State of New Mexico
ENVIRONMENT DEPARTMENT
DOE OVERSIGHT BUREAU
P.O. Box 1663, MS/J-993
Los Alamos, New Mexico 87545

GARY JOHNSON
GOVERNOR

PETER MAGGIORE
SECRETARY

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JAN 2000

Carl Sykes, DOE/AIP/POC
Department of Energy
Los Alamos Area Office
MS: A316
Los Alamos, NM 87544

December 29, 1999

Subject: Observations and recommendations regarding BMP implementation and maintenance at TA-54, Area G & TWISP area

Dear Mr. Sykes:

On July 28, 1999, the New Mexico Environment Department, Department of Energy Oversight Bureau surveyed the TA-54, Area G & TWISP, Pad 4 area. The purpose of our visit was to evaluate new dome and road construction impacts on storm water drainage patterns and potential impacts to buried waste disposal areas. In addition, we evaluated Best Management Practices (BMPs) effectiveness and maintenance at the TWISP Pad 4 area. Recommendations were provided verbally to facility representatives during the site visit and at a close-out meeting.

Enclosed is a summary of our evaluations. Included are a site map, photo documentation, observations, recommendations, and data from one split sample of sediments captured by silt fencing below the TWISP Pad 4 area.

On August 4, 1999, we accompanied ESH-18 on their Annual TA-54 NPDES Compliance Inspection. Many of the recommendations we made on the July 28th visit had already been implemented. This has been noted in the attached summary where appropriate.

Sincerely,

Stephen Yanicak

Steve Yanicak,
Point of Contact/LANL,
NMED, DOE OB

SY:rfs
attachment
cc: with enclosures

John Parker, Chief, NMED, DOE OB
Jim Davis, Chief, NMED, SWQB
James Bearzi, Chief, NMED, HRMB
Steve Rae, LANL, ESH-18, MS K490
Steve Mee, F-SWO, MS J595
Tony Stanford, FWO-DO, MS P913

11456

HSWA LANL 5/1148/54

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Photo 1

Photo 1 was taken from southwest of new dome structure, Bld. 375, looking east across newly established grass cover and geo-textile fabric (overlain with cobble) apron covering disposal Pit 7.

The bare soil in foreground, down-gradient from Pit 7, is approximately one meter of crushed Bandelier Tuff covering Pit 24. This cover was recently re-graded to repair 2 foot deep gullies formed by runoff from the June 17 storm and to repair damaged silt fences. Note single silt fence below site on lower right.

Recommendations:

- Storm water runoff drainage patterns should be designed to divert as much water away from buried waste Pits 7 & 24 as possible to minimize erosion of soil covers and prevent infiltration of water into either Pit.

- Multiple silt fences (sequenced down-gradient) would provide additional protection and inhibit overloading of the furthest downstream BMP.

  Note: Multiple silt fences were installed by the August 4 inspection (Photo 15).

Photo 2 Looking west towards Building 375

Photo 2 is looking west at Building 375 and alternating grass, rock, and fiber erosion control blanket (brown slope) over Pit 7.

The cover-crop and perennial grass seed (far left) has germinated and is providing good protection of the slope from erosion. Grass seed on blanketed slope failed to germinate but slope is stable and showing no signs of erosion.

Asphalt pad underlying new dome structure (contiguous with staging area pad above rock-covered slope) is bermed on south end and storm water runoff is collected and discharged from pad area and some of the eastern portion of the dome structure through 2 groups of 2 pipes directly onto rock/geo-textile fabric over Pit 7 (black pipes in center of close-up of rock covered slope, Photo 3).

Excess runoff from discharge pipes would then flow over Pit 24 which is currently covered with approximately 1 m of crushed Bandelier Tuff with no vegetative cover.

Drainage from northwest area of facility (heavy equipment staging area and empty barrel storage on pad over Pits 8, 9 and 10 in background) is directed over Pit 24 (bare soil below stabilized slope) (See photos 4 & 5).

