

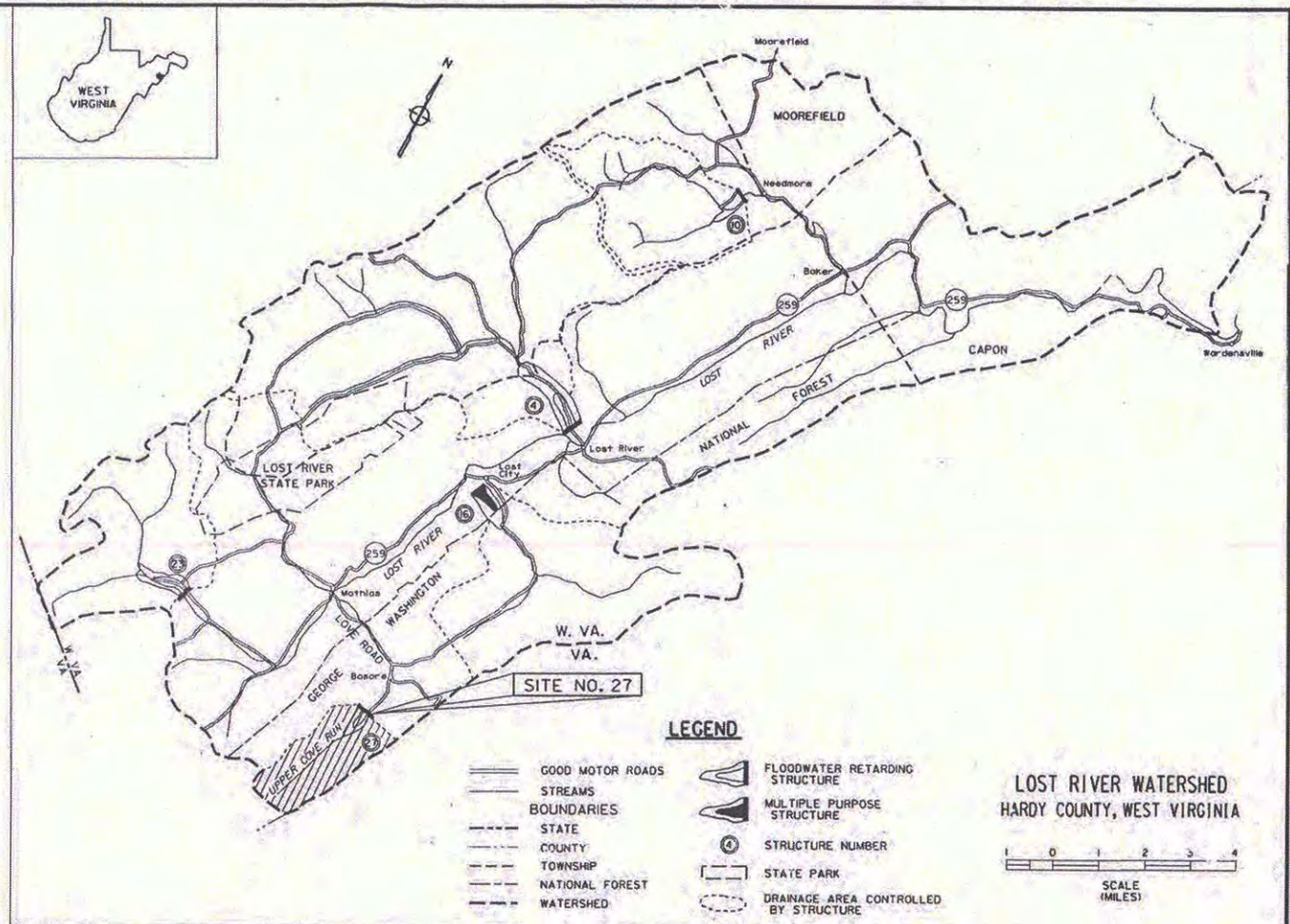
LOST RIVER SUB-WATERSHED OF THE POTOMAC RIVER WATERSHED PROJECT SITE No. 27 HARDY COUNTY, WEST VIRGINIA

DRAINAGE AREA	2,403 ACRES
FLOOD STORAGE TO EMERGENCY SPILLWAY CREST	498 ACRE FEET
WATER SURFACE AREA AT PERMANENT POOL	7.2 ACRES
HEIGHT OF DAM	75 FEET
VOLUME OF FILL	357,500 CUBIC YARDS

