PLATEAU MINING COMPANY

REPLY TO

SPECIAL STIPULATIONS

STAR POINT MINES

MINING & RECLAMATION PLAN

APPROVED JAN. 21, 1982

PERMIT NUMBER UT. 0018

RECEIVED
FEB 22 1982
DIVISION OF
OIL, GAS & MINING

PLATEAU MINING COMPANY, INC.
ACT/007/006
STAR POINT MINES
COPY #4/STATE HISTORY

PLATEAU MINING COMPANY
A Subsidiary of Getty Mineral Resources Company
P.O. Drawer PMC Price, Utah 84501-0904
Telephone (801) 637-2875

February 17, 1982

Mr. James W. Smith, Jr.
Coordinator of Mine Land Development
Division of Oil, Gas and Mining
1588 West North Temple
Salt Lake City, Utah 84116

RE: MRP - Approval January 21, 1982 - Special Stipulations

Dear James,

Enclosed are the formal answers and replies to the special stipulations set in the January 21 approval of the Star Point Mines Mine Reclamation Plan.

Please review P.M.C.'s reply and if your agency has any additional concerns please feel free to contact me, or Mel Coonrod, our Environmental Coordinator.

Sincerely,

PLATEAU MINING COMPANY

Floyd Tucker
General Manager

FT/lm

Enclosure

SPECIAL STIPULATIONS

1] Within 30 days of acceptance of the Departmental approval of the Mining and Reclamation Plan, the permittee must submit to the regulatory authority * a map delineating the projected five-year underground mining plan for all three seams [Wattis, Middle and Hiawatha]. The map should distinguish the total permitted area for the five-year permit term by leases. The total amount of surface disturbances, present and projected for the five-year term, should also be delineated.

PMC REPLY: See Plates [1-2-3] Five Year Mining Sequence
See Plate [4] Disturbed Areas

2] If, during the course of mining activities, previously unidentified cultural resources are discovered, the applicant shall ensure that the site is not disturbed and shall cease land disturbing activities in the vicinity, and shall notify the regulatory authority. The operator shall ensure that the resource[s] is properly evaluated in terms of the National Register of Historic Places [NRHP] eligibility criteria [36 CFR 60.6]. Should a resource be determined eligible for listing in consultation with the regulatory authority and the State Historic Preservation Officer [SHPO], the operator shall confer with and obtain the approval of the regulatory authority and the Utah SHPO concerning the development and implementation of mitigation measures as appropriate.

PMC REPLY: Plateau Mining Company agrees to follow the procedures and course of action outlined in Stipulation #2.

3] The applicant shall undertake no surface disturbance in the areas listed below until [1] cultural resource inventory [inventories] of the areas is completed; [2] OSM receives an acceptable cultural resource inventory report for the area[s]; [3] the Utah SHPO concurs with the

National Register eligibility assessments made for any cultural resources recorded within these areas; and, [4] if cultural resources recorded within these areas are determined to be eligibile for nomination to the NRHP, no surface disturbance will occur until: [a] an acceptable mitigation plan conforming with the requirements of the Advisory Council's Guidelines for Making "Adverse Effect" and "No Adverse Effect" Determinations for Archaeological Resources in Accordance with 36 CFR 800 is submitted for review and approval to OSM and the Utah SHPO; and [b] mitigation of adverse effects to cultural resources in this area is complete and the mitigation report has been accepted by the OSM and the Utah SHPO. This stipulation applies to the following areas:

T. 15 S., R. 8 E. - Possible Unit Train, Refuse Disposal, and Building Sites

W1/2 of the SE1/4, Section 12
W1/2 of the SE1/4, Section 11
NE1/4 of the NW1/4 of the NE1/4, S1/2 of the SE1/4 of the SE1/4 of the NE1/4 and SW1/4 of the NE1/4, Section 15
NE1/4 of the SE1/4, Section 13
NW1/4 of the NW1/4 of the NW1/4, Section 16

T. 15 S., R. 9 E. - Possible Refuse Disposal Expansion Site

NW1/4 of the SW1/4, and E1/2 of the SE1/4 of the NE1/4, Section 18
SW1/4 of the NW1/4, Section 17

* The regulatory authority with respect to Federal lands is the Secretary until such time as the State enters into a permanent program cooperative agreement with the Secretary pursuant to Section 523[c] of the SMCRA, at which time the regulatory authority will become the Utah Division of Oil, Gas and Mining.

PMC REPLY: Plateau Mining Company has completed the inventory specified in Item 1 of Stipulation #3 [see Attachment 1]. PMC will forward a copy of the report on said inventory to the OSM for its review, and this action should satisfy Item 2. Attachment #2 is a copy of materials which PMC previously supplied to the OSM and the UDOGM in Supplement #2 of PMC's M.R.P. Item 3 of Stipulation #2 is satisfied by this material in that the Utah SHPO agrees that none of the sites located during the inventory meet the eligibility criteria of the National Register of Historic Places. Item 4 is not applicable.

4] Within 30 days of acceptance of Departmental approval of the Mining and Reclamation Plan, the permittee will submit to the regulatory authority a brief site specific cultural resources eligibility recommendation and evaluation of impacts for each of the sites in the mine plan area. The Utah SHPO has offered to help with these statements, if needed. In conjunction with the Utah SHPO, OSM may request that a sample survey for cultural resource areas be conducted for areas potentially affected by subsidence.

PMC REPLY: PMC has previously provided this information in Supplement #2 of the M.R.P., a copy of which is attached as Attachment #2.

5] Data on the SAR and soluble Na is lacking for all soils in the plan. At a minimum, this data must be provided to the regulatory authority for soils in the refuse disposal area within six months of the permittee's acceptance of Departmental approval of the Mining and Reclamation Plan. The soluble Ca, Mg and Na data used for all SAR calculations should be reported in meq/l rather than ppm.

PMC REPLY: See Attachment #3.

6] Within 60 days of acceptance of Departmental approval of the Mining and Reclamation Plan, the permittee shall submit to the regulatory authority a description of topsoil redistribution methods [related to topsoil depth for each area of disturbance] which are designed to assure successful revegetation.

PMC REPLY: Plateau Mining Company has committed to revegetate all disturbed area. In line with this committment is the assurance that adequate growth medium will be present. At present, the exact amount of top soil required is under study and as technology advances and more data becomes available each area will be delt with on a site specific basis.

7] The permittee will provide a description of measures to be taken to bring pond numbers 1, 3, 5, and 8 into compliance with Section UMC 817.46 [m] regarding embankment slopes or variances obtained from regulatory agencies. For any embankment slope not meeting these design requirements the permittee must demonstrate and obtain certification by a qualified registered professional engineer that the embankments are designed and constructed to insure a minimum 1.5 static safety factor. If this is not provided, then further justification of the embankments; stability or designs for reconstruction to meet the design specifications of UMC 817.46 would be necessary. A response to this condition must be submitted to the regulatory authority within six months of the permittee's acceptance of Departmental approval of the Mining and Reclamation Plan.

PMC REPLY: Plateau Mining Company has requested a variance on ponds 1,3, and 5. The request is under consideration at this time. It is based on the information in Attachment #4. Pond 8 has been deemed unnecessary at this time. However, if it should become necessary in the future, PMC is committed to constructing this pond in compliance with prescribed safety factors.

8] The undetermined extent of possible water resource depletion associated with anticipated mining into the graben/fault zone [to the Northwest] will necessitate a commitment from Plateau Mining Company to monitor quantity, quality, duration and location of ground water as encountered in the underground mining activities at the Star Point Mines [with particular emphasis in the region of the graben/fault zone]. This commitment shall be submitted to the regulatory authority within 30 days of acceptance of Departmental approval of the Mining and Reclamation Plan.

Should substantial adverse impacts to existing water resources and/or any appropriated water rights become imminent, the permittee will be held responsible to provide appropriate mitigation measures to those affected individuals according to the plans outlined in the Mining and Reclamation Plan [pg. 3-77].

PMC REPLY: Plateau Mining Company is presently monitoring all ground waters encounted in the course of underground mining and agrees to continue as committed in our M.R.P. In line with the commitment in the M.R.P., PMC will provide appropriate mitigation measures to any entity which might suffer adverse impact.

9] Within 30 days of acceptance of Departmental approval of the Mining and Reclamation Plan, the permittee shall submit a plan for the control of fires in the coal processing waste disposal pile. In the event that routine monitoring and inspection reveals ignition to be imminent [hot spots], material in that area will be excavated, removed to a predesignated place and spread out to extinguish and prevent further heating.

PMC REPLY: See Attachment #5

10](a) Within 12 months, or at least 60 days before planting [whichever comes first], the permittee will submit to the regulatory authority for approval, the seed mixtures which will be used for temporary topsoil stockpile stabilization and permanent revegetation. Inclusion of introduced species must be justified as per UMC 817.112.

PMC REPLY: PMC has adhered to this practice in the past and will continue to do so in the future. However, PMC does feel it is imperative that a consensus be reached between all regulatory agencies regarding an acceptable seed mixture for each vegetation community.

All existing topsoil stockpiles on the property were seeded in the Fall of 1981, and that same approved seed mixture will be used in the event additional seeding is considered necessary.

