

**CORPS OF ENGINEER'S DREDGE AND FILL ACTIVITIES
AT LOS ALAMOS NATIONAL LABORATORY
JULY 24, 2000**

ACTION NO. 2000-00412:

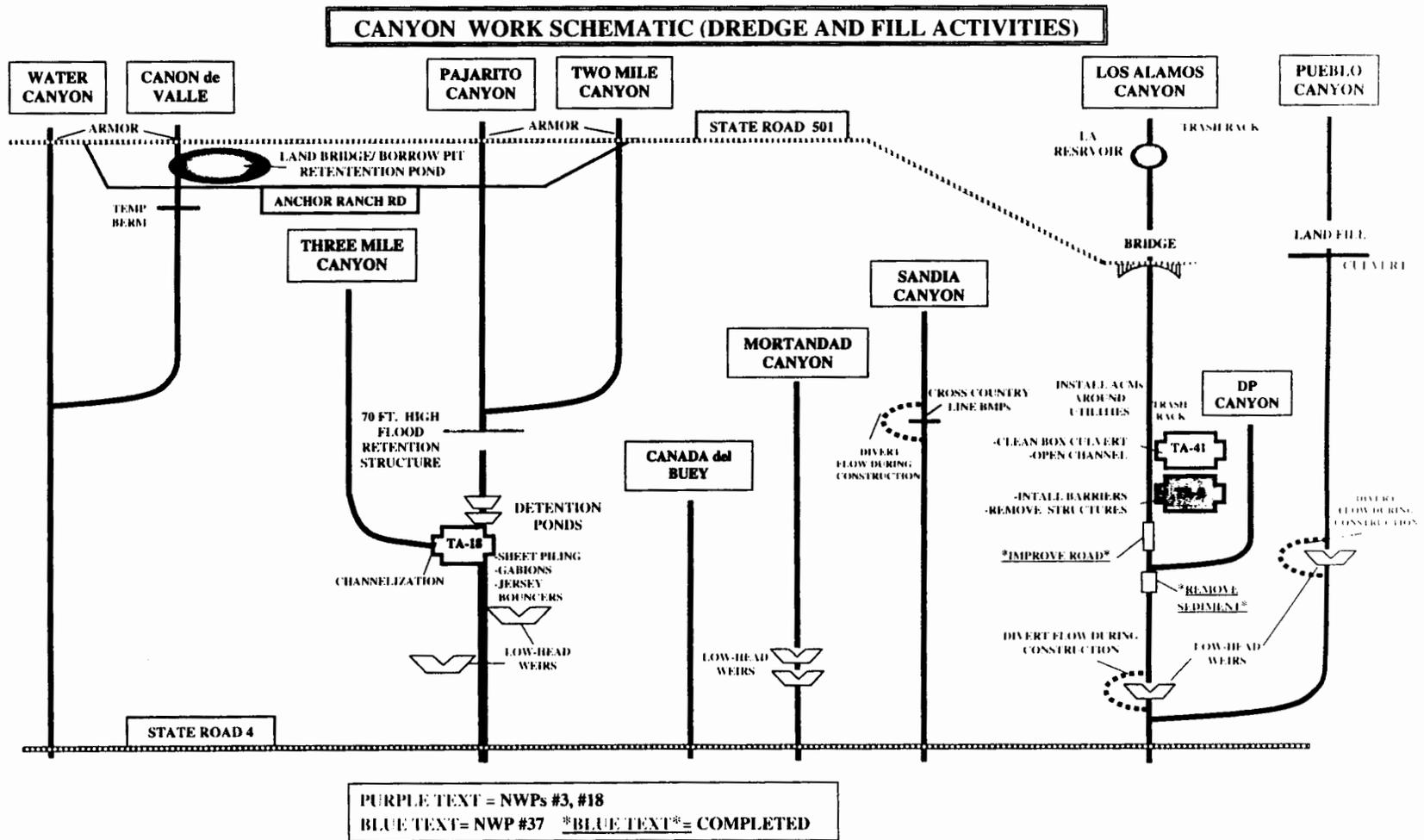
- (1) Los Alamos Reservoir mattress on dam, Nationwide Permit (NWP) 3, Water Quality Certification needed for work below OHWM of reservoir on lake side of dam. Perennial water, temporarily drained. Activity not on DOE property.
- (2) TA-41 box culvert, Los Alamos Canyon, no permit required for jersey barriers, NWP 3 for opening culvert if any fills in waters. Dry channel, use 6/7/00 Water Quality Certification. Activity on DOE Property.
- (3) TA-02 gabion tie-back and pilot channel, NWP 18. Dry channel, use 6/7/00 Water Quality Certification. Activity on DOE Property.
- (4) Two Mile Canyon, Hwy 501, mattress on embankment, clearing, CMP riser, NWP 3. Dry channel, use 6/7/00 Water Quality Certification. Activity on DOE Property.
- (5) Pajarito Canyon, Hwy 501, mattress on embankment, CMP riser, NWP 3. Dry channel, use 6/7/00 Water Quality Certification. Activity on DOE Property.
- (6) Channel on upland from Pajarito Canyon to Canon de Valle. No permit required, project on upland. If connection to two waterways involves minor amounts of fills, NWP 18. Dry channels, use 6/7/00 Water Quality Certification. Activity on DOE Property.
- (7) Anchor Ranch Rd "land bridge" armoring, NWP 3 if in waters of U.S. Dry channel, use 6/7/00 Water Quality Certification. Activity on DOE Property.
- (8) Anchor Ranch Rd culvert riser, trash rack, mattress embankment. Structures=no permit required. If fills in waters, NWP 18. Dry channel, use 6/7/00 Water Quality Certification. Activity on DOE Property.
- (9) TA-18, sheet pile wall with backfill. Not in waters of U.S., no permit required. Activity on DOE property.
- (10) Los Alamos Canyon sediment basin. Off channel. Possible minor fills to connect waterway to off channel, NWP 18. Dry channel, use 6/7/00 Water Quality Certification. Activity on DOE Property.
- (11) Pueblo Canyon sediment basin. Off channel. Possible minor fills to connect waterway to off channel, NWP 18. Dry channel, use 6/7/00 Water Quality Certification. Activity not on DOE Property.