SOIL CONSERVATION SERVICE
of the
U. S. DEPARTMENT OF AGRICULTURE
cooperating with
POTOMAC VALLEY SOIL CONSERVATION DISTRICT
HARDY COUNTY COMMISSION
WEST VIRGINIA STATE SOIL CONSERVATION COMMITTEE
1994

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13.	DRAIN OUTLET DETAILS	39.	GUTTER AND WATERWAY DETAILS
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15.	EMERGENCY SPILLWAY PROFILE	40A.	PERMANENT SEEDING LIMITS FOR ADDITIONAL WASTE AREAS #1#2
16.	EMERGENCY SPILLWAY SECTIONS	40B.	SURVEY FOR PERMANENT SEEDING QUANTITIES
17.	PRINCIPAL SPILLWAY - PLAN & PROFILE	41.	FENCING DETAILS
18.	PRINCIPAL SPILLWAY SECTIONS	42.	MISCELLANEOUS DETAILS
19.	PRINCIPAL SPILLWAY - OUTLET DETAILS	43.	LOGS OF DRILL HOLES
20.	RISER STRUCTURAL DETAILS - SHEET 1 OF 4	44.	LOGS OF DRILL HOLES AND TEST HOLES
21.	RISER STRUCTURAL DETAILS - SHEET 2 OF 4	45.	LOGS OF TEST HOLES
22.	RISER STRUCTURAL DETAILS - SHEET 3 OF 4	46.	LOGS OF BORE HOLES - SHEET 1 OF 3
23.	RISER STRUCTURAL DETAILS - SHEET 4 OF 4	47.	LOGS OF BORE HOLES - SHEET 2 OF 3
24.	CONDUIT & CRADLE DETAILS	48.	LOGS OF BORE HOLES - SHEET 3 OF 3
25.	STEPPED CHANNEL TRASHRACK DETAILS	49.	LOGS OF TEST PITS - SHEET 1 OF 3
26.	RISER LADDER DETAILS	50.	LOGS OF TEST PITS - SHEET 2 OF 3
		51.	LOGS OF TEST PITS - SHEET 3 OF 3

GANNETT FLEMING, INC.
HARRISBURG, PENNSYLVANIA



Construction Completion Date: 10/14/98

Contractor:
Kanawha Stone Company, Inc.
P.O. Box 503
Nitro, Wv. 25143

Contract No.:
50-SSCC-5-6

Government Representative:
Roger L. Sites

Inspectors:
Michael S. Allen
Gundy Edmonds
David T. Hoffman
David S. Pierce



William Bingham

"As Built"

REVISION NUMBER	SHEET NUMBER	REVISION	REVISION DATE	REVISION BY
2	3	SLOPE CHANGE, ESW	9/95	W.F.C.
1	2,14,20,37	GENERAL REVISIONS	4/95	W.F.C.
1	13,16,24,27,28	LOCATION OF WATER SUPPLY PIPE	4/95	W.F.C.