10](b) Within 12 months, or at least 60 days before planting [whichever comes first], the permittee will submit to the regulatory authority for approval, a comprehensive plan describing the density and composition of woody plant species and the locations [i.e., slope, aspect] to be planted on disturbed areas. If the applicant wishes to propose alternative standard[s] to the reference area woody plant density levels, this should also be provided. Where the post-mining land use is to be wildlife habitat, the creation of edge effect for wildlife should be addressed, including shrub and tree groupings.

PMC REPLY: Again, PMC has followed the procedure outlined above and agrees to adhere to it in the future. All disturbed areas have been planted with an approved seed mixture as outlined in UMC 817.112, and the effort was coordinated with the U.D.W.R. [Mr. Larry Dalton] with all consideration taken into account. If additional work in this area appears necessary the same approved seed mixture will be utilized.

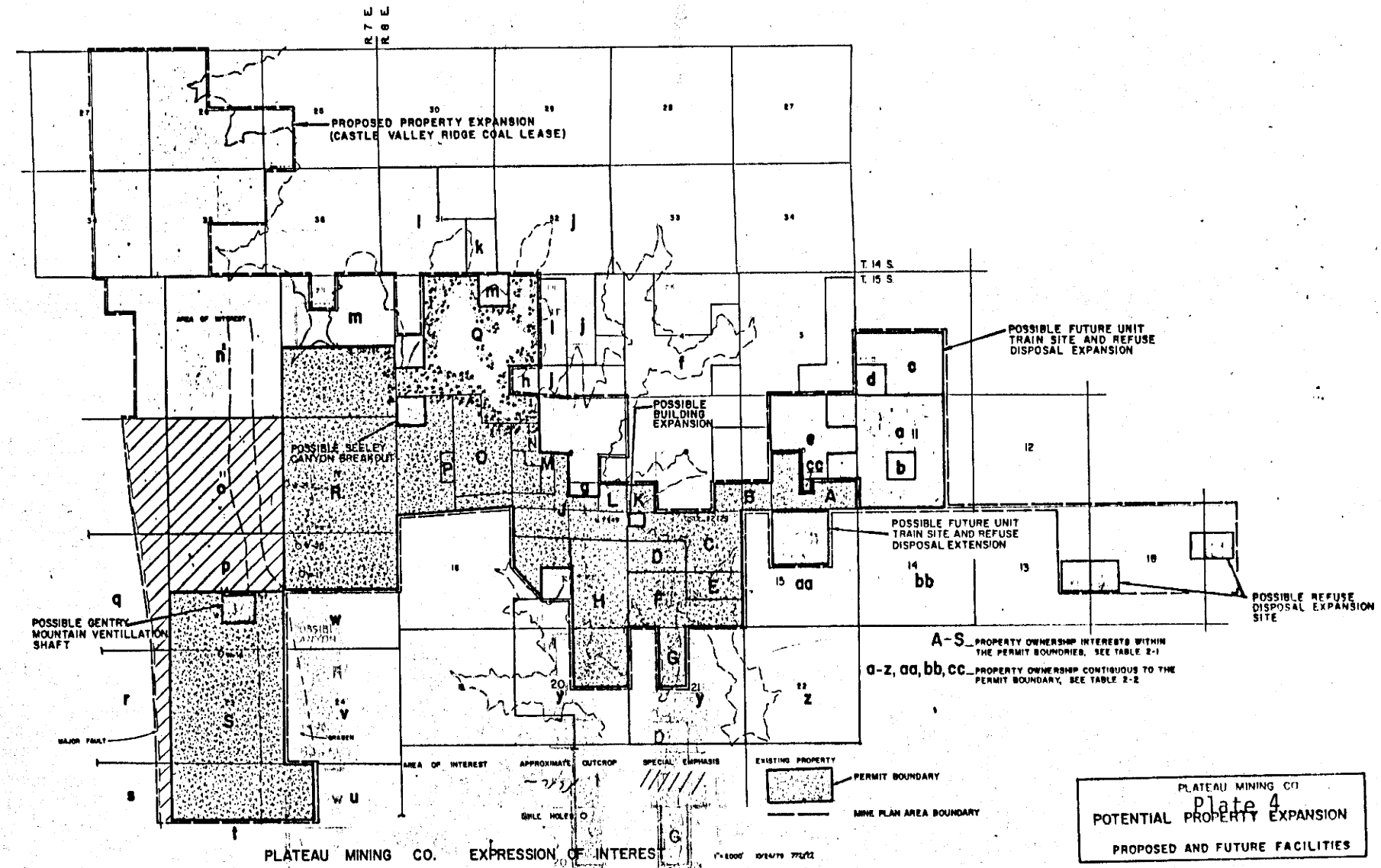
10](c) The permittee will submit a copy of vegetation monitoring data collected on revegetated areas to the regulatory authority by December 1st of each year.

PMC REPLY: PMC agrees to the above and has complied in the past [see reply to refuse pile expansion 1981].

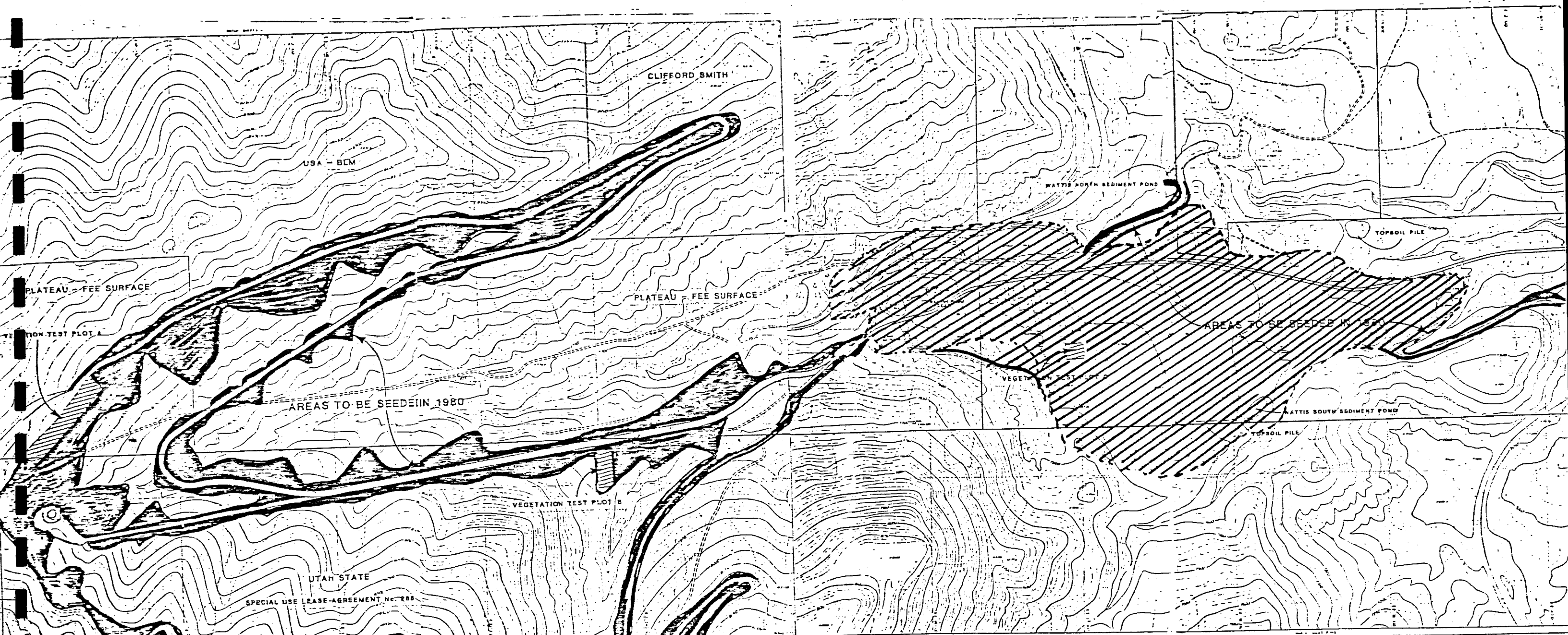
11] If lifestock grazing is to occur on revegetated areas or corresponding reference areas during the liability period, the permittee will submit a grazing management plan to the regulatory authority for approval, one year prior to initiation of grazing.

With regard to the final reclamation of the Lion Deck Portal Access Road, the regulatory authority requires total reclamation at termination of operations. The permittee may present a post-mining land-use for continued use of the road at the termination of mining operations encompassing all applicable landowner requests, consents and responsibilities which may be approvable by the regulatory authority at that time.

PMC REPLY: Plateau Mining Company agrees to follow the prescribed methods outlined in Stipulation #11.