Recommendations:

- The revegetation effort (brown slope) is under warranty. Efforts to reseed should coincide with the rainy season to increase probability of success.

- The consequences of directing storm water onto a buried waste cell (Photos 3, 4 & 5) should be reevaluated. We suggest continuing discharge piping in Photo 3 over and beyond (south of) Pit 24.

Photo 3 Storm wa[illegible] drainage pipes directed onto S[illegible]U (Pit 7) cover

Photo 4 Drainage west of Building 375

Photo 5 Looking south towards corner of Pit 24

Photo 5 is a view of the same drainage (looking south) as shown in Photo 4. This drainage is located southwest of Building 375 between Building 375 and heavy equipment staging area. Runoff from the northwest portion of Building 375, road (near bus in background, Photo 4), and heavy equipment staging area is directed to this drainage and then over Pit 24. Stake with white placard, to the left of people, marks the northwest corner of Pit 24. Note drainage is eroding new soil and grass cover over Pit 7 and directs storm water towards the left (east) over Pit 24.

Recommendations:

- This drainage channel (photos 4 & 5) should be designed (widened, deepened, and slightly U shaped) so it can handle expected runoff volumes.
- The drainage should be directed southward, away from Pit 24, to natural drainage behind people in Photo 4 which has an old gage station where erosion has cut a bypass (Photo 6).
- This gage station, if the eroded bypass was repaired, could be utilized as a storm water runoff detention basin.
- Additional detention basins placed in this drainage would slow runoff from a large portion of the northeast portion of TA-54 and help protect the silt fences and sampling station (G3) down canyon at site boundary.

Photo 6 Looking south from rock apron over Pit 7 across drainage with weir (Photo 7)

Photo 7 People standing on platform are inspecting location where erosion has diverted flows around gage.