LOST RIVER SUB-WATERSHED
SITE NO. 27
HARDY COUNTY, WEST VIRGINIA

COVER SHEET

**U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE**

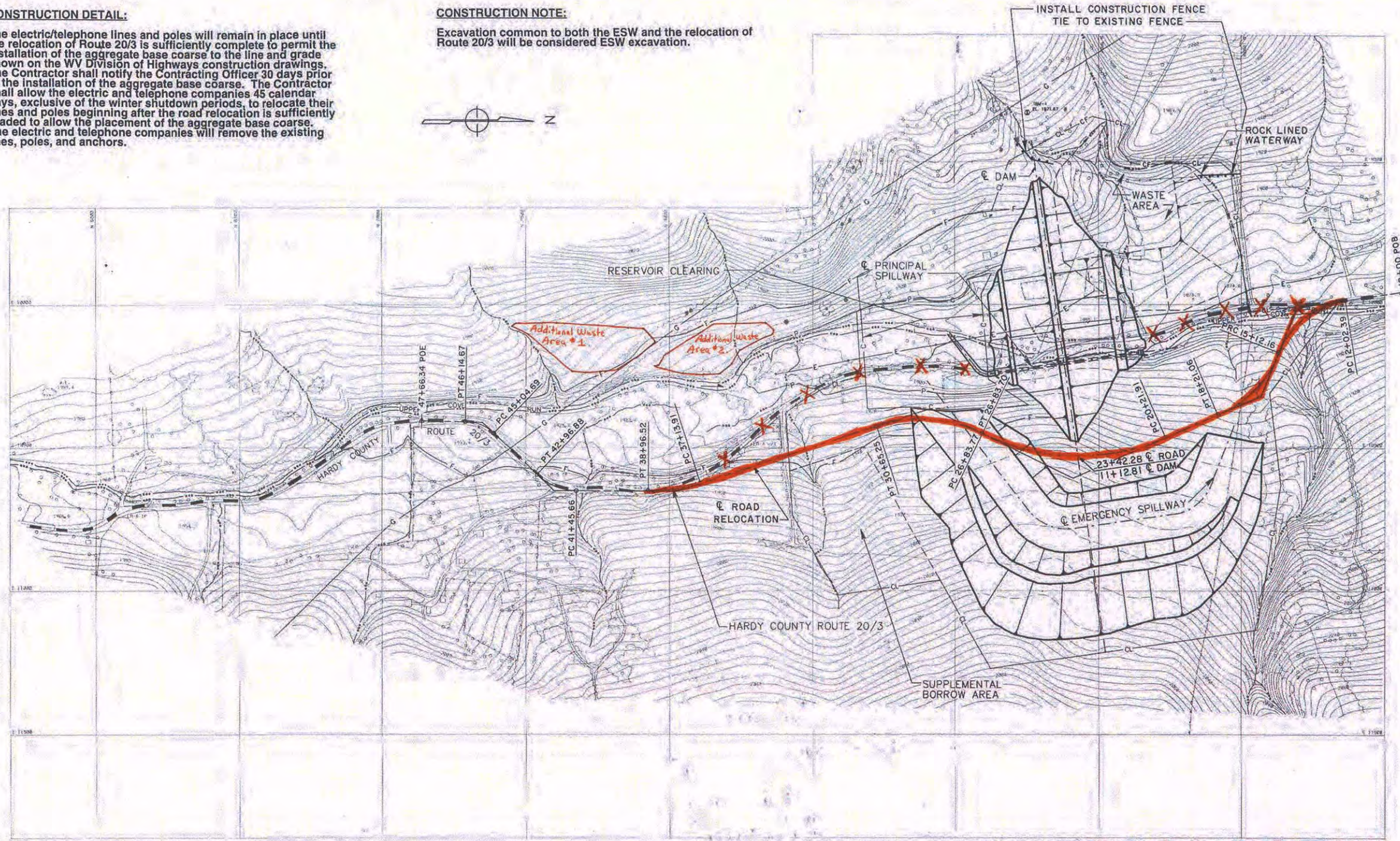
Designed <u>R.E. Holderbaum</u>	Date <u>6/94</u>	Approved <u>[Signature]</u>	Title <u>STATE CONSERVATION ENGINEER</u>
Drawn <u>K.P. Dundore</u>	Date <u>6/94</u>	Checked <u>[Signature]</u>	Title <u>HEAD, ENGINEERING STAFF, NNTC</u>
Traced <u>C.A.D.O.</u>	Date <u>6/94</u>	Sheet No. <u>1</u>	Drawing No. _____
Checked <u>P.G. Schweigler</u>	Date <u>6/94</u>	of <u>51</u>	

CONSTRUCTION DETAIL:

The electric/telephone lines and poles will remain in place until the relocation of Route 20/3 is sufficiently complete to permit the installation of the aggregate base course to the line and grade shown on the WV Division of Highways construction drawings. The Contractor shall notify the Contracting Officer 30 days prior to the installation of the aggregate base course. The Contractor shall allow the electric and telephone companies 45 calendar days, exclusive of the winter shutdown periods, to relocate their lines and poles beginning after the road relocation is sufficiently graded to allow the placement of the aggregate base course. The electric and telephone companies will remove the existing lines, poles, and anchors.

CONSTRUCTION NOTE:

Excavation common to both the ESW and the relocation of Route 20/3 will be considered ESW excavation.



NOTE: THE \odot FOR THE RELOCATION OF RTE. 20/3 IS SHOWN FOR INFORMATION ONLY. LAYOUT DATA FOR THE RELOCATION OF RTE. 20/3 SHALL BE OBTAINED FROM THE WV DOH CONSTRUCTION DRAWINGS.