PLATEAU MINING CO
Plate 4
POTENTIAL PROPERTY EXPANSION
PROPOSED AND FUTURE FACILITIES



Areas of disturbance

Seeded areas of disturbance

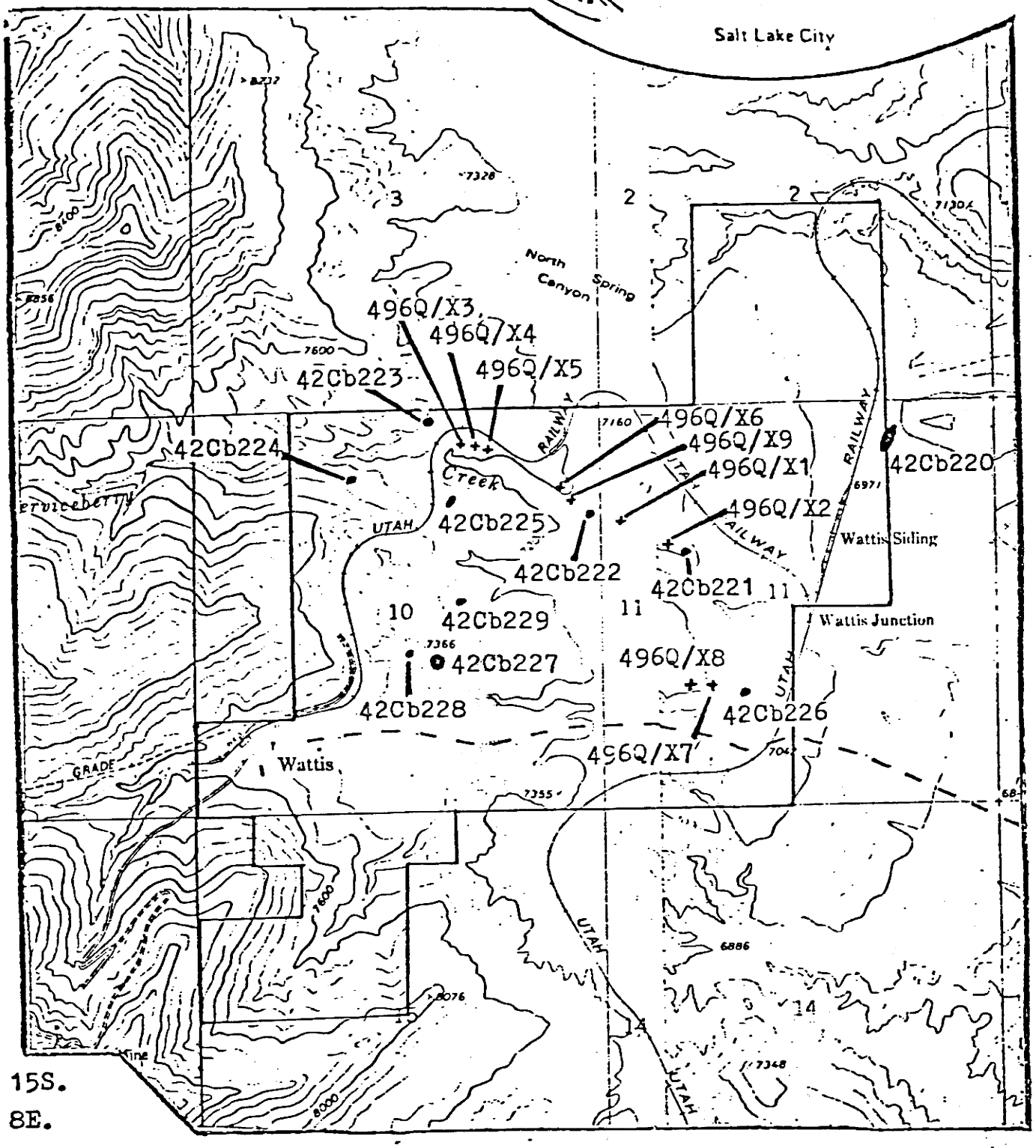
ATTACHMENT #1

NO. 3

SITE DESCRIPTIONS

ATTACHMENT #1

ARCHEOLOGICAL-ENVIRONMENTAL RESEARCH CORPORATION



T. 15S.

R. 8E.

Meridian: Salt Lake B. & M.

Quad: Wattis and Pinnacle Peak, UT 7.5 Minute USGS

Project: PMC-80-1

Series: East Central Utah

Date: 11/25/80

Figure 3

Cultural Resource Locations in the Wattis Locality of Carbon County, Utah

Legend:

Survey Boundary

Archeological Site

Isolated Artifact

0 .5 1 Mi

.5 0 .5 1 Km

Bureau of Land Management
Division of State History
University of Utah Archeological Center

2. County Carbon
3. Temp. No. 496Q/1

4. Class: ___ Prehistoric x Historic ___ Paleontologic
5. Cultural Site Type (interpreted function): Railroad camp
6. Paleontological Site Type: __ Invertebrate; __ Vertebrate; __ Flora
7. Elevation (I/11-15) 6880 ft. X .3048= 2097.02 m.
elevation source: topographic map
8. UTM Grid: (I/16-30) zone 12 ; 500900 mE.; 4376600 mN.
9. (II/I-16) NE of NW of NE of Section 11 T. 15S., R. 8E.
10. Map Reference: Pinnacle Peak, Utah USGS Series: 7.5' Date: 1972
11. Aerial Photo Data: NA
12. Site Location: The site is on the west-facing foot of a hill (on erosional remnant) on an east-facing bench.

13. Land Owner (II/17-18): BLM
BLM District/Forest (II/19): Moab
14. Site Name/Previous Designations: NA
15. Description of Site: The site consists of purple and green glass, solder cans, milled boards, nails, and crockery along with many tobacco cans. No structure was found, but undoubtedly some type of structure once was present. There are some concentrated areas of garbage, and the site is located along a dirt road and some railroad tracks which pre-date 1914. Among the artifacts found was the type of individual serving coffee pot used in railroad dining cars.

16. Artifacts: Artifacts should be described/drawn on a continuation sheet and their locations plotted on the site map.

CLASS	QUANTITY
Debitage (II/30)	1 flake
Bifaces (III/1-9)	
Scrapers (III/1-9)	
Utilized Flakes	

CLASS		TYPE	QUANTITY
Ceramics	(III/10-21)	crockery	
Proj Pnt	(III/1-9)		
Gnd Stn	(II/22-29)		
Glass	(II/22-29)	purple & green	
Metal	(II/22-29)		
Nails	(II/22-29)		
Cans	(II/22-29)	soldered	
Wood	(II/22-29)	short, milled	box-boar
Other	(II/22-29)		

Description:

17. Non-Structural Features: (describe and locate on site map)(III/22-27

_hearth/firepit(HE)	_rubble mound(RM)	_earthen mound(EM)	_trail/road(TR)
X midden(MD)	_stone circle(SC)	_burial(BU)	X 2 grade(RG)
_depression(DE)	_rock alignment(RA)	_pictograph(PI)	_tram way/road(TW)
_water control(WC)	_mine tailings(MT)	_petroglyph(PE)	_other(OT)

Description: scattered trash

ATTACHMENT #1

(LASS				
Single rm			Tower	
Multiple rm			Cairn	
Granary			Corral	
Cist			Dugout	
Pithouse			Kiln	
Kiva			Monument	
Well			Mine	

Description: Depression probably with built-up wall; possible pond

19. Cultural Affiliation (IV/7-14) Euro-American

How Determined? trash

20. Site Dimensions: 150 m.X 250 m; Area(IV/17-21) 37500 sq m

21. Were surface artifacts collected? x Yes ___ No; (IV/22) If yes, attach a continuation sheet describing sampling method used: random

22. Estimated depth of fill (IV/23): unknown

Subsurface test? ___ Yes; x No (Include location of test on site map

Description: NA

23. Site Condition (IV/25): ___ Excellent; ___ Good; x Fair; ___ Poor

Agent of Impact: erosion

24. Nat.Register Potential(V/1): x Significant(C); ___ Non-Significant(D)

Justification: CRRS:S-2; no structure evident-possibly tents used but the site is extensive and early historic.

25. Research Potential: low

26. Recommended Mitigation: Avoidance or controlled pickup

27. Direction/Distance to Permanent Water (V/5-10): 180° / 800 m

Type/Name of Water Source (V/11): Serviceberry Creek?

Distance to nearest other Water Source (V/2-4): 900 m.

Type of other Water Source: intermittent creek

Distance to Cultivatable Soil (V/12-14): 100 m.

28. Topographic Location (check one under each heading) (V/15-18)

PRIMARY LANDFORM
- _ mountain spine(A)
- _ hill/butte(B)
- _ tableland/mesa(C)
- _ ridge(D)
- _ valley(E)
- X plain(F)
- _ canyon(G)

POSITION ON LANDFORM
- _ top/crest/peak(A)
- X edge(B)
- _ slope(C)
- _ toe/foot/bottom(D)
- _ saddle/pass(E)
- _ bench/ledge(F)
- _ rimrock(G)
- _ interior(H)

DEPOSITIONAL ENVIRONMENT
- _ fan(A)
- _ talus(B)
- _ dune(C)
- _ stream terrace(D)
- _ playa(E)
- shore feature
  - _ extinct lake(F)
  - _ extant lake(G)
- _ alluvial plain(H)
- X colluvium(I)
- _ moraine(J)
- _ flood plain(K)
- _ marsh(L)
- _ landslide/slump(M)
- _ delta(N)
- _ island(O)
- _ cliff(P)
- _ outcrop(Q)
- _ stream bed(R)

SECONDARY POSITION
- _ top/crest/ridge(A)
- _ edge(B)
- _ slope(C)
- X toe/foot(D)
- _ cutbank(E)
- _ detached monolith(F)
- _ interior(G)
- _ step(H)
- _ riser(I)
- _ port.geo.feature(J)
- _ spring mound/bog(K)
- _ cave(L)
- _ alcove/shelter(M)
- _ patterned ground(N)

ATTACHMENT #1

Description: The site is located off the toe of a small hill which rises out of the valley floor, and is on both sides of

