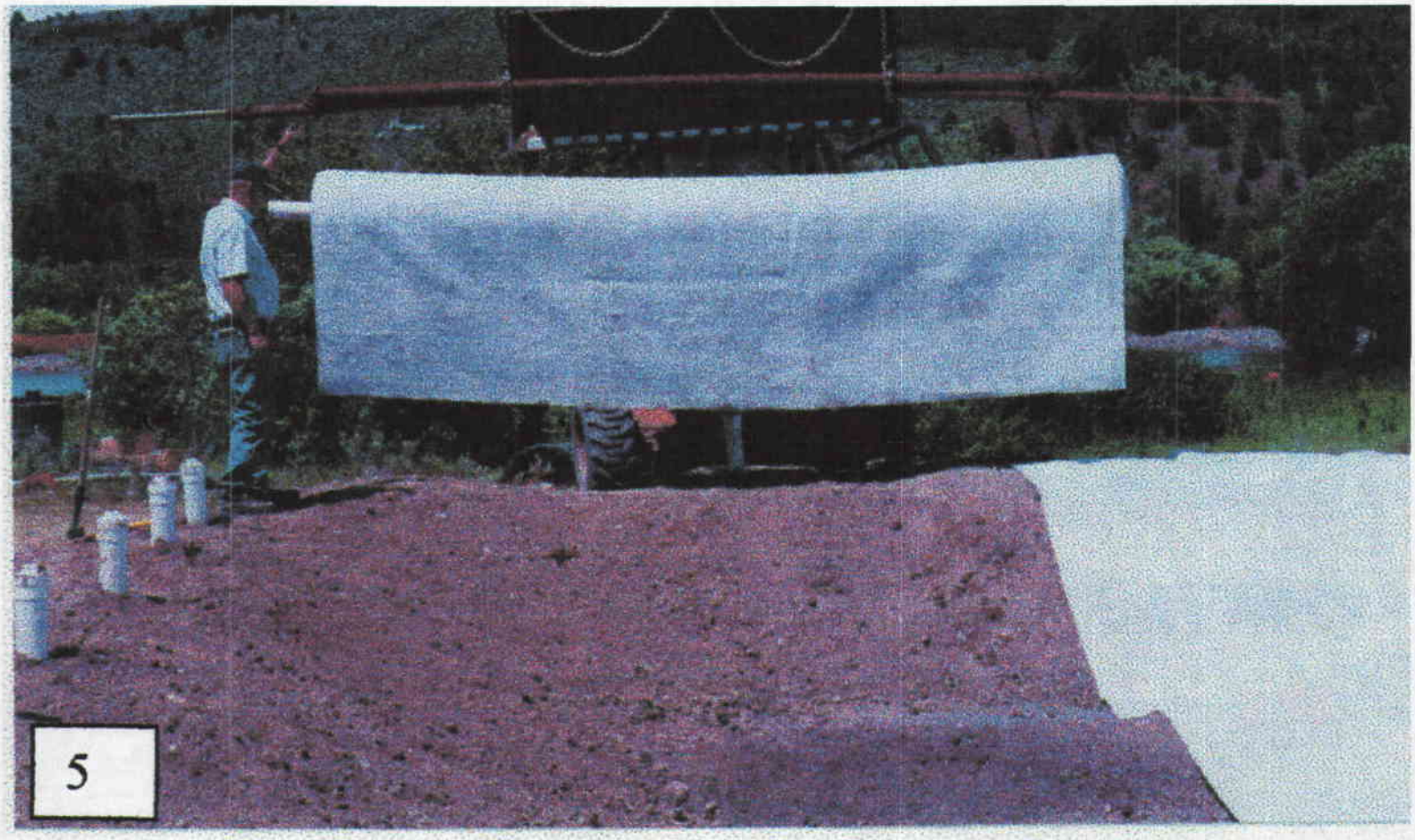

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