ADDITIONAL COE ACTIVITIES:

- (1) Installation of low-head weir in Los Alamos Canyon.
- (2) Installation of low-head weir in Pueblo Canyon.
- (3) Installation of low-head weir(s) in Mortandad Canyon.
- (4) Construction of Pajarito Flood Retention Structure.



DRAFT



UPDATE OF DREDGE AND FILL ACTIVITIES IN CANYONS AT LOS ALAMOS NATIONAL LABORATORY

July 24, 2000

Pueblo Canyon:

1. Installation of low-head weir in Pueblo Canyon. Maximum dimensions of excavation 500 feet (L) x 400 feet (W) x 60 feet (D). **Project may include dewatering activities and/or divert flow around project area during construction. Reviewing alternative designs to increase weir structure, reduce excavation, and use of excavation material as fill in low-lying areas. Both options are under review.**
2. Construction of sediment basin in Pueblo Canyon.
3. Landfill culvert improvement.

Los Alamos Canyon:

1. Re-grade existing road that has been washed out in Los Alamos Canyon. Installation of gabions and washed rock for erosion control. Laboratory did not use material from TA-8 borrow pit.
2. Use diversion structures (jersey barriers, large shielding blocks, **and gabions**) to protect sanitary lift station below TA-41, production well sites, and TA-2/41.
3. Install gate at entrance of the TA-2/41 access road to keep unauthorized personnel out in case of flood potential.
4. TA-2 D&D cooling tower and surrounding structures (shed, UST, storage building, guard station). Waste transported to TA-54 for treatment and disposal.
5. Build new road between the TA-41 east fence and the TA-41-56 lift station.
6. Core drilling and armoring of the existing embankment for Los Alamos Reservoir. Installation of articulated mat (ARC) over the upstream face top and downstream embankment of the dam. Build access road downstream of the dam.
7. Remove approximately 700 cubic meters of contaminated soil from Los Alamos Canyon. Soil transported and disposed of at TA-54, Area G.
8. Installation of low-head weir in Los Alamos Canyon. Maximum dimensions of excavation 400 feet (L) x 100 feet (W) x 60 feet (D). **Project may include dewatering activities and/or divert flow around project area during construction.**
9. TA-2 gabion tie-back and pilot channel.
10. Los Alamos Canyon sediment basin. Off channel.
11. Remove silt from 8' x 15' concrete box culvert at TA-41.
12. Construct diversion structures and install BMPs to prevent erosion of material around the RLW cross-country line. No work planned at this time.
13. Re-channelization of Los Alamos Canyon around TA-2/41 to protect buildings.
14. **Erosion control in Los Alamos Canyon. Install a system of articulated concrete mats to protect the existing utilities (gas and electrical) that are located in the canyon floor.**
15. **Installation of trash rack below Los Alamos Reservoir. The project will consist of the driving 6 to 9 H beams into the ground, which will be at a depth of 30 feet.**