30. Vegetation Community

_ [illegible] CLASSLAND(AA)
_ [illegible] FIR(AB)
_ [illegible]mbols(AA)
_ [illegible]ite fir-spruce(AB)
_ [illegible] DOUGLAS FIR(AC)
_ [illegible]mber pine(CA)
_ douglas fir(CB)
_ [illegible]dgepole pine(CC)
_ [illegible]istocene pine(CD)
_ [illegible]pen(CE)
_ streamside(CD)
_ [illegible]adow grassland(CE)

_ YELLOW PINE-OAK(DA)
_ ponderosa pine(DA)
_ oakbrush(DB)
_ mountain brush(DC)
_ maple(DD)
_ streamside(DE)

_ FIELDS/PRAIRIE(EA)
_ grasslands(EA)
X pinyon-juniper(EB)
_ streamside(EC)

_ COLD DESERT SCRUB(FA)
X sagebrush(FA)
_ small sagebrush(FB)
_ little rabbitbrush(FC)
_ shadscale(FD)
_ hornebrush(FE)
_ winter-fat(FF)
_ hop-sage/blkbrsh(FG)
_ bud sagebrush(FH)
_ mat saltbrush(FI)
_ gray molly(FJ)
_ streamside(FK)

_ HOT DESERT SCRUB(GA)
_ greasewood(GA)
_ greasewood-shadscl(GB)
_ seepweed(GC)
_ pickleweed/samphire(GD)
_ saltgrass(GE)
_ alkali sacaton(GF)
_ rabbitbrush(GG)

_ WARM DESERT SCRUB(H
_ desert saltbrush(HA
_ creosote bush(HB)
_ creosote/bursage(HC
_ joshua tree(HD)
_ MIXED COMMUNITY(HA)

_ ALKALI FLATS/MUD FLATS/DRY LAKE/ WASTELAND(IA)

_ CULTIVATED LAND(JA)

Description: The site is on the edge of pinyon-juniper (uphill from site) and sage with scattered pinyon-juniper (downhill).

31. Next nearest plant association/distance: unknown

32. Photograph Numbers (V/26): 496Q-1 (1)

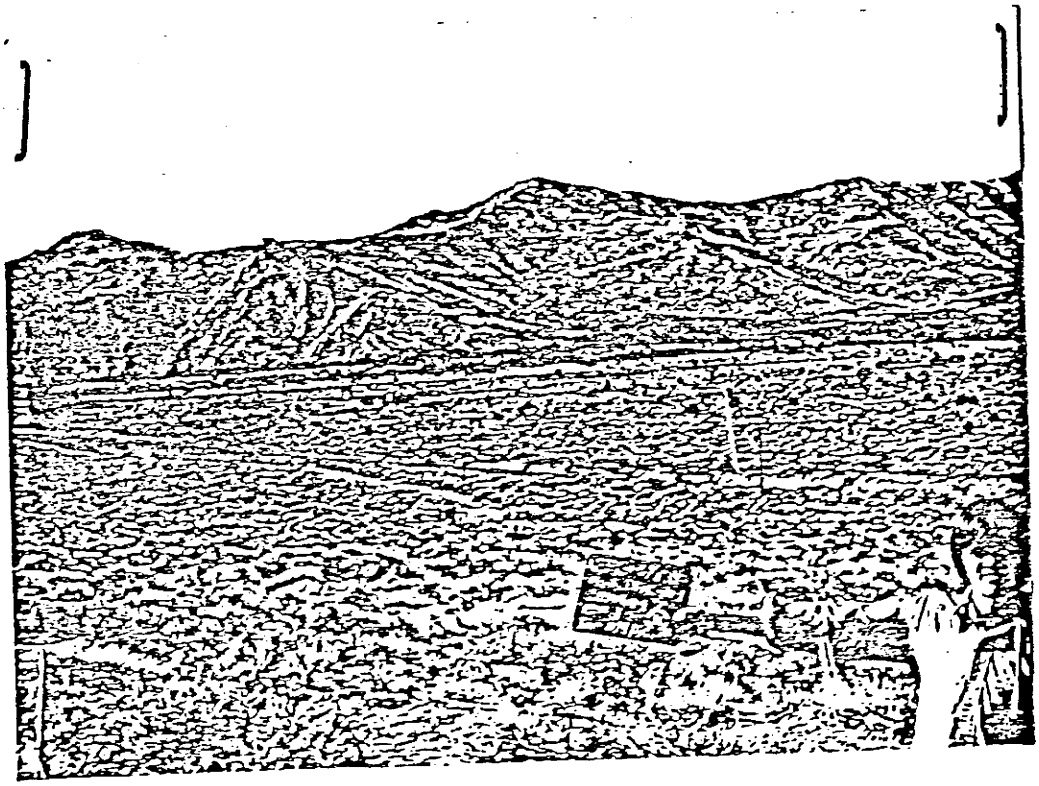
33. Recorded by: W. W. Carpenter

Survey Org. (V/27-28): AERC Date: 11/4/80

Assisting Crew Members: Michael Sloan, Mark Melendez, Robert Stevenson

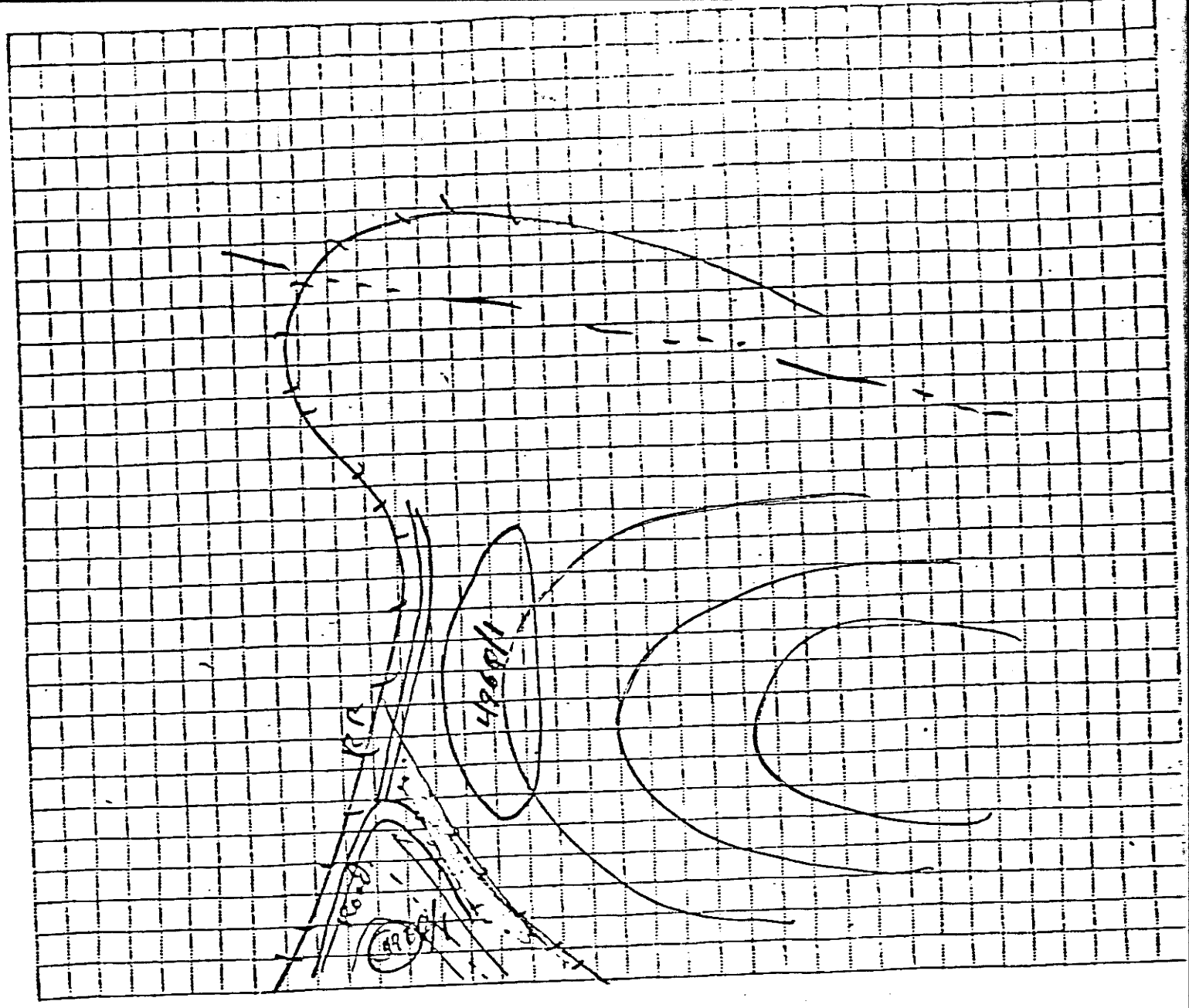
34. Sponsoring Agency: Plateau Mining Company (PMC-80-1)

Contract No. NA



UT8100-1 (8/80)

ATTACHMENT #1



35. Encoding Form: (all entries are right justified)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
I	4	2	C	b	2	2	0				6	8	8	0		1	2	5	0	0	9	0	0	4	3	7	6	8	0	0	
II	N	E	N	W	N	E	1	1	1	5	5		8	E			L	M	6	B	B	H	T	6	2	C	N			Z	
III	~~F~~	A		~~A~~	~~A~~	~~A~~				A	A	A										M	D	U	C	R	G	D			
IV							E	A							G		3	7	5	0	0	B	Z	C	C	E	R				
V	C	0	0	0	1	8	0	8		B	1				F	B	I	D	4		2	7	0	F	A	B	A	E			
VI																															

Form must be accompanied by a site map; photocopy of U.S.G.S. topo map with T., R., scale, and quad name; photographs of the site; and artifact sketches (if applicable).