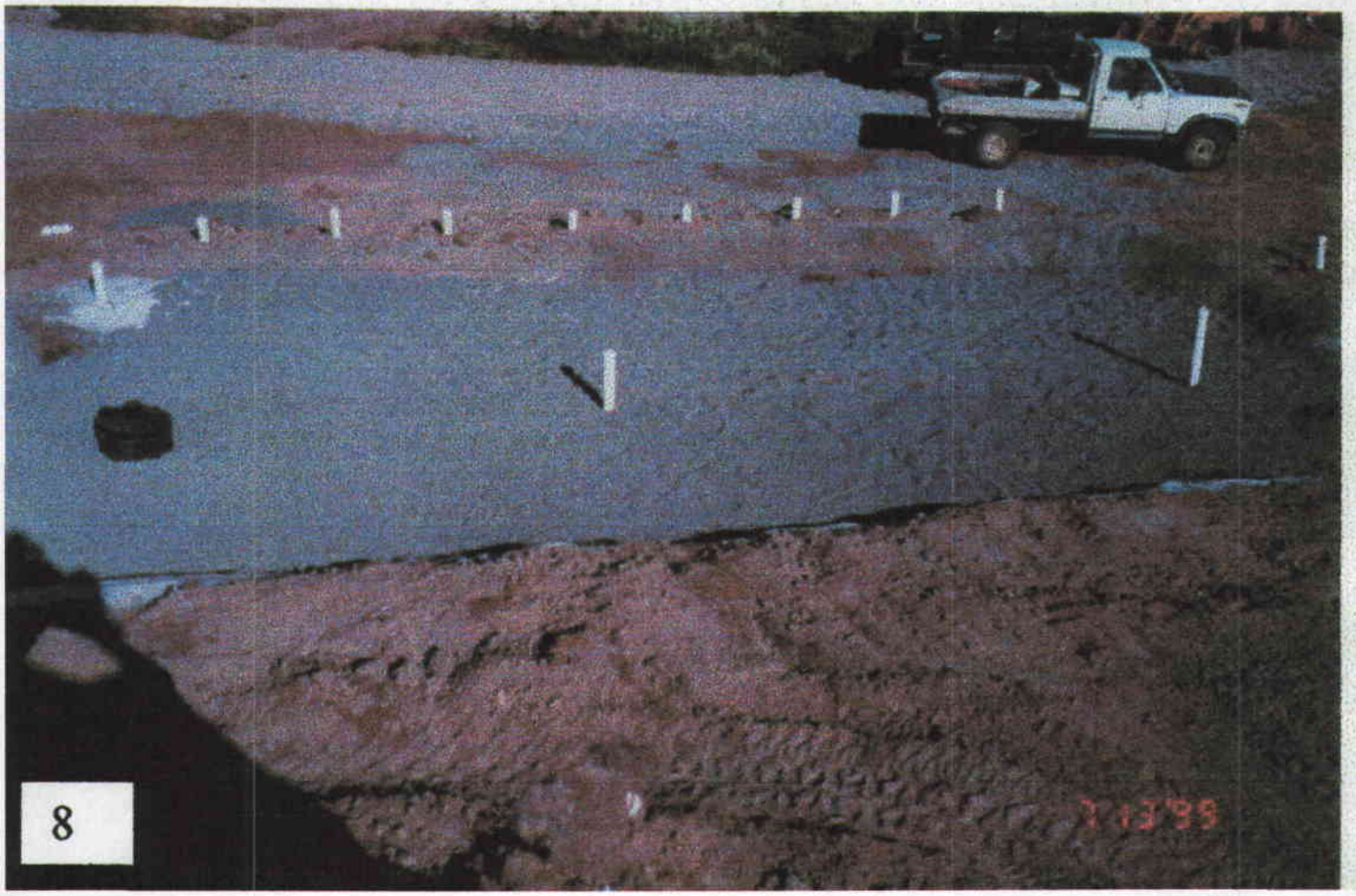
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