Construction Completion Date: 10/14/98

LEGEND

- \triangle LR-5 IP SURVEY BASELINE LOCATION AND IDENTIFICATION NUMBER
- \odot TBM #1 TEMPORARY BENCHMARK LOCATION AND IDENTIFICATION NUMBER
- \times UTILITY POLE
- E-E- O.H. ELECTRIC LINE
- G-G- FENCE
- G-G- GAS PIPELINE
- ~~~ TREE LINE
- STREAM/DRAIN
- CL- CONSTRUCTION LIMITS
- P- PERMANENT POOL (EL. 1909.8 FT.)
- F- FLOOD POOL (EL. 1939.9 FT.)
- C- CLEARING LIMITS
- CF- CONSTRUCTION FENCE

"As Built"



TOPOGRAPHIC MAPPING
PERFORMED BY L. ROBERT KIMBALL, INC. 1993
BASED ON AERIAL PHOTOGRAPHY

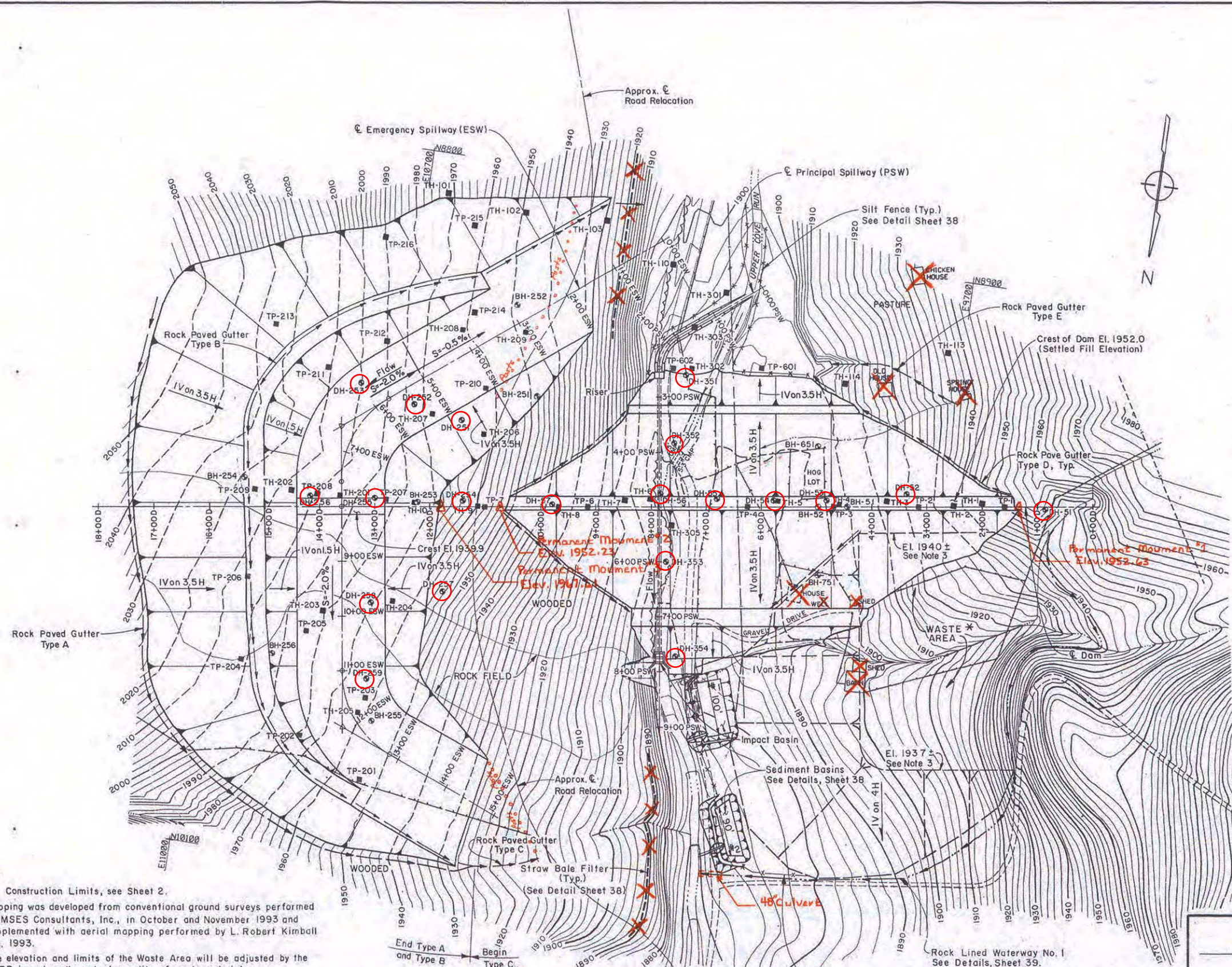
REV. # 1, BY W.F.CONLEY 4/95



GANNETT FLEMING, INC.
HARRISBURG, PA

William B. Bingham

LOST RIVER SUB-WATERSHED SITE NO. 27 HARDY COUNTY, WEST VIRGINIA			
GENERAL PLAN			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
DESIGNED	G. W. WARREN	DATE	6/94
DRAWN	JODY FLEMING	DATE	6/94
TRACED	C.A.D.D.	DATE	6/94
CHECKED	R. E. HOLDERBAUM	DATE	6/94
APPROVED BY		TITLE	
SHEET NO. 2		DRAWING NO.	
OF 51			



LEGEND

- STRAW BALE FILTER
- ROCK LINED WATERWAY
- ROCK PAVED GUTTER
- SILT FENCE OR GEOTEXTILE
- EXISTING ROAD OR DRIVE
- TOP OF ROCK
- EXISTING GROUND/LIMIT OF EXCAVATION
- ⊕ SECTION CUT DESIGNATION (A-SECTION LETTER, II-SHEET WHERE SECTION IS CUT OR SHOWN)
- RIPRAP
- × 1920.3 SPOT ELEVATION
- EXCAVATION OR FILL SLOPE
- CENTERLINE
- EXISTING CONTOUR ALTERED BY PROPOSED CONSTRUCTION
- EXISTING OR PROPOSED CONTOUR
- ⊕ BH-1 BORE HOLE OR DRILL HOLE LOCATION AND IDENTIFICATION NUMBER
- ⊕ TP-1 TEST PIT OR TEST HOLE LOCATION AND IDENTIFICATION NUMBER
- ⊕ UTILITY POLE
- O. H. ELECTRIC LINE
- GAS PIPELINE
- FENCE
- TREE LINE
- STREAM/DRAIN

"As Built"

NOTES:

1. For Construction Limits, see Sheet 2.
2. Mapping was developed from conventional ground surveys performed by MSES Consultants, Inc., in October and November 1993 and supplemented with aerial mapping performed by L. Robert Kimball Inc. 1993.
3. The elevation and limits of the Waste Area will be adjusted by the COTR based on the actual quantity of waste material.
4. For Rock Paved Gutter details, see Sheet 39.
5. Actual location of Sediment Basins to be approved in the field by the COTR.
6. Type C Rock Paved Gutter connects to Road Ditch.



Silt Fence to Continue along Toe of Slope with Additional Rows Installed along Slope at Horizontal Intervals of ±100 Feet. Maintain Until Vegetation is Established.

Construction Completion Date: 10/14/98

* All disturbed portions of the designated Waste Area shall be covered with a minimum of 2 feet of earth cover.

REV. #2, BY W.F. CONLEY 9/95

LOST RIVER SUB-WATERSHED
SITE NO. 27
HARDY COUNTY, WEST VIRGINIA

DAMSITE PLAN

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	P. Schweiger	Date	6/94	Approved by	