Bureau of Land Management
Division of State History
University of Utah Archeological Center

2. County Carbon
3. Temp. No. 496Q/2

4. Class: x Prehistoric ___ Historic ___ Paleontologic
5. Cultural Site Type (interpreted function): Lithic scatter, hunting
6. Paleontological Site Type: __ Invertebrate; __ Vertebrate; __ Flora
7. Elevation (I/11-15) 7080 ft. X .3048= 2157.98 m.
elevation source: topographic map
8. UTM Grid: (I/16-30) zone 12 ; 500150 mE.; 4376125 mN.
9. (II/I-16) NE of SE of NW of Section 11 T. 15S., R. 8E.
10. Map Reference: Pinnacle Peak, UT USGS Series: 7.5' Date: 1972
11. Aerial Photo Data: NA
12. Site Location: The site is on the north side of a deep canyon (100 ft.) with a large plain to the north sloping down to the north and east.

13. Land Owner (II/17-18): BLM
BLM District/Forest (II/19): Moab
14. Site Name/Previous Designations: NA
15. Description of Site: The site is a small lithic scatter 20 to 25 meters across. The entire north edge of Serviceberry Creek (the top of the canyon) appears, by the flake distribution and type, to have been a hunting spot with the hunters waiting 15-40 ft. back fro the lip for the deer or other game to come over the lip. This is still a preferred spot with numerous modern cartridge casings along the edge.

16. Artifacts: Artifacts should be described/drawn on a continuation sheet and their locations plotted on the site map.

CLASS	QUANTITY
Debitage (II/30)	50 & up
Bifaces (III/1-9)	
Scrapers (III/1-9)	
Utilized Flakes	

CLASS	TYPE	QUANTITY
Ceramics (III/10-21)		
Proj Pnt (III/1-9)		1
Gnd Stn (II/22-29)		
Glass (II/22-29)		
Metal (II/22-29)		
Nails (II/22-29)		
Cans (II/22-29)		
Wood (II/22-29)		
Other (II/22-29)		

Description: Dart point, rose pink chert

17. Non-Structural Features: (describe and locate on site map)(III/22-27

_hearth/firepit(HZ) _rubble mound(RM) _earthen mound(EM) _trail/road(TR)
_midden(MD) _stone circle(SC) _burial(BU) _RR grade(RG)
_depression(DE) _rock alignment(RA) _pictograph(PI) _tram way/road(TW)
_water control(WC) _mine tailings(MT) _petroglyph(PE) _other(OT)

Description: NA

ATTACHMENT #1

Site No. 42Cb21 (4960)

Multiple rm			Cairn		
Granary			Corral		
Cist			Dugout		
Pithouse			Kiln		
Kiva			Monument		
Well			Mine		

Description: NA

19. Cultural Affiliation (IV/7-14) Archaic

How Determined? point

20. Site Dimensions: 20 m. X 20 m; Area (IV/17-21) 400 sq m

21. Were surface artifacts collected? x Yes ___ No; (IV/22) If yes, attach a continuation sheet describing sampling method used: random

22. Estimated depth of fill (IV/23): 0

Subsurface test? ___ Yes; x No (Include location of test on site ma

Description:

23. Site Condition (IV/25): ___ Excellent; ___ Good; x Fair; ___ Poor

Agent of Impact: erosion

24. Nat. Register Potential (V/1): x Significant (C); ___ Non-Significant (D)

Justification: possible Archaic point located, CRRS:S-2

25. Research Potential: Good

26. Recommended Mitigation: Avoidance or pickup

27. Direction/Distance to Permanent Water (V/5-10): 180° / 50 m

Type/Name of Water Source (V/11): Service berry Creek

Distance to nearest other Water Source (V/2-4): 1 km.

Type of other Water Source: intermittent creek

Distance to Cultivatable Soil (V/12-14): 10 meters

28. Topographic Location (check one under each heading) (V/15-18)

PRIMARY LANDFORM
- _ mountain spine (A)
- _ hill/butte (B)
- _ tableland/mesa (C)
- _ ridge (D)
- _ valley (E)
- X plain (F)
- _ canyon (G)

POSITION ON LANDFORM
- _ top/crest/peak (A)
- X edge (B)
- _ slope (C)
- _ toe/foot/bottom (D)
- _ saddle/pass (E)
- _ bench/ledge (F)
- _ rimrock (G)
- _ interior (H)

DEPOSITIONAL ENVIRONMENT
- _ fan (A)
- _ talus (B)
- _ dune (C)
- _ stream terrace (D)
- _ playa (E)
- shore feature
  - _ extinct lake (F)
  - _ extant lake (G)
  - _ alluvial plain (H)
- X colluvium (I)
- _ moraine (J)
- _ flood plain (K)
- _ marsh (L)
- _ landslide/slump (M)
- _ delta (N)
- _ island (O)
- _ cliff (P)
- _ outcrop (Q)
- _ stream bed (R)

SECONDARY POSITION
- _ top/crest/ridge (A)
- X edge (B)
- _ slope (C)
- _ toe/foot (D)
- _ cutbank (E)
- _ detached monolith (F)
- _ interior (G)
- _ step (H)
- _ riser (I)
- _ port. geo. feature (J)
- _ spring mound/bog (K)
- _ cave (L)
- _ alcove/shelter (M)
- _ patterned ground (N)

Description: The site is on the southwest edge of a north down-sloping plain with a 100 ft. deep canyon on the south edge of the site.

ATTACHMENT #1

UT8100-1 (8/80)

30. Vegetation COMMUNITY and association (V/24-25)

_PINE GRASSLAND(AA)

_SPRUCE-FIR(BZ)
_[illegible](BA)
_white fir-spruce(BB)
_SPRUCE DOUGLAS FIR(CZ)
_limber pine(CA)
_douglas fir(CB)
_lodgepole pine(CC)
_bristlecone pine(CD)
_aspen(CZ)
_streamside(CD)
_meadow grassland(CG)

_YELLOW PINE-OAK(DZ)
_ponderosa pine(DA)
_oakbrush(DB)
_mountain brush(DC)
_maple(DD)
_streamside(DE)

_PLAINS/PRAIRIE(EZ)
_grasslands(EA)
X pinyon-juniper(EB)
_streamside(EC)

_COLD DESERT SHRUB(FZ)
_sagebrush(FA)
_small sagebrush(FB)
_little rabbitbrush(FC)
_shadscale(FD)
_horsebrush(FE)
_winter-fat(FF)
_hop-sage/blkbrsh(FG)
_bud sagebrush(FH)
_mat saltbrush(FI)
_gray molly(FJ)
_streamside(FK)

_SALT DESERT SHRUB(GZ)
_greasewood(GA)
_greasewood-shadscl(GB)
_seepweed(GC)
_pickleweed/samphire(GD)
_saltgrass(GE)
_alkali sacaton(GF)
_rabbitbrush(GG)

_WARM DESERT SHRUB(H[illegible]
_desert saltbrush(H[illegible]
_creosote bush(HB)
_creosote/bursage(HC
_joshua tree(HD)
_MARSH COMMUNITY(IA)

_ALKALI FLATS/MUD FLATS/DRY LAKE/ WASTELAND(XZ)

_CULTIVATED LAND(ZZ)

Description: pinyon, juniper, sage, Indian rice grass

31. Next nearest plant association/distance: unknown
32. Photograph Numbers (V/26): 4960-1 (2)
33. Recorded by: W. W. Carpenter
Survey Org. (V/27-28): AERC Date: 11/5/80
Assisting Crew Members: Michael Sloan, Mark Melendez, Robert Stevenson

34. Sponsoring Agency: Plateau Mining Company (PMC-80-1)
Contract No. NA

42Cb221

ATTACHMENT #1

UT8100-1 (8/80)

Bureau of Land Management
Division of State History
University of Utah Archeological Center

2. County Carbon
3. Temp. No. 496Q/3

4. Class: x Prehistoric ___ Historic ___ Paleontologic
5. Cultural Site Type (interpreted function): Lithic scatter, hunting
6. Paleontological Site Type: __ Invertebrate; __ Vertebrate; __ Flora
7. Elevation (I/11-15) 7160 ft. X .3048= 2182 m.
elevation source: topographic map
8. UTM Grid: (I/16-30) zone 12 ; 499700 mE.; 4376300 mN.
9. (II/I-16) NE of SE of NE of Section 10 T. 15S., R. 8E.
10. Map Reference: Wattis, Utah USGS Series: 7.5' Date: 1979
11. Aerial Photo Data: NA
12. Site Location: The site is on the north lip of a deep, steep canyon (Serviceberry Creek) on a NE-sloping bench.