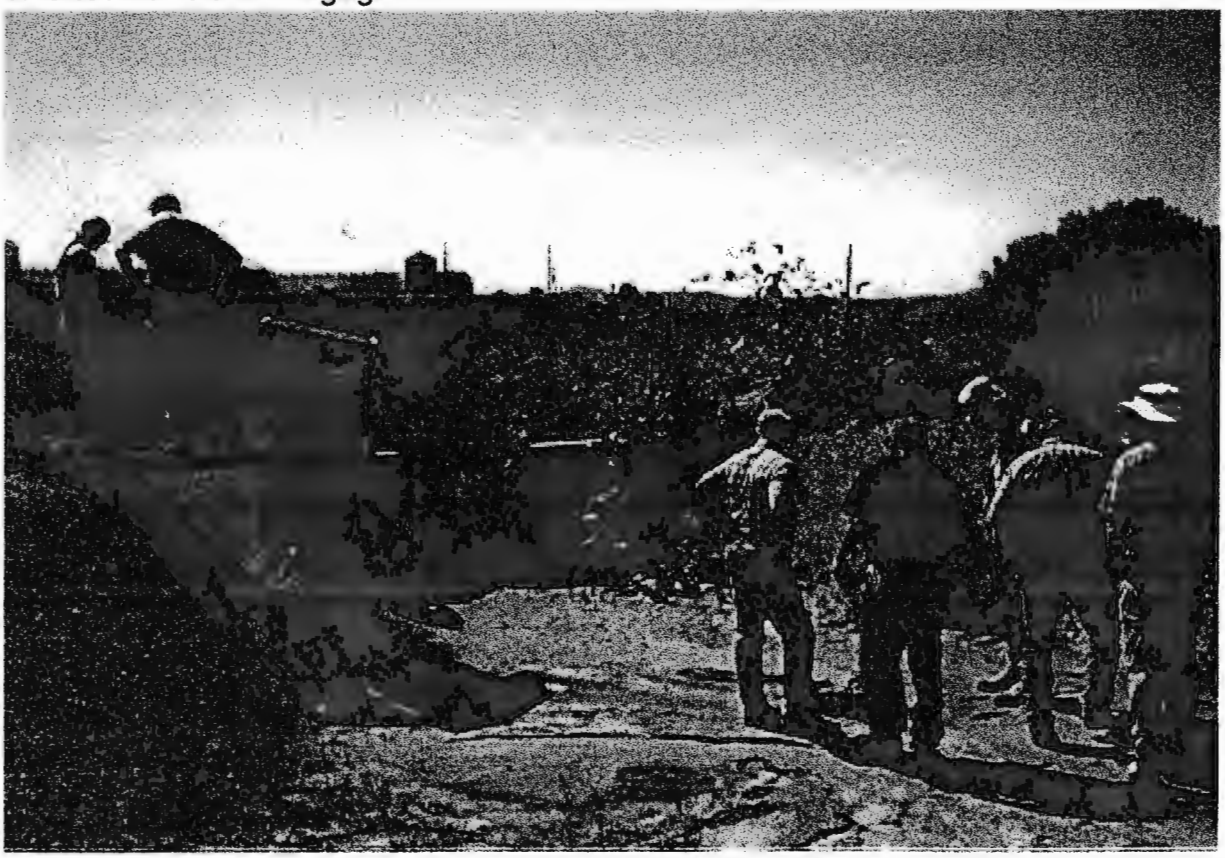


Photo 6 is looking south-south-west from rock apron below Building 375 across natural drainage channel mentioned in previous recommendation. Soil pile in right center of photograph is sediment previously collected by silt fence. Silt fence was removed due to storm damage and soil stockpiled prior to planned silt fence replacement. Bare soil below rock apron is Pit 24 cover. Eroded gage station shown in Photo 7 is located at head of drainage down-gradient from soil pile.

Recommendations:

- The silt fence network should be extend to just below regraded cover over Pit 24.
- The breached gage station in drainage should be repaired and utilized as a storm water runoff detention basin.

Note: By August 4, the breached gage station had been repaired by positioning four loads of large rock in and below the breach. The silt fence network was also extended below Pit 24 (Photos 15 & 16).

Photo 8 was taken from below cobble apron at Building 375, down-gradient from Pit 24, looking southeast at silt fence. Note that soil has been graded into a pile along base of silt fence. This practice reduces the silt fence's capacity to trap sediments and places excessive stress on the fence under storm water loading. Photo 9 shows where water has breached under this silt fence. Main drainage (canyon) below silt fence and TWISP container storage domes A, B, and C in background leads to storm water monitoring station 3.