Drawn	W. Olberg	Date	6/94	Title	
Traced	W. Olberg	Date	6/94	Title	
Checked	R. Holderbaum	Date	6/94	Sheet No. 3 of 51	Drawing No.

William B. Bingham

DH #256 (Cont'd)

43.2 - 63.5 Shale; gray to dark gray, interbedded with limy shale, medium to fine grain, unweathered, mod. soft, bedding not well defined, thin clay filled fracture 45.2 on 45° angle; calcite filled joint or fracture 44.0-45.0, 47.5-47.6, 48.1-48.2, 49.6-49.9, 53.2-53.5, 58.2

63.5 Bottom of hole

Water Level - 1968.4

DH #257 Elev. 1954.4

0.0 - 1.0	Silt; cobbly, dark gray, moist, soft, max. particle size 2.0", subangular coarse to med. grain sand, organic, topsoil - ML	0.0- 5.0 5.0- 6.5 6.5-10.0 10.0-11.5 11.5-24.5	N= SB 33 SB 5 SB	RQD 73% 76% 80%
1.0 - 3.0	Silt; cobbly, max. particle size 24.0", dark brown, 40% sandstone subangular cobbles, firm, med. to low plasticity fines, colluvial ML	24.5-26.0 26.0-28.5 28.5-31.5	Nx= 87% 100% 100%	RQD 73% 76% 80%
3.0 - 24.5	Clay; silty, max. particle size 3.0", less than 5% gravel, brown to dark brown, med. plasticity fines, firm, lensed, alluvial - ML/CL			
24.5 - 31.5	Shale; dark gray, med. to fine grain, highly weathered to 25.0, then mod. weathered, dark gray, bedding pattern not well defined, calcite filled fractures up to 1.5" from 25.2-26.2, 28.5-29.1, Fe stained joints & fractures, 27.0-27.3, 28.7-30.5 (open fractures), good cores 24.8-26.8			
31.5	Bottom of hole			

Water Level - 1935.4

DH #258 Elev. 1970.8

0.0 - 5.0	Sand; silty, reddish, mottled, about 30% low plastic fines - SM	0.0- 3.5 3.5- 5.0 5.0- 8.5	N= RB 49 RB	RQD 32% 90% 100%
5.0 - 22.5	Clay; silty, very fine sandy, mottled olive & red, soft, silty seams below 15.0', occasional sandstone gravel or cobble - CL	8.5-10.0 10.0-13.5 13.5-15.0 15.0-22.5	N= RB 22 RB 3 RB	RQD 32% 90% 100%
22.5 - 23.5	Shale; gray, mod. soft, mod. weathered, Fe stain in 150' bedding planes, vertical & 300' fractures	22.5-25.0 25.0-30.0 30.0-35.0	Nx= 96% 100% 100%	RQD 32% 90% 100%
23.5 - 35.0	Shale; gray, limy, with thin 2.0-4.0" limestone seams, thin wavy calcite filled fractures, massive cores, Fe stain in joints & fractures to 30.1, 15 & 450' joints, mod. soft to mod. hard, Martinsburg shale			
35.0	Bottom of hole			

Water Level - 1963.6

DH #259 Elev. 1965.3

0.0 - 5.0	Sand; silty, mottled reddish brown & olive, about 30% med. plastic fines, cobbles on surface, terrace SM	0.0- 3.5 3.5- 5.0 5.0- 8.5 8.5-10.0 10.0-13.5 13.5-15.0	N= RB 17 RB 13 RB 7	RQD 40% 96% 100% 100%
5.0 - 15.0	Clay; silty, sandy, moist, med. plastic, about 20% fine sand with soft silty seams - CL	15.0-17.0 17.0-22.0	Nx= 25% 100%	RQD 0% 82%
15.0 - 17.0	Shale; highly weathered, mod. soft to soft, numerous soft clay seams which wash out, broken angular core fragments, olive & iron stained	22.0-27.0	Nx= 100%	RQD 100%