13. Land Owner (II/17-18): Private
BLM District/Forest (II/19): NA
14. Site Name/Previous Designations: NA
15. Description of Site: The site is a sparse lithic scatter with tertiary flakes of chert and quartzite. The entire north lip of the canyon of Service berry Creek appears, by the type and distribution of flakes, to have been a preferred hunting spot, with the hunters waiting 15-40 ft. back from the lip for the game to come up out of the canyon. Many modern cartridge casings are scattered along the same lip.

16. Artifacts: Artifacts should be described/drawn on a continuation sheet and their locations plotted on the site map.

CLASS	QUANTITY
Debitage (II/30)	30+
Bifaces (III/1-9)	
Scrapers (III/1-9)	
Utilized Flakes	

CLASS	TYPE	QUANTITY
Ceramics (III/10-21)		
Proj Pnt (III/1-9)		
Gnd Stn (II/22-29)		
Glass (II/22-29)		
Metal (II/22-29)		
Nails (II/22-29)		
Cans (II/22-29)		
Wood (II/22-29)		
Other (II/22-29)		

Description: Clear, red, pink chert; green and white quartzite site

17. Non-Structural Features: (describe and locate on site map)(III/22-27)

_hearth/firepit(HE) _rubble mound(RM) _earthen mound(EM) _trail/road(TR)
_midden(MD) _stone circle(SC) _burial(BU) _RR grade(RG)
_depression(DE) _rock alignment(RA) _pictograph(PI) _tram way/road(TW)
_water control(WC) _mine tailings(MT) _petroglyph(PE) _other(OT)

Description: NA

ATTACHMENT #1

Single rm			Tower		
Multiple rm			Cairn		
Granary			Corral		
Cist			Dugout		
Pithouse			Kiln		
Kiva			Monument		
Well			Mine		

Description: 0

19. Cultural Affiliation (IV/7-14) unknown

How Determined?

20. Site Dimensions: 5 m.X 15 m; Area(IV/17-21) 75 sq m

21. Were surface artifacts collected? ___Yes x No; (IV/22) If yes, attach a continuation sheet describing sampling method used.

22. Estimated depth of fill (IV/23): unknown

Subsurface test? ___Yes; x No (Include location of test on site map

Description:

23. Site Condition (IV/25): ___Excellent; ___Good; x Fair; ___Poor

Agent of Impact: erosion

24. Nat.Register Potential(V/1): ___Significant(C); x Non-Significant(D)

Justification: CRRS:S-3; no depth, no structures, and no diagnostics present.

25. Research Potential: poor

26. Recommended Mitigation: avoidance or pickup

27. Direction/Distance to Permanent Water (V/5-10): 180° / 50 m

Type/Name of Water Source (V/11): Serviceberry Creek

Distance to nearest other Water Source (V/2-4): 1 km.

Type of other Water Source: intermittent stream

Distance to Cultivatable Soil (V/12-14): 5 meters

28. Topographic Location (check one under each heading) (V/15-18)

PRIMARY LANDFORM	POSITION ON LANDFORM	DEPOSITIONAL ENVIRONMENT		SECONDARY POSITION
_mountain spine(A)	_top/crest/peak(A)	_fan(A)	_marsh(L)	_top/crest/ridge(A)
_hill/butte(B)	X_edge(B)	_talus(B)	_landslide/slump(M)	_edge(B)
_tableland/mesa(C)	_slope(C)	_dune(C)	_delta(N)	_slope(C)
_ridge(D)	_toe/foot/bottom(D)	_stream terrace(D)	_island(O)	_toe/foot(D)
_valley(E)	_saddle/pass(E)	_playa(E)	_cliff(P)	_cutbank(E)
X_plain(F)	_bench/ledge(F)	shore feature	_outcrop(Q)	_detached monolith(F)
_canyon(G)	_rimrock(G)	_extinct lake(F)	_stream bed(R)	_interior(G)
	_interior(H)	_extant lake(G)		_step(H)
		_alluvial plain(H)		_riser(I)
		X_colluvium(I)		_port.geo.feature(J)
		_moraine(J)		_spring mound/bog(K)
		_flood plain(K)		_cave(L)
				_alcove/shelter(M)
				_patterned ground(N)

Description: The site is on a northeast down-sloping plain with a deep canyon (100-125 ft.) at the south edge.

30. Vegetation COMMUNITY and association (V/24-25).

_[illegible] (AA)
_[illegible] (BA)
_[illegible] spruce(BB)
_DOUGLAS FIR(BC)
_[illegible] pine(CA)
_[illegible]glas fir(CB)
_[illegible]drepole pine(CC)
_[illegible]ristlecone pine(CD)
_aspen(CE)
_streamside(CF)
_[illegible]dow grassland(CG)

_YELLOW PINE-OAK(DA)
_ponderosa pine(DA)
_oakbrush(DB)
_mountain brush(DC)
_maple(DD)
_streamside(DE)

_PLAINS/PRAIRIE(EA)
_grasslands(EA)
X pinyon-juniper(EB)
_streamside(EC)

_COLD DESERT SCRUB(FA)
_sagebrush(FA)
_small sagebrush(FB)
_little rabbitbrush(FC)
_shadscale(FD)
_horsebrush(FE)
_winter-fat(FF)
_hopsage/blkbrsh(FG)
_bud sagebrush(FH)
_mat saltbrush(FI)
_gray molly(FJ)
_streamside(FK)

_HOT DESERT SCRUB(GA)
_greasewood(GA)
_greasewood-shadscl(GB)
_seepweed(GC)
_pickleweed/samphire(GD)
_saltgrass(GE)
_alkali sacaton(GF)
_rabbitbrush(GG)

_MAIN DESERT SCRUB(H
_desert saltbrush(HA
_creosote bush(HB)
_creosote/burrsage(HC
_joshua tree(HD)
_MARSH COMMUNITY(IA)

_ALPINE FLATS/MEDO
FLATS/DRY LAKE/
WASTELAND(JA)

_CULTIVATED LAND(JB)