Photo 8 Looking southeast from rock apron below Building 375

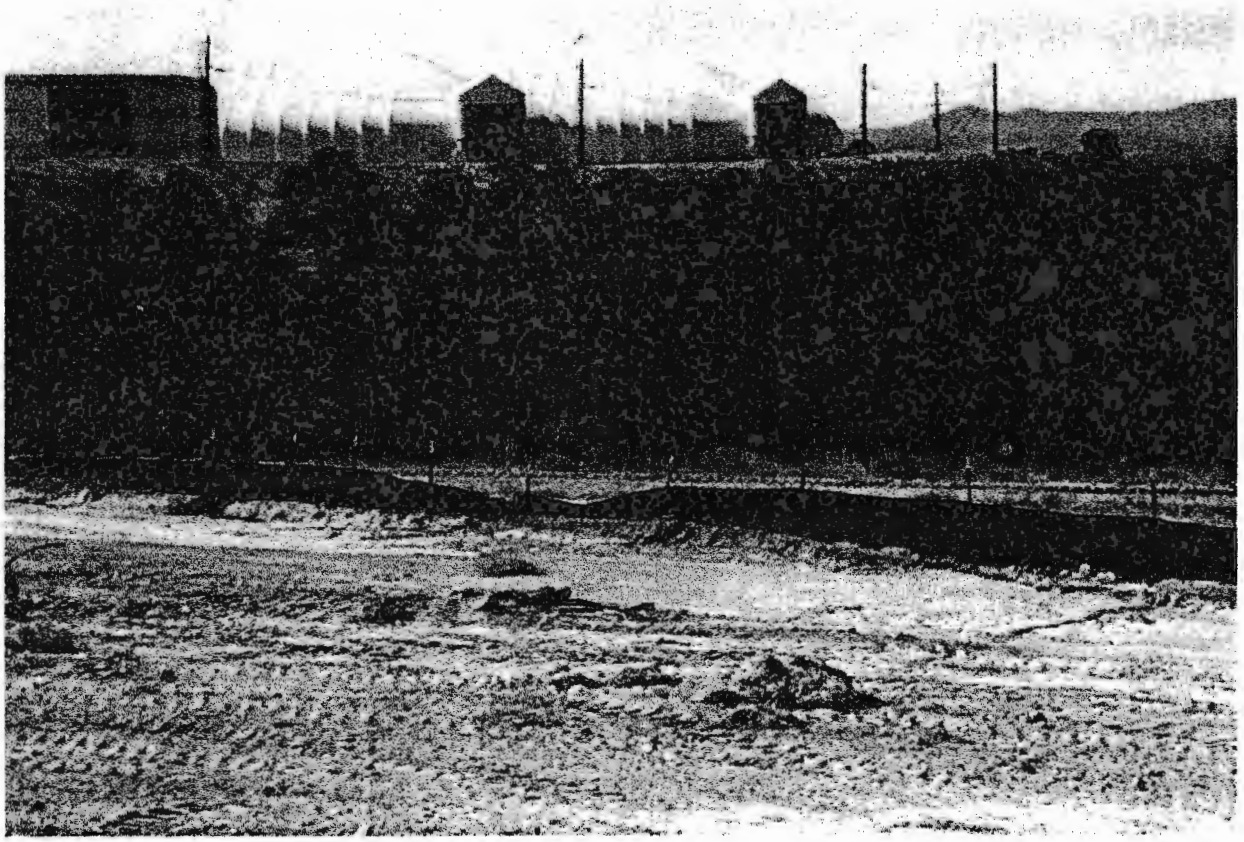


Photo 9

In Photo 9 Steve Mees, Assistant Facility Manager, Shawn Philips, TA-54 Storm Water Coordinator, and Ralph Ford-Schmid, DOE OB, discuss silt fence construction and maintenance. Note soil graded up against silt fence and breach in fence.

Recommendation:

The facility should follow installation and maintenance procedures outlined in LANL's BMP guidance document to ensure BMPs perform up to their optimum capacity.

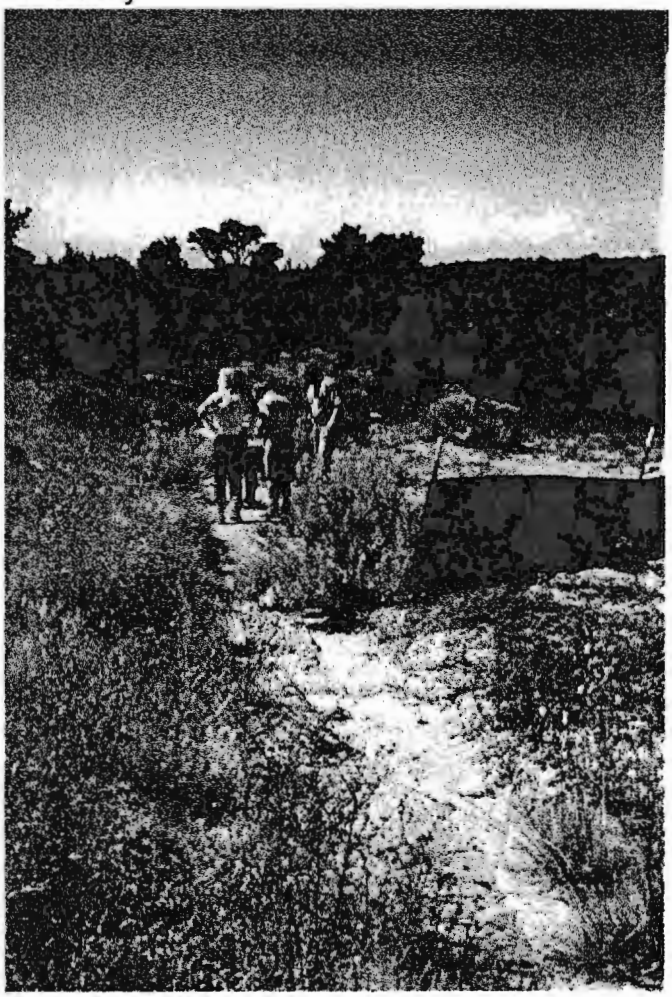
Note: On the August 4th inspection, this silt fence had been replaced and properly installed. This silt fence is now one of a series of silt fences (Photos 15 & 16). Steve Mees assured us that in the future, any dirt graded up against silt fences will be removed by hand.