17.0 - 27.0	Shale; gray, limy, mod. soft to mod. hard, interbedded with thin 2.0-4.0" limestone seams, wavy random calcite filled fractures, 450', Fe stained joint at 23.0', good cores in 3.0" to 2.5" sticks			
27.0	Bottom of hole			

DH #351 Elev. 1892.6

0.0 - 6.0	Gravel; silty, sandy, 25-35% low plasticity fines, subrounded sandstone gravel & cobbles, approximately 25% cobbles & boulders, max. particle size 3.0", lensed GM	0.0- 6.0 6.0- 8.5 8.5-13.5 13.5-18.5 18.5-23.5 23.5-28.5 28.5-33.5	N= RB 92% 100% 100% 100% 100% 100%	RQD 92% 100% 100% 100% 96% 100%
6.0 - 33.5	Shale; gray to dark gray, interbedded with limy shale, med. to fine grain, unweathered, mod. soft to mod. hard, bedding planes not defined, good cores, mud filled fracture 47.5-47.7, massive, thin calcite seams 7.6, 12.8, 17.0, 20.5, 23.7, 27.2, Martinsburg shale			
33.0	Bottom of hole			

Water Level - 1890.0
Date - May 10, 1976

DH #352 Elev. 1890.6

0.0 - 8.5	Gravel; sandy, wet, subrounded gravels, cobbles & boulders, 30% sand, about 10% nonplastic fines, max. particle size 1.5", well graded gravel, cobbles & boulders GM/GP	0.0- 8.5 8.5-13.5 13.5-18.5 18.5-23.5 23.5-28.5 28.5-33.5	N= RB 90% 100% 98% 100% 100%	RQD 90% 100% 98% 100% 100%
8.5 - 33.5	Shale; gray to dark gray, med. to fine grain, mod. weathered to 15.3, unweathered 15.3-33.5, mod. soft, massive, bedding not well defined, vertical calcite seam 11.5-13.5, also 26.4-26.5, breaks on approximately 10-150 angle, some Fe stain 11.5 to 13.5			
33.5	Bottom of hole			

Water Level - 1887.1
Date - May 11, 1976

Pressure Test Data

10.0 - 15.0	13.6 gpm @ 10 psi
15.0 - 20.0	0.1 gpm @ 10 psi
20.0 - 35.5	0.0 gpm @ 10 psi

DH #353 Elev. 1882.2

0.0 - 3.5	Cobbles; max. particle size 24", 60-70% sandstone, limestone & shale cobbles, subangular to sub-rounded, 25 to 35% gravel, 5% sand, alluvial, bed load - GP	0.0- 3.5 3.5- 4.8	N= RB RB	RQD 24% 61% 79% 100% 100%
3.5 - 14.0	Shale; limy, gray, silt texture, highly weathered, mod. soft, numerous Fe stained fractures, massive formation, clay filled seams, especially at 12.3-12.5, cores 1/2" to 1", occasional calcite seam 1/8"	12.5-14.0 14.0-18.3 18.3-23.3 23.3-28.3 28.3-33.5	Nx= 65% 100% 100% 100% 98%	RQD 24% 61% 79% 100% 100%
14.0 - 26.2	Shale; limy, gray, silt texture, mod. weathered, mod. soft, massive, occasional Fe stained vertical fractures, good cores, occasional calcite seams			
26.2 - 33.5	Shale; limy, gray, silt texture, unweathered, mod. hard, massive, occasional small calcite seam			
33.5	Bottom of hole			

Water Level - 1881.1
Date - April 16, 1976

Pressure Test Data

6.0 - 10.0	10.0 gpm @ 10 psi
10.0 - 15.0	8.0 gpm @ 8 psi