16. **Installation of trash rack at TA-41. The excavation will consist of the installation of a trash rack (debris collector) 560 to 600 feet west of building 30.**
17. **Drill and shot use of explosives in Los Alamos Canyon. Several holes will be drilled through rock using high explosives (type of explosives is TBD) to blow up rock obstruction.**
18. **Wellhead protection at wells R-9i and R-9. The scope for this phase of the on-going well installation project will include site restoration including grading, contouring, seeding, mulching, and application; well head completion and protection including concrete pad and protective vault installation; and security fence. The concrete vault will be placed over the well heads for protection from flood damage. Gabion baskets will be installed on the upstream side of the well heads to dissipate and deflect flood waters. Basecourse will be installed on the drill pads around the well heads and on the access road for all weather access.**
19. **Utility hardening of the existing 12" gas line at TA-53, and TA-73. The hardening will involve excavating both sides of the line 3 to 4 feet and installing gabions to protect the line from flood/erosion damage.**

Sandia Canyon:

1. Construct diversion structures and install BMPs to prevent erosion of material around the RLW cross-country line. Install gabions, re-establish water flow lines and re-vegetate with seed and shrubs.
2. Repair the TA-60 access road into Sandia Canyon.
3. **Well head protection at well R-12. Installation of a concrete pad at the well head (10' x 5' x 1' thick), installation of a concrete protective vault on the well head in conjunction with the concrete pad, installation of a security fence.**
4. **Utility hardening of the existing power line at TA-41, TA-43 and TA-61. The hardening will involve excavating both sides of the line 3 to 4 feet and installing gabions to protect the line from flood/erosion damage.**

Mortandad Canyon:

1. Fire rehab in upper Mortandad Canyon. Install check dams and wattles in shallow trenches. Build diversion berms along mesa edge.
2. TA-5 Rehabilitation. Clean culvert, install check dams and erosion control matting. Run-on diversion and flow dissipation within all drainages.
3. Repair the TA-60 access road into Mortandad Canyon.
4. Excavation of sediments (100-300 cubic yards) from Mortandad Canyon sediment traps. Transport the low-level sediments to TA-54 Area G. Includes construction of three new sediment ponds.
5. Installation of low-head weir(s) in lower Mortandad Canyon.

Canada Del Buey:

1. Runoff mitigation in upper Canada Del Buey. Placement of check dams. Installation of BMPs and protection of SWMUs. Berming of roadway for outfall drainage control.

2. Environmental remediation in upper Canada Del Buey. Tree falling, erosion dam construction and BMP implementation.
3. Fire rehab in Canada Del Buey northeast of TA-46. Place check dams and wattles in shallow trenches. Bulldozer used to re-contour storm drain outfall and for berm construction along dirt road.

Two Mile Canyon:

1. Two Mile Canyon rehabilitation. Clean culverts, place check dams and wattles in shallow trenches, log erosion barriers, hazard tree mitigation.
2. Two Mile Canyon/Anchor Ranch Road test pit. Excavate a test pit (6'x2'x8') immediately above the inlet structure for the landfill to characterize the foundation material.
3. Construction at Two Mile Canyon/Anchor Ranch Road. Tree removal, moving large rock at the upstream toe, dressing up slopes, installing articulated concrete mat.
4. Erosion improvements at Highway 501 and Two Mile Canyon. Removal of 4" ACM and geomat as required. Tree removal, clearing and grubbing of highway embankment slopes. Regrading of highway embankment slopes. Excavation of toe trenches at both embankment toes. Installation of soil nails. Installation of shotcrete or rock mattresses.

Pajarito Canyon:

1. Fire rehab on north rim of Pajarito Canyon. Check dams and wattles placement in shallow trenches.
2. Coring on 501 Land Bridge at Pajarito Canyon.
3. Core drilling in Pajarito Canyon approximately 1.8 miles above TA-18.
4. BMP Installation at TA-6, TA-22 and TA-40. Clean culverts and install check dams using native rock.
5. Hand auguring at TA-36 in Pajarito Canyon. Estimated 25 holes at a depth of 2 to 5 feet. Activity being done for proposed installation of detention basins within canyon.
6. Installation of concrete blocks and gabions or concrete blocks by bridge for flood control at TA-18.
7. Grade haul road up Pajarito Canyon.
8. Install 24" corrugated metal pipe vertically in stream as a stilling well to record flow.
9. Coring on 501 land bridge at Pajarito Canyon.
10. Straightening and widening existing stream bed located south of Kiva #1 at TA-18.
11. Harden the Pajarito drain and power pole adjacent to TA-18 water well.
12. Core drilling in Pajarito Canyon.
13. Construct TA-66 access road (25 foot wide) to staging area used for the Pajarito dam.
14. Construct a **flow retention structure (50 feet high x 200 feet long)** in Pajarito Canyon.
15. TA-18 harden utilities. Installation of jersey barriers and riprap around the power poles and guy wires.
16. Culvert cleaning at West Jemez Road and Pajarito Canyon. Construct access road and clean up the drainage, approximately 200 feet to the west and east.
17. TA-18 widen streambed in Pajarito Canyon (Phase II). Construct dip in the roadway to re-direct water.