Photo 10

Photo 10 is looking northwest at Building 375 from drainage below Shaft Area 124. This drainage received storm water runoff from the area where contaminated surface soils (266 pCi/g Pu-239, 166 pCi/g Am-241) were exposed for over one year (Steve Mee & Steve Rae September 21, 1999 letter to Steve Yanicak).

The exposed, contaminated surface soils were discovered after nearby air monitoring stations showed readings above LANL Waste Site investigation and alert levels within several months of relocating and regrading of the road and trenching for a fire protection water line.

Photo 11 Looking south, monitoring station G-3 located in drainage (in background), at site boundary



The drainage in Photo 10 bypassed downstream silt fences (Photo 11) until it left the TA-54 facility near storm water monitoring station G-3. The silt fence at G-3 was breached and the monitoring station was buried during the June 17, 1999 storm event (200 year rain event).

Recommendations:

A series of multiple silt fences in this reach would slow runoff, drop sediments, and help protect downstream silt fences and detention basins.

Note: By August 4th, multiple silt fences had been installed in this drainage (Photos 15 & 16).

Photo 12 From road near Shaft Area 124 looking south

Photo 12 was taken from east of Building 375 near Shaft Area 124 looking south at north/south oriented silt fence below container storage Domes C and D which are shown in left side of photograph.

The silt fence shown in Photo 13 was filled in with eroded slope materials (sands and gravels) and is located in the center of Photo 12 and is obscured by brush. The drainage described in preceding photographs ten and eleven is located in right side of Photo 12.

Photo 13 Looking southwest towards drainage leading towards storm water monitoring station G-3

Photo 14 Looking west across same filled silt fence in Photo 13

Recommendations:

This silt fence (Photos 13 & 14) is no longer able to function properly due to excessive sediment accumulation. Silt fences should be cleaned out and repaired when sediment accumulation reaches one third to one half of the fence capacity.

Note: By August 4, 1999, this silt fence was replaced and the slope above it was regraded resulting in gentler slope up gradient of the fence (Photos 15 & 16).