15.0 - 20.0	5.0 gpm @ 5 psi
20.0 - 33.5	0.5 gpm @ 0.5 psi

DH #354 Elev. 1881.2

0.0 - 5.0	Gravel; silty, sandy, cobbly, dark brown, approximately 10% nonplastic fines, 25% med. to fine sand, subrounded sandstone gravels and cobbles, max. 2.5" diameter, wet, alluvium - GM	0.0- 5.0 5.0- 9.0 9.0-14.0 14.0-19.0 19.0-24.0 24.0-29.0	N= RB RB	RQD 40% 96% 100% 100% 100% 100%
5.0 - 29.0	Shale; gray to dark gray, med. to fine grain, mod. weathered to 9.2 then unweathered, mod. soft, bedding planes not evident, calcite seams 22.9-23.1 & 25.4, massive cores below 7.2, breaks on approximately 45° angles, Martinsburg shale			
29.0	Bottom of hole			

Water Level - 1877.2
Date - May 10, 1976

Pressure Test Data

5.0 - 10.0	11.4 gpm @ 15 psi
10.0 - 29.0	3.7 gpm @ 15 psi

LEGEND - TEST HOLE NUMBERING SYSTEM

- Centerline of Dam 1 - 99
- Borrow Area 101 - 199
- Emergency Spillway 201 - 299
- Centerline of Outlet Structure 301 - 399
- Stream Channel 401 - 499
- Relief Wells 501 - 599
- Foundation Drain 601 - 699

UNIFIED SOIL CLASSIFICATION SYSTEM SYMBOLS

- GW Well graded gravels; gravel-sand mixtures
- GP Poorly graded gravels
- GM Silty gravels; gravel-sand-silt mixtures
- GC Clayey gravels; gravel-sand-clay mixtures
- SW Well graded sands; sand-gravel mixtures
- SP Poorly graded sands
- SM Silty sands; sand-silt mixtures
- SC Clayey sands; sand-clay mixtures
- ML Silts; silty, very fine sands; sandy or clayey silts
- CL Clays of low to medium plasticity; silty, sandy or gravelly clays
- CH Clays of high plasticity; fat clays
- MH Elastic silts; micaceous or diatomaceous silts
- OL Organic silts and organic silty clays of low plasticity
- OH Organic clays or silts of medium to high plasticity

KEY TO DRILL HOLE LOGS

- N Number of blows required for 1 foot standard penetration using 2.0" O.D. split barrel sampler, 140 lb. hammer, and 30" drop. ASTM D-1586
- Nx Rock core, 2-1/8" diameter
- 9.0 Depth in hole (feet)
- CL Unified Soil Classification Symbol
- RB Roller bit to advance hole by wash boring
- 73% Percent rock core recovery in each drill run

All soil and rock descriptions and classifications were determined by visual examination.

TH #208 Elev. 1964.8

0.0 - 0.5 Silt; dark brown, moist, loose, nonplastic, organic, topsoil ML

0.5 - 4.5 Sand; clayey, gravelly, moist, reddish brown, mottled orange & olive, 30% med. plastic fines, 40% med. to fine sand, 30% angular to subrounded sandstone and shale gravels, max. 3.0" SC

4.5 - 9.6 Clay; silty, reddish brown, mottled orange and olive, moist, stiff, about 20% fine sand, 10% angular to subrounded gravels, max. 3" - CL

9.6 - 9.8 Shale; dark gray and black, platy angular pieces, soft to very soft with about 40% silty clay in bedding