Description: pinyon, juniper, sage, Indian rice grass

31. Next nearest plant association/distance: unknown

32. Photograph Numbers (V/26): 496Q-1 (3)

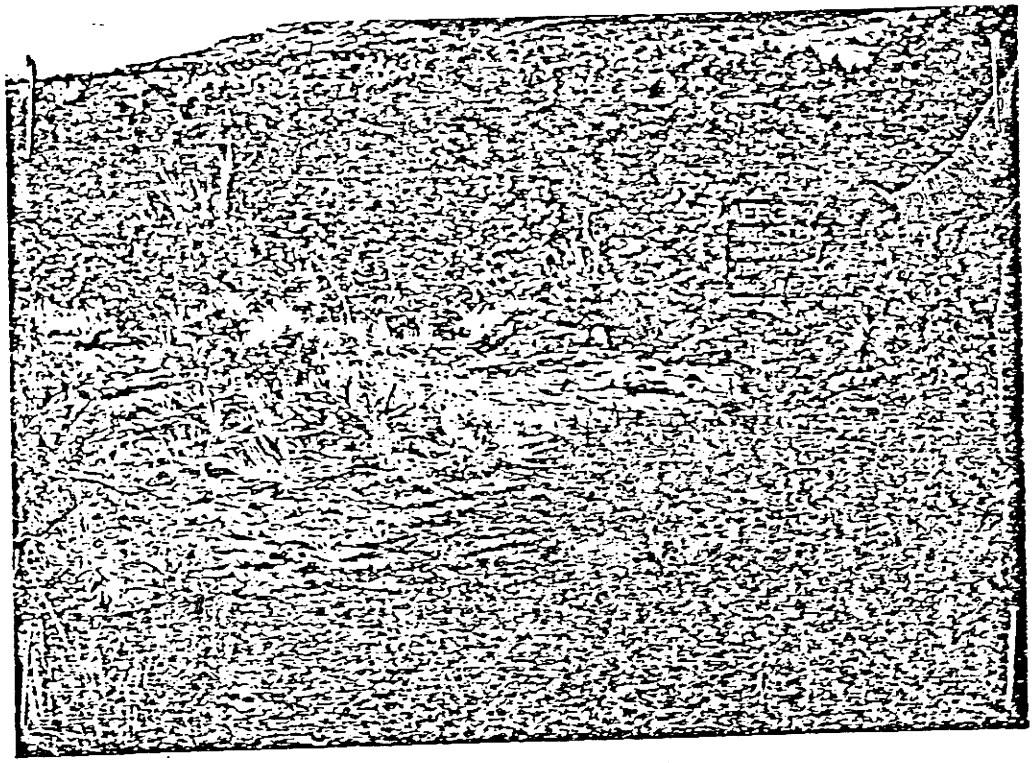
33. Recorded by: W. W. Carpenter

Survey Org. (V/27-28): AERC Date: 11/5/80

Assisting Crew Members: Micahel Sloan, Mark Melendez, Robert Stevenson

34. Sponsoring Agency: Plateau Mining Company (PMC-80-1)

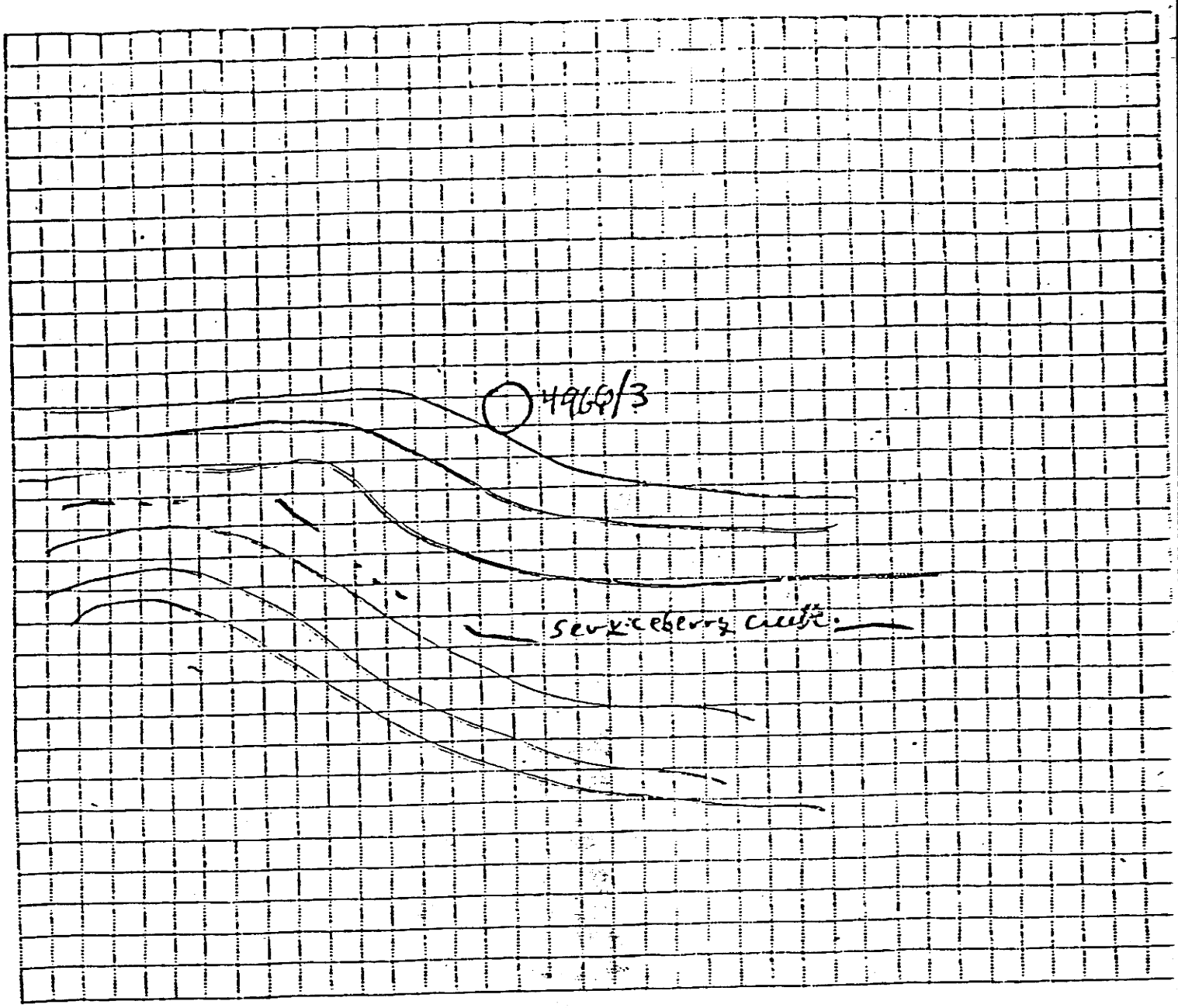
Contract No. NA



UT8100-1 (8/80)

ATTACHMENT #1

42CO222



35. Encoding Form: (all entries are right justified)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
I	4	2	C	6	2	2	2				7	1	6	0		1	2	4	9	9	7	0	0	4	3	7	6	3	0	0	
II	N	E	S	E	N	E	1	D	1	5		S	8	E			P	R	6	B	B	L	S							2	
III		A									A	A	A																		
IV							2	2							2		7	5				A	Z	C	C	E	R				
V	D	9	9	9	1	8	0	D			B				F	B	1	2	2		4	5		E	B	B	A	E			
VI																															

Form must be accompanied by a site map; photocopy of U.S.G.S. topo map with T., R., scale, and quad name; photographs of the site; and artifact sketches (if applicable).

Site No. 42Cb223 (496Q/4)

Single rm			Tower		
Multiple rm			Cairn		
Granary			Corral	wood	1
Cist			Dugout		
Pithouse			Kiln		
Kiva			Monument		
Well			Mine		

Description: The corral uses existing trees as some of the posts. The corral is about 30 feet across and 3-4 feet high.

19. Cultural Affiliation (IV/7-14) Euro-American

How Determined? garbage

20. Site Dimensions: 25 m.X 25 m; Area(IV/17-21) 625 sq m

21. Were surface artifacts collected? ___Yes x No; (IV/22) If yes, attach a continuation sheet describing sampling method used.

22. Estimated depth of fill (IV/23): unknown

Subsurface test? ___Yes; x No (Include location of test on site ma

Description: ___

23. Site Condition (IV/25): ___Excellent; ___Good; x Fair; ___Poor

Agent of Impact: erosion

24. Nat.Register Potential(V/1): ___Significant(C); x Non-Significant(D)

Justification: CRRS:S-2; no apparent depth but there is a structure present.

25. Research Potential: low

26. Recommended Mitigation: avoidance

27. Direction/Distance to Permanent Water (V/5-10): 180° / 150 m

Type/Name of Water Source (V/11): Serviceberry Creek, intermitten

Distance to nearest other Water Source (V/2-4): 500 meters

Type of other Water Source: intermittent creek

Distance to Cultivatable Soil (V/12-14): 100 meters.

28. Topographic Location (check one under each heading) (V/15-18)

PRIMARY LANDFORM	POSITION ON LANDFORM	DEPOSITIONAL ENVIRONMENT		SECONDARY POSITION
_mountain spine(A)	_top/crest/peak(A)	_fan(A)	_marsh(L)	_top/crest/ridge(A)
_hill/butte(B)	X_edge(B)	_talus(B)	_landslide/slump(M)	_edge(B)
_tableland/mesa(C)	_slope(C)	_dune(C)	_delta(N)	_slope(C)
_ridge(D)	_toe/foot/bottom(D)	_stream terrace(D)	_island(O)	_toe/foot(D)
_valley(E)	_saddle/pass(E)	_playa(E)	_cliff(P)	_cutbank(E)
X_plain(F)	_bench/ledge(F)	shore feature	_cuttrop(Q)	_detached monolith(F)
_canyon(G)	_rimrock(G)	_extinct lake(F)	_stream bed(R)	_interior(G)
	_interior(H)	_extant lake(G)		_step(H)
		_alluvial plain(H)		_riser(I)
		X_colluvium(I)		_port.geo.feature(J)
		_moraine(J)		_spring mound/bog(K)
		_flood plain(K)		_cave(L)
				_alcove/shelter(M)
				_patterned ground(N)

Description: The site is located where the upper canyon of Serviceberry Creek opens out into a plain.

30. Vegetation COMMUNITY and association (V/24-25):

[illegible] GRASSLAND(AA)
_SPRUCE FIR(BB)
_[illegible]bolx(BA)
_white fir-spruce(BB)
_MIXED DOUGLAS FIR(BC)
_limber pine(CA)
_douglas fir(CB)
_lodgepole pine(CC)
_bristlecone pine(CD)
_aspen(CE)
_streamside(CF)
_meadow grassland(CG)

_YELLOW PINE-OAK(DA)
_ponderosa pine(DA)
_oakbrush(DB)
_mountain brush(DC)
_maple(DD)
_streamside(DE)

_PLAINS/PRAIRIE(EA)
_grasslands(EA)
X_pinyon-juniper(EB)
_streamside(EC)

_COLD DESERT SCRUB(FA)
_sagebrush(FA)
_small sagebrush(FB)
_little rabbitbrush(FC)
_shadscale(FD)
_horsebrush(FE)
_winter-fat(FF)
_hop-sage/blkbrush(FG)
_bud sagebrush(FH)
_mat saltbrush(FI)
_gray molly(FJ)
_streamside(FK)

_SALT DESERT SCRUB(GA)
_greasewood(GA)
_greasewood-shadscal(GB)
_seepweed(GC)
_pickleweed/samphire(GD)
_saltgrass(GE)
_alkali sacaton(GF)
_rabbitbrush(GG)

_WARM DESERT SCRUB(H
_desert saltbrush(H
_creosote bush(HB)
_creosote/burrsage(HC
_joshua tree(HD)
_MARSH COMMUNITY(IA)

_ALPINE FLATS/MUD FLATS/DRY LAKE/ WASTELAND(JA)

_CULTIVATED LAND(KA)

Description: pinyon, juniper, Indian rice grass, service berry, rabbit brush, sage