Photo 15 Taken from the same location as Photo 14 on August 4, 1999

Photo 16 Additional silt fences and grade modifications installed by August 4th

Photo 17 TWISP Pad 4 TRU waste retrieval operations

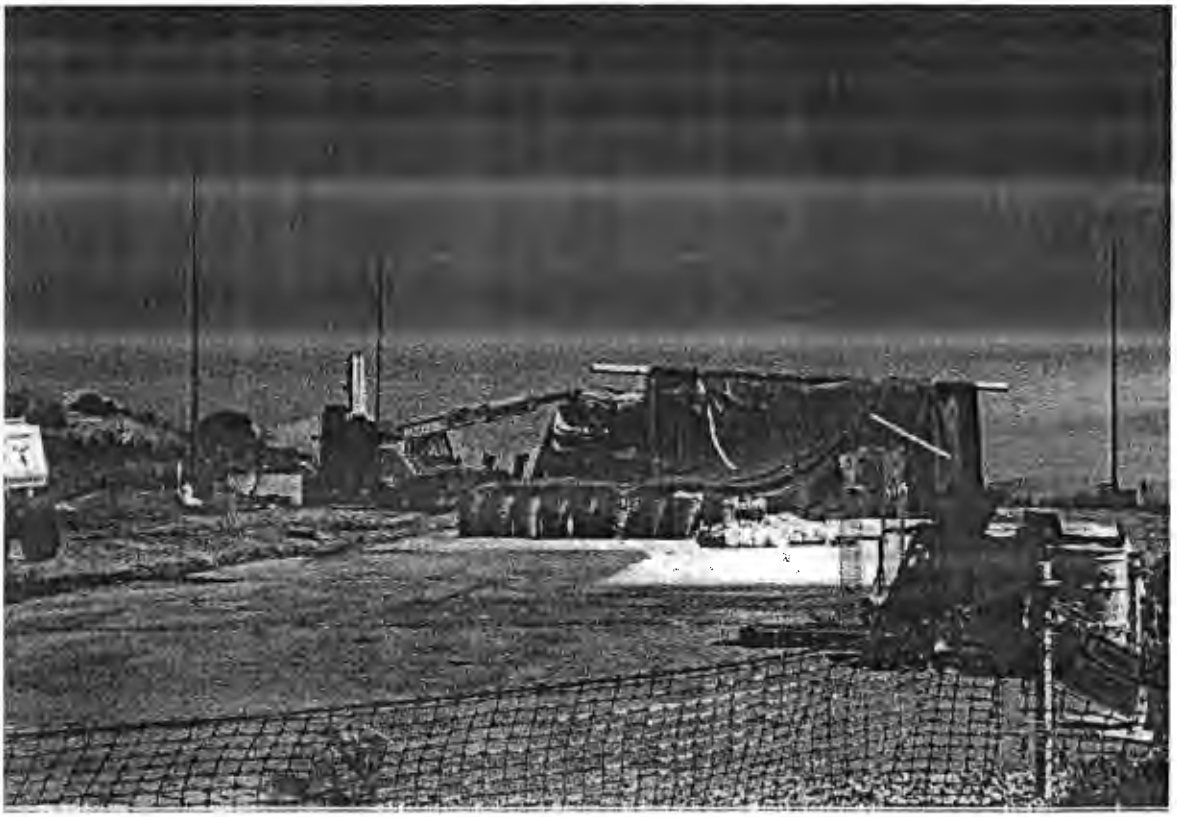


Photo 18

Photo 17 is taken at container storage Pad 4 looking north at TWISP mixed waste container recovery operation. Yellow barrels in foreground are staged for field monitoring before packaging and storage until transported to WIPP.

Photo 18 was taken from the same location as photograph 17 but on a on different day. Both photos are looking north at TRU waste container storage area Pad 4.

Bermed soil to right of loader is intended to direct runoff towards left in into silt fence shown in Photo 19.

The orange fence is at the heavy equipment access to Pad 4 Area. The coarse gravel berm under orange fence acts as run-off control (traps fine sediment and directs runoff to silt fence in Photo 19) yet allows heavy equipment passage.

Recommendations:

- The berm of soil (Photo 17) could be replaced with temporary, movable barriers. ESH-18 has tested several types of barriers (e.g., Triangular Silt Dike, Straw Wattles) that may be appropriate to use in this instance.
- The Triangular Silt Dike barrier may provide better protection than the coarse gravel berm used at the heavy equipment access.