9.8 Bottom of hole

TH #209 Elev. 1947.9

0.0 - 0.8 Silt; dark brown, loose, moist, organic

0.8 - 4.0 Sand; clayey, silty, reddish brown, mottled orange & olive, about 30% med. plastic fines, about 20% subrounded sandstone and shale gravels, max. 3", occasional cobble - SC

4.0 - 10.8 Clay; silty, reddish brown, mottled, med. plastic, about 15% fine sand, 10% subrounded gravel, max. 3", clay content increases and sand decreases with depth - CL

10.8 - 11.0 Shale; soft to very soft, dark gray, streaked black & Fe stained, clay filled bedding planes, "Martinsburg shale"

11.0 Bottom of hole

TH #301 Elev. 1895.3

0.0 - 0.8 Silt; sandy, dark brown, loose, moist, organic, topsoil - ML

0.8 - 5.5 Gravel; silty, sandy, dark brown, 20% low plastic fines, gravel is subrounded sandstone, about 25% cobbles and boulders, max. 1.5", water at 4.5', alluvial - GM

5.5 - 11.0 Gravel; silty, sandy, dark gray, wet, 20% low plastic fines, subrounded sandstone gravels & cobbles, 25% cobbles & boulders, max. 1.5", sand lenses, alluvial, river jack - GM

11.0 Bottom of hole, same material

TH #302 Elev. 1893.3

0.0 - 0.5 Silt; dark brown, moist, loose, organic, topsoil - ML

0.5 - 7.2 Gravel; dark brown, silty, sandy, about 30% low plastic fines, subrounded sandstone gravels and cobbles, about 25% cobbles and boulders, max. size 3.0' diameter, lensed with med. gravel lenses - GM

7.2 - 7.4 Shale; very dark gray, soft, platy, Martinsburg

7.4 Bottom of hole

TH #303 Elev. 1894.8

0.0 - 0.5 Topsoil, sand, silty, dark brown, loose, nonplastic fines-SM

0.5 - 6.5 Gravel; silty sandy, dark brown, moist, 25% nonplastic fines, well graded sand-gravel-cobble mix, max. size 2.5", subrounded sandstone, coarse, alluvium - GM

6.5 Shale; dark gray, platy, soft, bottom of hole

TH #304 Elev. 1890.1

0.0 - 6.5 Gravel; sandy, wet, subrounded gravel, cobbles and boulders, 30% sand, about 10% nonplastic fines, max. boulder 1.5", well graded gravel-cobble & boulder mix, creek bank - GM/GP

6.5 Bottom of hole on dark gray, platy, soft shale

TH #305 Elev. 1883.4

0.0 - 4.5 Gravel; sandy, cobbly, dark brown, about 10% nonplastic fines, 25% med. to fine sand, subrounded sandstone gravels & cobbles, max. 2.5' diameter, wet, creek bed, alluvium GM/GP

4.5 Bottom of hole on gray, hard shale

Construction Completion Date: 10/14/98

"As Bldg"



LOST RIVER SUB-WATERSHED
OF THE POTOMAC RIVER WATERSHED PROJECT
FLOODWATER RETARDING DAM NO. 27
HARDY COUNTY, WEST VIRGINIA
LOGS OF DRILL HOLES AND TEST HOLES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

INVESTIGATED BY	Date	Approved by
F.E. ONELLION	2-77	
TYPED BY	Date	Title
C. TENNANT	2-77	
Traced	N/A	Sheet No. 44
Checked	R.R. McCROBY	2-77

of 51

William B. Bingham