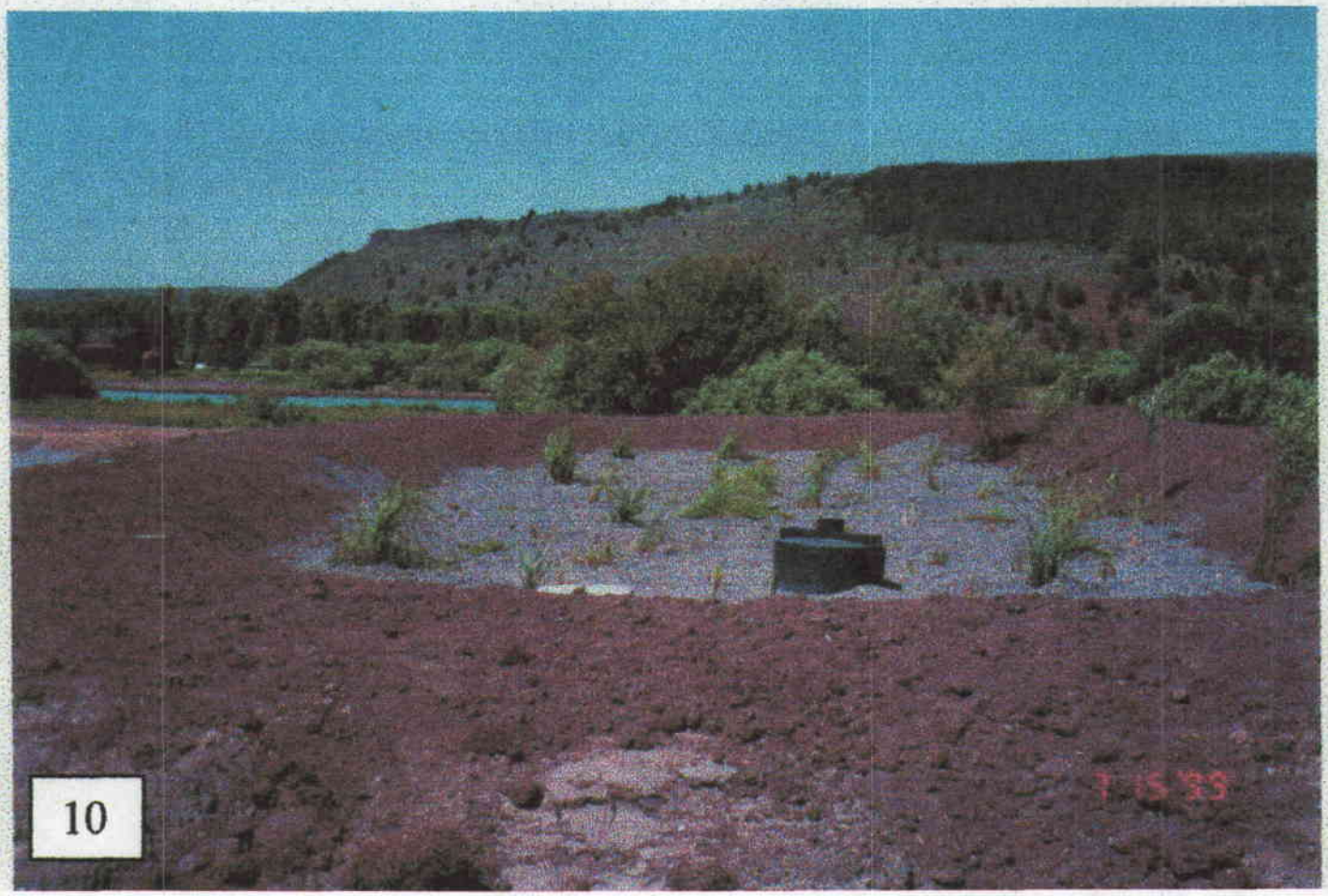
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