Photo 19 Silt fence located down gradient from TWISP Pad 4

Photo 19 shows the silt fence down gradient from TWISP Pad 4 area. The silt fence was functioning properly and was bulging from the sediment it had already collected. The level of sediment buildup was less than one-third to one-half the capacity of the fence. The DOE Oversight Bureau collected a split sample of the sediment with ESH-18 the following day, 7/29/99, and the data is provided in Tables 1 & 2.

Levels of Zn, Pu-239, & Am-241 were slightly above background levels determined by the Environmental Restoration Project (1998) and those reported in the 1998 LANL Environmental Surveillance Report.

Recommendation:

- TA-54 personnel should discuss this data (and ESH-18 split data) with the Hazardous and Radioactive Materials Bureau (HRMB) to determine if HRMB has any disposal requirements for these sediments.

Tables 1 & 2. Results of Total Metal and Radionuclide Analysis of Sediments Captured by Silt Fence Below the TWISP (Pad 4)

Table 1. Total Metal Analysis of TA-54, TWISP sample collected July 29,1999. (mg/kg)

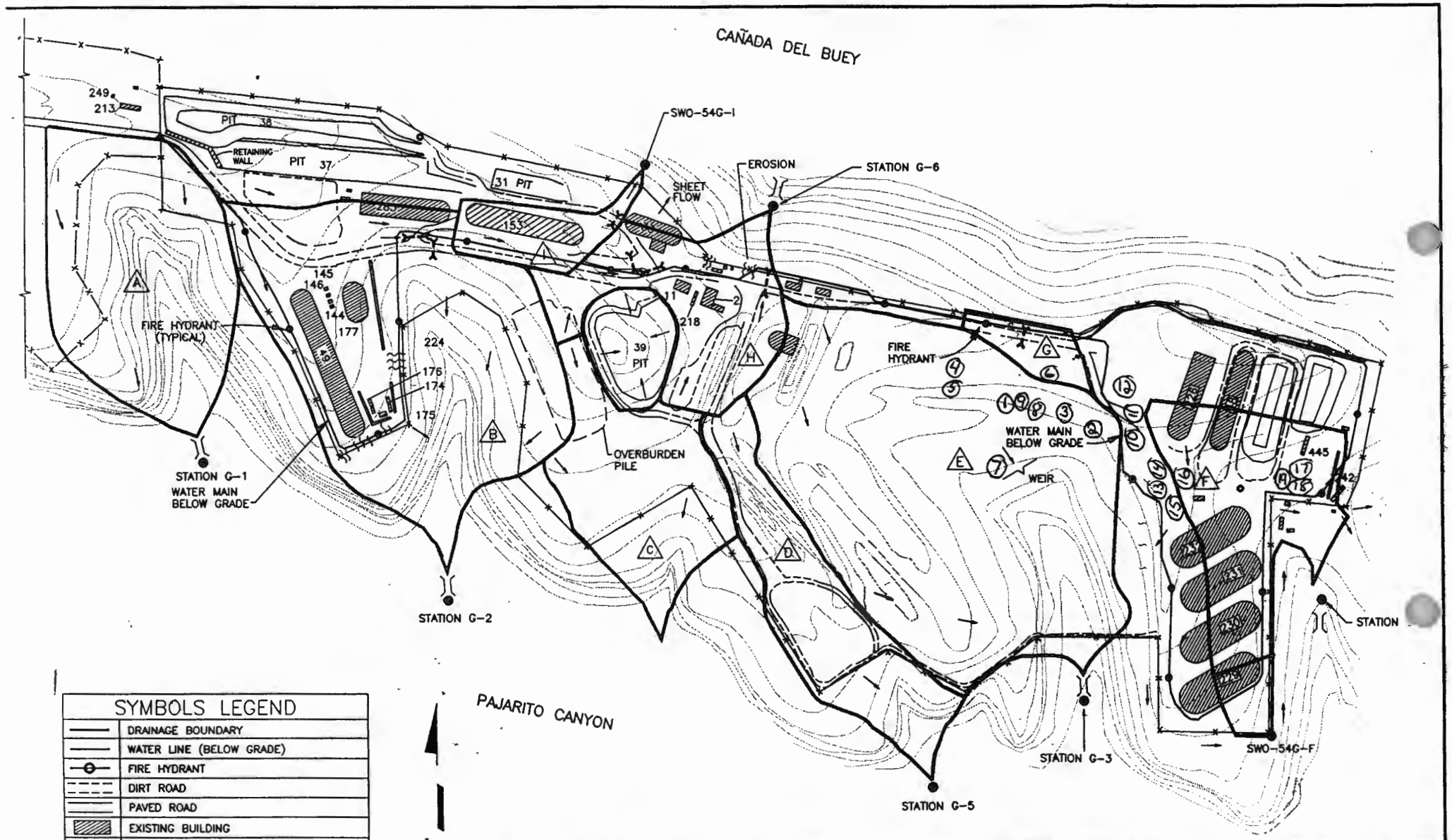
Analyte	Al	Sb	Ar	Ba	Be	Cd	Ca	Cr	Co	Cu	Fe	Pb
Result	4,700	ND	3.2	70	0.68	ND	2,900	6.5	2.2	8.7	7,700	15
Reporting Limit	20	2	1	10	0.51	0.51	100	1	1	1	10	0.31
Background (ER)	29,200	0.83	8.17	295	1.83	0.4	6,120	19.3	8.64	14.7	21,500	22.3
Analyte	Hg	Mg	Mn	Ni	K	Se	Ag	Na	Tl	V	Zn	
Result	ND **	1100	210	4.8	790	ND	ND	ND	ND	8.8	55	
Reporting Limit	0.1	100	1	2	100	0.51	1	100	1	1	2	
Background (ER)	0.1	4610	671	15.4	3,460	1.52	1	915	0.73	39.6	48.8	