18. Harden Highway 501 at Pajarito Canyon. Removal of 4" ACM and geomat as required. Tree removal, clearing and grubbing of highway embankment slopes. Regrading of highway embankment slopes. Excavation of toe trenched at both embankment toes. Installation of soil nails. Installation of shotcrete or rock mattresses. Extend the existing 48" CMP approximately 50 feet. Importing approximately 200 cubic yards of fill material for compacting outside embankments.
19. Harden Anchor Ranch Road at Pajarito Canyon. Removal of 4" ACM and geomat as required. Tree removal, clearing and grubbing of highway embankment slopes. Regrading of highway embankment slopes. Excavation of toe trenched at both embankment toes. Installation of soil nails. Installation of shotcrete or rock mattresses.
20. Channel on upland from Pajarito Canyon to Canon de Valle.
21. TA-18 sheet pile wall with backfill.
22. Construct detention ponds and install CMPs at TA-18.
23. Construct two 300 foot wide detention basins.
24. Construct check dam across upper Pajarito Canyon.
25. Pajarito wetlands upgrade.
26. **Erosion improvements at Highway 501 in Pajarito Canyon (Phase II). Excavate 2000 yards of fill from the barrow pit located in TA-16 to TA-08. The excavated soil will be used to dress fill the proposed work at 501 Pajarito Canyon (TA-8). This project includes the staging of the soil on 501 Pajarito Canyon, which will be located next to the work site.**
27. **Repair broken 480V secondary power line. The scope of work will consist of the installation of two manholes, junction boxes, and replacement of 90 feet of secondary electrical line.**

Three Mile Canyon:

1. Dig diversion trench in watercourse adjacent to Kiva 2 in Three Mile Canyon just above confluence with Pajarito Canyon.

Canon De Valle:

1. MDA-R emergency erosion control. Diversion of runoff and temporary dam construction.
2. MDA-R fire suppression activities. Excavate buried material at MDA-R to expose and suppress fire.
3. Construct access road into canyon on the west side of anchor ranch to clear out culvert drainage.
4. Construct detention pond at borrow pit where Canon de Valle crosses Highway 501.
5. Culvert cleaning at West Jemez Road and Canon De Valle. Construct access road and clean up the drainage, approximately 200 feet to the west and east.
6. Armoring at Highway 501. Removal of 4" ACM and geomat as required. Tree removal, clearing and grubbing of highway embankment slopes. Regrading of highway embankment slopes. Excavation of toe trenched at both embankment toes. Installation of soil nails. Installation of shotcrete or rock mattresses.

Water Canyon:

1. Replace fire damaged erosion control BMPs at TA-49. Installation of riprap BMPs in two drainages near MDA-AB.
2. Culvert cleaning at West Jemez Road and Water Canyon. Construct access road and clean up the drainage, approximately 200 feet to the west and east.
3. Emergency embankment hardening at Highway 501 and Water Canyon. Removal of 4" ACM and geomat as required. Tree removal, clearing and grubbing of highway embankment slopes. Regrading of highway embankment slopes. Excavation of toe trenched at both embankment toes. Installation of soil nails. Installation of shotcrete or rock mattresses.

Misc. Activities In Canyons:

1. Culvert maintenance labwide. Installation, replacement, and cleaning of culverts.
2. Re-placement of burnt power poles.
3. Re-placement of burnt fence posts.
4. Fire roads and fire breaks were constructed to help extinguish and control the Cerro Grande Wildfire. Road cutting/grading to improve access for rehabilitation activities and evacuation purposes.
5. Place rock and log check dams in drainages to slow flow/drop sediment. Construct additional detention ponds, retention ponds, and earthen dams as identified.
6. Contour raking, mulching and re-seeding/aerial seeding for erosion control.
7. Remove miscellaneous debris, fallen trees from centerline area of drainage, dredge silt after storm events.
8. Evaluate, upgrade, repair and install BMPs at Solid Waste Management Units (SWMUs) and Potential Release Sites (PRSs).
9. Perform soil sampling and characterization to monitor sediment transport.

**DREDGE AND FILL ACTIVITIES
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July 24, 2000**

Armoring of Roads:

1. Construction located at land bridge at Twomile Canyon and Anchor Ranch Road (ephemeral reach). From 50' before upstream toe, up the upstream face, over the road, down the downstream face, and 50' below the toe. Tree removal, moving large rock at the upstream toe, dressing up slopes, installing articulated concrete mat. See map 00X-0414.
2. Erosion improvements at Highway 501 and Twomile Canyon (ephemeral reach). Removal of 4" ACM and geomat as required. Tree removal, clearing and grubbing of highway embankment slopes. Regrading of highway embankment slopes. Excavation of toe trenches at both embankment toes. Installation of soil nails. Installation of shotcrete or rock mattresses. See map 00X-0446.
3. Harden Highway 501 at Pajarito Canyon (ephemeral reach). Removal of 4" ACM and geomat as required. Tree removal, clearing and grubbing of highway embankment slopes. Regrading of highway embankment slopes. Excavation of toe trenches at both embankment toes. Installation of soil nails. Installation of shotcrete or rock mattresses. Extend the existing 48" CMP approximately 50 feet. Importing approximately 200 cubic yards of fill material for compacting outside embankments. See map 00X-0447.
4. Harden Anchor Ranch Road at Pajarito Canyon (ephemeral reach). Removal of 4" ACM and geomat as required. Tree removal, clearing and grubbing of highway embankment slopes. Regrading of highway embankment slopes. Excavation of toe trenches at both embankment toes. Installation of soil nails. Installation of shotcrete or rock mattresses. See map 00X-0450.
5. Armoring at Highway 501 at Canon de Valle (ephemeral reach). Removal of 4" ACM and geomat as required. Tree removal, clearing and grubbing of highway embankment slopes. Regrading of highway embankment slopes. Excavation of toe trenches at both embankment toes. Installation of soil nails. Installation of shotcrete or rock mattresses. See map 00X-0448.
6. Emergency embankment hardening at Highway 501 and Water Canyon (perennial reach). Removal of 4" ACM and geomat as required. Tree removal, clearing and grubbing of highway embankment slopes. Regrading of highway embankment slopes. Excavation of toe trenches at both embankment toes. Installation of soil nails. Installation of shotcrete or rock mattresses. See map 00X-0449.

Armoring of Dam:

1. Installation of articulated mat (ARC) over the upstream face top and downstream embankment of the dam. Core drilling and armoring of the existing embankment for Los Alamos Reservoir. Perennial water upstream of dam. Dam temporarily drained. See map 00X-0391.

Hardening\Repair Utilities:

1. Construct diversion structures and install BMPs to prevent erosion of material around the RLW cross-country line in Los Alamos Canyon (ephemeral reach). No work planned at this time. Work would be similar to work in Sandia Canyon.
2. Erosion control in Los Alamos Canyon. Install a system of articulated concrete mats to protect the existing utilities (gas and electrical) that are located in the ephemeral portions of canyon floor. Maximum dimensions of excavation 400' (L) x 10' (W) x 3' (D). See map 00X-0462.
3. Utility hardening of the existing 12" gas line at TA-53, and TA-73. The hardening will involve excavating both sides of the line 3 to 4 feet and installing gabions to protect the line from flood/erosion damage. The line will be hardened for approximately 1/4 mile. Excavation may impact ephemeral portions of Los Alamos Canyon. See map 00X-0505.
4. Utility hardening of the existing power line at TA-41, TA-43 and TA-61. The hardening will involve excavating both sides of the line 3 to 4 feet and installing gabions to protect the line from flood/erosion damage. Maximum dimension of trenching is 80' (L) x 4' (W) x 4' (D). Excavation may impact Sandia Canyon. Sandia Canyon is effluent dominant from the TA-46 Sanitary Wastewater System (SWS) (NPDES Outfall 13S) and TA-3 Power Plant (NPDES Outfall 001) discharges. See map 00X-0504.
5. Construct diversion structures and install BMPs to prevent erosion of material around the radioactive liquid wastewater (RLW) cross-country line (approximately 300') in Sandia Canyon. Install gabions, re-establish water flow lines and re-vegetate with seed and shrubs. Sandia Canyon is effluent dominant from the TA-46 SWS (NPDES Outfall 13S) and TA-3 Power Plant (NPDES Outfall 001) discharges. See map 00X-0452.
6. Harden the Pajarito drain and power pole adjacent to TA-18 water well with gabions. Located at turn off to TA-18 from Pajarito road. The channel needs to be hardened to protect Pajarito Well #2. Impacted area 120' (L) x 6' (W) x 3' (D). Pajarito is ephemeral in area impacted by construction. See map 00X-0416.
7. TA-18 harden utilities. Installation of jersey barriers and riprap around the power poles and guy wires. The power line is located below TA-18 in Pajarito Canyon, it comes off the TA-54 mesa into the canyon that runs in an easterly direction to White Rock. Grade area to level and excavate 1' to place barriers. There will be riprap (rock) placed at assemblies. Place riprap in channel. Excavate 1' down and 2' into the bank for approximately 200'. Located in wetlands area. See map 00X-00435.
8. Repair broken 480V secondary power line that supports TA-18 Kiva 2 in Pajarito Canyon (ephemeral). The excavation will take place approximately 150' east of the bridge/box culvert located southwest of Building 30. The scope of work will consist of the installation of two manholes, junction boxes, and replacement of 90 feet of secondary electrical line. The maximum trenching dimensions are 90' (L) x 2' (W) x 3' (D). See map 00X-0513.
9. Wellhead protection at wells R-9i and R-9. The scope for this phase of the on-going well installation project will include site restoration including grading, contouring, seeding, mulching, and application; well head completion and protection including

concrete pad and protective vault installation; and security fence. The concrete vault will be placed over the well heads for protection from flood damage. Gabion baskets will be installed on the upstream side of the well heads to dissipate and deflect flood waters. Basecourse will be installed on the drill pads around the well heads and on the access road for all weather access. Excavation dimensions are 10' (L) x 6' (W) x 2' (D). Wells are located in ephemeral watercourse. See map 00X-0493.

10. Well head protection at well R-12 in Sandia Canyon. Installation of a concrete pad at the well head (10' x 5' x 1' thick), installation of a concrete protective vault on the well head in conjunction with the concrete pad, installation of a security fence. Sandia Canyon is an effluent dominant watercourse from the TA-46 SWS Plant (NPDES Outfall 13S) and TA-3 Power Plant (NPDES Outfall 001) discharges. Wastewater infiltrates into the ground prior to leaving DOE property. Project is not located in path of normal wastewater flow. See map 00X-0494.
11. Re-placement of power poles/lighting poles out of the flood areas in TA-18 near Building 30 in Pajarito Canyon (ephemeral reach). Excavation(s) 24" (L) x 24" (W) x 7' (D). See map 00X-0460.
12. Re-placement of burnt fence posts caused by flooding in south fork of Pajarito Canyon (Starmers Gulch) just north of perimeter fence around TA-8, Building 30. Starmers Gulch is a short perennial reach of Pajarito Canyon. Also replace fence posts in tributary to Canon de Valle (ephemeral reach) south of the perimeter fence behind TA-16, Building 210. See maps 00X-0453 and 0454.

Installation of trash racks and box culverts:

1. Installation of trash rack below Los Alamos Reservoir in Los Alamos Canyon. The project will consist of the driving 6 to 9 H beams into the ground, which will be at a depth of 30 feet. Excavation dimensions are 1' (L) x 1' (W) x 30' (D). There is intermittent flow from dam during normal operations. However, dam being drained for armoring purposes. See map 00X-0472.
2. Installation of trash rack at TA-41. The excavation will consist of the installation of a trash rack (debris collector) 560 to 600 feet west of building 30. Maximum dimensions are 40' (L) x 40' (W) x 0' (D). Project located in ephemeral portion of Los Alamos Canyon. See map 00X-0473.

Low Head Weirs, Detention Ponds, and Flood Retention Structures:

1. Installation of low-head weir in Pueblo Canyon. Maximum dimensions of excavation 500' (L) x 400' (W) x 60' (D). Located in wetlands. Excavated material may be placed in low-lying area immediately upstream of weir (600' x 500'). Project may include dewatering activities and divert flow around project area during construction. Reviewing alternative designs to increase weir height to reduce excavation upstream, and reduce the use of excavation material as fill in low-lying areas. Both options are currently under review. Wetland delineation completed. See map 00X-0444.
2. Installation of low-head weir in Los Alamos Canyon. Maximum dimensions of excavation 400' (L) x 100' (W) x 60' (D). Project may include dewatering activities

and divert flow around project area during construction. Project location in ephemeral reach of Los Alamos Canyon. See map 00X-0442.

3. Installation of low-head weir(s) in lower Mortandad Canyon. No designs available at this time. Similar to low-head weirs in Los Alamos and Pueblo Canyons. Project located in an ephemeral reach of Mortandad Canyon.
4. MDA-R emergency erosion control in Canon de Valle (ephemeral reach). Diversion of runoff and temporary retention structure (300' (L) x 5' (W) x 5' (D)). Retention structure to be removed upon project completion. See map 00X-0317.
5. Pajarito flood retention structure. Designs (75% completion) provided to COE and NMED on July 18, 2000 (ESH-18/WQ&H:00-0237). See map 00X-0434.
6. Construction of sediment basins in Pueblo and Los Alamos Canyons. No designs available at this time. May be replaced by low-head weirs.
7. Construct detention pond at borrow pit where Canon de Valle crosses Highway 501. No designs available at this time.

Channelization:

1. Re-channelization of Los Alamos Canyon (ephemeral) around TA-2/41 to protect buildings.
2. Straightening and widening existing streambed located south of Kiva #1 at TA-18 in Pajarito Canyon (ephemeral). Area impacted is 1200' (L) x 15' (W) x 0' (D). See map 00X-0403.
3. TA-18 widen streambed in Pajarito Canyon (Phase II). Construct dip in the roadway to re-direct water. Work will consist of working on the south side of culvert on the access road in TA-18 that leads to Kivas 2 and 3. Impacted area 100' (L) x 30' (W) x 0' (D). Pajarito Canyon is ephemeral in this portion of canyon. See map 00X-0445.