Results reported in dry weight
** = Did not meet method holding time
Metal analysis by Trace ICP method 6010B, digested by method 3050B
Mercury analysis by Cold Vapor (CVAA), digested by method 7471A
Background (ER) = R.T. Ryti et.al., 1998, Inorganic and Radionuclide Background Data for Soils

Table 2. Radionuclide Analysis of TA-54, TWISP sample collected July 29, 1999. (pCI/g)

Analyte	Pu-238		Pu-239		Am-241		Cs-137
Result	0.024		0.164		0.217		ND
Uncertainty (2 Sigma)	0.014		0.038		0.051		0.2
Background (ER)	0.023		0.054		0.013		1.65
Background (ES)	0.006		0.023		0.09		0.44

Results reported in dry weight
Reporting uncertainties are the Estimated Total Propagated Uncertainty (2 Sigma)
Plutonium and Americium analyzed by alpha spectrometry
Cesium analyzed by gamma spectrometry
Background (ES) = Radionuclide background as reported in the 1998 Environmental Surveillance Report
Background (ER) = R.T. Ryti, et.al., 1998, Inorganic and Radionuclide Background Data for Soils



REVISIONS

NO.	BY	DATE	REMARKS
1	SFE	9/95	SWPPP MODIFICATION
2	SFE	1/96	SWPPP MODIFICATION
3	SFE	9/96	SWPPP MODIFICATION

DRAWN MEW
DESIGNED SJV
CHECKED SJV
APPROVED

SCALE: 1"=250'-0"
PLOT DATE 09/25/96
CREATION DATE 09/21/95
DRAWING FILE NAME 54G-SHT6.DWG

Santa Fe Engineering Limited
1428 Second St. Santa Fe, NM 87505
(505) 988-7438 fax: (505)983-5608

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

REQUESTING GROUP ESH-18
LAB JOB NO. 5030.05

TA-54
SITE DRAINAGE MAP
AREA G – FIRE HYDRANTS

DRAWING NUMBER FIGURE 1

SHEET 6 of 6
REV 0