Installation of Protection Barriers:

1. Use diversion structures (jersey barriers, large shielding blocks, and gabions) to protect sanitary lift station below TA-41, production well sites, and TA-2/41 facilities. Install approximately 22 large shielding blocks (36" (H) x 72" (W) x 120" (L)) in Los Alamos Canyon to divert runoff away from facilities. Excavate material upstream of the reactor building (approximately 15 yd³) and stockpile inside the fenced area. Located in the ephemeral reach of Los Alamos Canyon. See map 00X-0328.
2. Installation of concrete blocks and gabions or concrete blocks by bridge for flood control at TA-18, Building 30. This will require leveling of the streambed to provide a stable footing for the blocks or gabions. Area impacted is approximately 25' (L) x 10' (W) x 2' (D). See map 00X-0376.

Erosion Control/Fire Rehab:

1. Fire rehab in upper Mortandad Canyon (ephemeral reach). Install check dams and wattles in shallow trenches. Build diversion berms along mesa edge. All check dams and wattles will be placed in shallow trenches 3"-6" (D) x 9" (W) x length

- unknown. Soil scrapping for berm construction will be no deeper than 1' by 8' wide. Longest run for berm is approximately 75'. See map 00X-0343.
2. TA-5 fire rehabilitation. Clean culvert, install check dams and erosion control matting. Run-on diversion and flow dissipation within all drainages of Mortandad Canyon (ephemeral reach). See map 00X-0389.
 3. Fire rehab in Canada Del Buey northeast of TA-46. Runoff mitigation in upper Canada Del Buey. Bulldozer used to re-contour storm drain outfall and for berm construction along dirt road. Placement of check dams. Installation of BMPs and protection of SWMUs. Berming of roadway for outfall drainage control. Canada Del Buey is an ephemeral watercourse. See map 00X-0344.
 4. Environmental remediation in upper Canada Del Buey. Tree falling, erosion dam construction and BMP implementation. Impacted area 2500' (L) x 1250' (W) x 9" (D). Area is not in watercourse. See map 00X-0331.
 5. Twomile Canyon rehabilitation (ephemeral reach). Clean culverts, place check dams and wattles in shallow trenches, log erosion barriers, hazard tree mitigation. Build diversion berms along mesa edge. All check dams and wattles will be placed in shallow trenches 3"-6" (D) x 9" (W) x length unknown. Soil scrapping for berm construction will be no deeper than 1' by 8' wide. Longest run for berm is approximately 75'. See map 00X-0357.
 6. Fire rehab on north rim of Pajarito Canyon (ephemeral). Check dams and wattles placement in shallow trenches. Excavation not in watercourse. See map 00X-0341.
 7. BMP installations at TA-6, TA-22 and TA-40. Clean culverts and install check dams using native rock. Raking, re-seeding, and mulch are needed. Ephemeral portion of Pajarito Canyon. See map 00X-0367.
 8. Replace fire damaged erosion control BMPs at TA-49 near Water Canyon (ephemeral reach). Installation of riprap BMPs in two drainages near MDA-AB. Install log velocity dissipaters, add rip-rap, replace silt fences and replace straw bale BMPs upgradient and west of MDA-AB with synthetic sediment barriers (bury barriers 6"-8"). See map 00X-0332.

Road/Maintenance Activities:

1. Re-grade existing road that has been washed out in Los Alamos Canyon. Installation of gabions and washed rock for erosion control. Maximum dimensions 20,000' (L) x 15' (W) x 2' (D). Located in ephemeral reach of Los Alamos Canyon. Project completed. See map 00X-0328.
2. Build new road between the TA-41 east fence and the TA-41-56 lift station. Place fencing at the lift station and sand bag for flood protection. Excavation 250' (L) x 20' (W) x 1' (D). Located in the ephemeral reach of Los Alamos Canyon. See map 00X-0383.
3. Build access road downstream of the Los Alamos dam. Los Alamos dam is temporarily drained. The road will not exceed 500'. See map 00X-0391.
4. Repair the TA-60 access road into Sandia Canyon and Mortandad Canyon. Maximum dimension is 3200' (L) x 20' (W) x 1' (D). Road intersects only small portion of actual streambed in Sandia and Mortandad Canyons (10' (L) x 20' (W) x 1' (D)). Mortandad is ephemeral and Sandia is effluent dominated from the TA-46

SWS (NPDES Outfall 13S) and TA-3 Power Plant (NPDES Outfall 001) discharges. See map 00X-0389.

5. Grade haul road up Pajarito Canyon (ephemeral reach) from TA-18 and log out burnt or hazardous logs which could end up at TA-18 in the event of a severe flood. A trail will be bladed to accommodate logging trucks removing trees in canyon. Maximum dimensions 10,000' (L) x 16' (W) x 1' (D). See map 00X-0400.
6. Construct TA-66 access road (25 foot wide) to staging areas used for the Pajarito FRS. Two staging areas will be implemented. Staging area 1 consists of 300' x 300' staging area and access road. Staging area 2 consists of 200' x 300' staging area and a 25' access road. See map 00X-0433.
7. Culvert cleaning at West Jemez Road and Pajarito Canyon (ephemeral). Construct access road and clean up the drainage, approximately 200 feet to the west and east. Maximum excavation dimensions 1200' (L) x 40' (W) x 1' (D). See map 00X-0441.
8. Construct access road into Canon de Valle on the west side of anchor ranch to clear out culvert drainage. Maximum dimensions 300' (L) x 20' (W) x 1' (D). See map 00X-0356.
9. Culvert cleaning at West Jemez Road and Canon De Valle, Water, and Pajarito. Construct access road and clean up the drainage, approximately 200 feet to the west and east. Drainages from the Santa Fe National Forest is clogging up the culverts. All three reaches are ephemeral. See map 00X-0441.
10. Landfill culvert improvement at Diamond Drive in Pueblo Canyon.
 11. Install gate on existing paved road at entrance of the TA-2/41 access road in Los Alamos Canyon to keep unauthorized personnel out in case of flood potential. Excavation is approximately 2' (L) x 2' (W) x 4' (D). Located in the ephemeral reach of Los Alamos Canyon. See map 00X-0345.
12. Culvert maintenance lab-wide, as needed. Installation, replacement, and cleaning of culverts. See map 00X-0329.

Sediment Removal:

1. Remove approximately 700 cubic meters of contaminated soil from Los Alamos Canyon. Soil transported and disposed of at TA-54, Area G. Location in ephemeral portion of Los Alamos Canyon. See map 00X-0392.
2. Remove silt from an existing 8' x 15' concrete box culvert at TA-41. Project is located in ephemeral reach of Los Alamos Canyon.
3. Excavation of sediments (100-300 cubic yards) from Mortandad Canyon sediment traps. Transport the low-level sediments to TA-54 Area G. This project may also include construction of three new sediment ponds. Mortandad is ephemeral watercourse. Designs for new sediment ponds are not available at this time. See map 00X-0427.
4. Erosion improvements at Highway 501 in Pajarito Canyon (Phase II). Excavate 2000 yards of fill from the borrow pit located in TA-16 to TA-08. The excavated soil will be used to dress fill the proposed work at 501 Pajarito Canyon (TA-8). This project includes the staging of the soil on 501 Pajarito Canyon (ephemeral reach), which will be located next to the work site. See map 00X-0491.

5. MDA-R fire suppression activities in Canon de Valle. Excavate buried material at MDA-R to expose and suppress fire. Excavation not in watercourse (side of canyon). Area excavated 250' (L) x 15' (W) x 15' (D). Material placed back in hole. See map 00X-0320.

Sampling/Test pits:

1. Coring on 501 Land Bridge at Pajarito Canyon. Obtaining core samples for geotechnical sampling of landbridge material (50' deep). Not in watercourse. See map 00X-0402.
2. Core drilling in Pajarito Canyon approximately 1.8 miles above TA-18. Five core drill samples will be obtained up to 30 feet deep. The center core will be in the Pajarito stream bottom and the remaining cores will be approximately 50' apart in both directions perpendicular to the canyon bottom. See map 00X-0416.
3. Twomile Canyon/Anchor Ranch Road test pit. Excavate a test pit (6'x2'x8') immediately above the inlet structure for the landfill to characterize the foundation material. Located in ephemeral reach of Twomile Canyon. See map 00X-0393.
4. Hand auguring at TA-36 in Pajarito Canyon. Estimated 25 holes at a depth of 2' to 5' (4" diameter). Activity being done for proposed installation of detention basins within canyon. See map 00X-0375.
5. Install 24" corrugated metal pipe vertically in stream as a stilling well to record flow in Pajarito Canyon. Pipe will be in approximately 3 feet of concrete and topped with instrument shelter and automatic sampler. The installation will be serviceable by metal walkway back to high bank. Work will be performed 150' below highway 501 (ephemeral). See map 00X-0401.
6. Core drilling approximately 20' deep at two locations on Los Alamos Reservoir. Sample and lab analyses of the samples. See map 00X-0391.

Misc. Activities:

1. TA-2 D&D cooling tower and surrounding structures (shed, UST, storage building, guard station). Waste transported to TA-54 for treatment and disposal. Located in the ephemeral reach of Los Alamos Canyon. See map 00X-0374.
2. Drill and shot use of explosives in Los Alamos Canyon (ephemeral reach). Several holes will be drilled through rock using high explosives (type of explosives is TBD) to blow up rock obstruction. This project supports the installation of the low-head weir project. See map 00X-0490.