31. Next nearest plant association/distance: unknown

32. Photograph Numbers (V/26): 4960-1 (4)

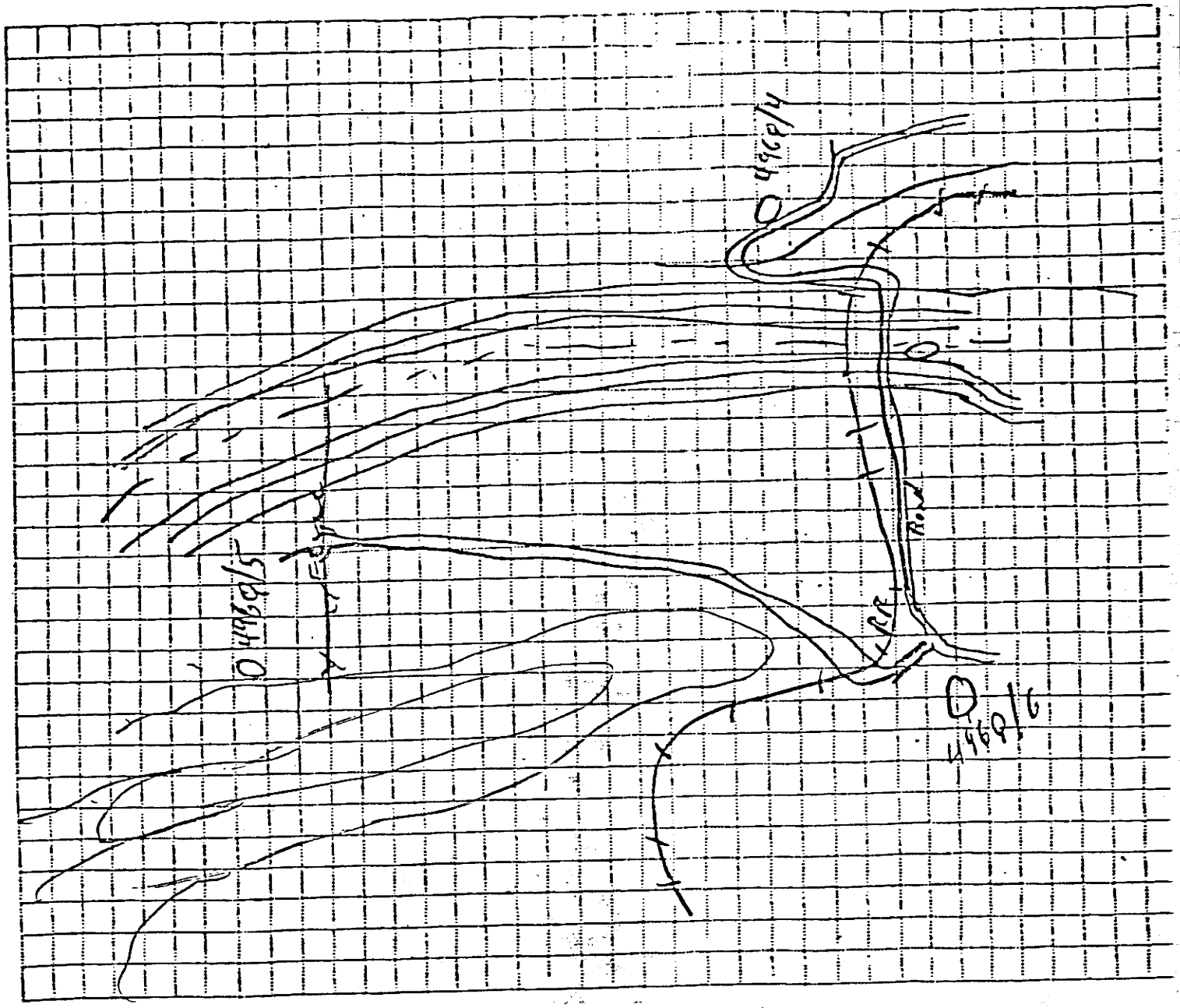
33. Recorded by: W. W. Carpenter

Survey Org. (V/27-28): AERC Date: 11/6/80

Assisting Crew Members: Michael Sloan, Mark Melendez, Robert Stevenson

34. Sponsoring Agency: Plateau Mining Company (PMC-80-1)

Contract No. NA



35. Encoding Form: (all entries are right justified)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
I	4	2	C	6	2	2	3				7	3	2	0		1	2	4	9	9	1	5	0	4	3	7	6	8	0	0	
II	N	U	N	W	N	E	1	0	1	5		5		8		E	E	6		B	B	H	T								
III	A	A									M	Z																	C	J	
IV							Z	Z							A		6	2	5			A	Z	C	C	E	R			
V	C	9	9	9	1	8	0	1			B	1			F	B	1		2		1	3	5	E	B	B	A	E			
VI																															

Form must be accompanied by a site map; photocopy of U.S.G.S. topo map with T., R., scale, and quad name; photographs of the site; and artifact sketches (if applicable).

Bureau of Land Management
Division of State History
University of Utah Archeological Center

2. County Carbon
3. Temp. No. 496Q/5

4. Class: ___ Prehistoric x Historic ___ Paleontologic
5. Cultural Site Type (interpreted function): unknown
6. Paleontological Site Type: __ Invertebrate; __ Vertebrate; __ Flora
7. Elevation (I/11-15) 7440 ft. X .3048= 2267.7 m.
elevation source: topographic map
8. UTM Grid: (I/16-30) zone 12 ; 498750 mE.; 4376450 mN.
9. (II/I-16) SE of NE of NW of Section 10 T. 15S., R. 8E,
10. Map Reference: Wattis, Utah USGS Series: 7.5' Date: 1979
11. Aerial Photo Data: NA
12. Site Location: The site is on the north side of a finger of hill at the base of the finger

13. Land Owner (II/17-18): private
BLM District/Forest (II/19): NA
14. Site Name/Previous Designations: NA
15. Description of Site: The site is a foundation, 8 ft. x 6 ft., of undressed stone; use unknown. The only artifact is a one-foot long piece of 2x4 lumber. Two pieces of purple glass were found 200 feet away.

16. Artifacts: Artifacts should be described/drawn on a continuation sheet and their locations plotted on the site map.

CLASS	QUANTITY
Debitage (II/30)	
Bifaces (III/1-9)	
Scrapers (III/1-9)	
Utilized Flakes	

CLASS		TYPE	QUANTITY
Ceramics	(III/10-21)		
Proj Pnt	(III/1-9)		
Gnd Stn	(II/22-29)		
Glass	(II/22-29)	purple	2
Metal	(II/22-29)		
Nails	(II/22-29)		
Cans	(II/22-29)		
Wood	(II/22-29)	2x4	1 lt.
Other	(II/22-29)		

Description:

17. Non-Structural Features: (describe and locate on site map)(III/22-27)

_hearth/firepit(HE) _rubble mound(RM) _earthen mound(EM) _trail/road(TR)
_midden(MD) _stone circle(SC) _burial(BU) _RR grade(RG)
_depression(DE) X rock alignment(RA) _pictograph(PI) _tram way/road(TW)
_water control(WC) _mine tailings(MT) _petroglyph(PE) _other(OT)

Description: Apparent foundation of undressed stone.

ATTACHMENT #1

Site No. 42Cb224 (496Q/5)

Single rm			Tower		
Multiple rm			Cairn		
Granary			Corral		
Cist			Dugout		
Pithouse			Kiln		
Kiva			Monument		
Well			Mine		

Description: 0

19. Cultural Affiliation (IV/7-14) Euro-American

How Determined? glass present; also sawn timber

20. Site Dimensions: 3 m.X 4 m; Area(IV/17-21) 12 sq m

21. Were surface artifacts collected? ___ Yes x No; (IV/22) If yes, attach a continuation sheet describing sampling method used.

22. Estimated depth of fill (IV/23): unknown.

Subsurface test? ___ Yes; x No (Include location of test on site ma

Description:

23. Site Condition (IV/25): ___ Excellent; ___ Good; ___ Fair; x Poor

Agent of Impact: erosion

24. Nat.Register Potential(V/1): ___ Significant(C); x Non-Significant(D)

Justification: CRRS:S-4; structure present but no apparent debitage

25. Research Potential: low

26. Recommended Mitigation: none

27. Direction/Distance to Permanent Water (V/5-10): 0° / 200 m

Type/Name of Water Source (V/11): Serviceberry Creek/intermittent

Distance to nearest other Water Source (V/2-4): unknown

Type of other Water Source: unknown

Distance to Cultivatable Soil (V/12-14): 10 meters

28. Topographic Location (check one under each heading) (V/15-18)

PRIMARY LANDFORM
- _mountain spine(A)
- _hill/butte(B)
- _tableland/mesa(C)
- _ridge(D)
- _valley(E)
- X plain(F)
- _canyon(G)

POSITION ON LANDFORM
- _top/crest/peak(A)
- X edge(B)
- _slope(C)
- _toe/foot/bottom(D)
- _saddle/pass(E)
- _bench/ledge(F)
- _rimrock(G)
- _interior(H)

DEPOSITIONAL ENVIRONMENT
- _fan(A)
- _talus(B)
- _dune(C)
- _stream terrace(D)
- _playa(E)
- shore feature
  - _extinct lake(F)
  - _extant lake(G)
- _alluvial plain(H)
- X colluvium(I)
- _moraine(J)
- _flood plain(K)
- _marsh(L)
- _landslide/slump(M)
- _delta(N)
- _island(O)
- _cliff(P)
- _outcrop(Q)
- _stream bed(R)

SECONDARY POSITION
- _top/crest/ridge(A)
- _edge(B)
- _slope(C)
- _toe/foot(D)
- _cutbank(E)
- _detached monolith(F)
- _interior(G)
- _step(H)
- _riser(I)
- _port.geo.feature(J)
- _spring mound/bog(K)
- _cave(L)
- _alcove/shelter(M)
- _patterned ground(N)

Description: The site is located at the head of the plain where it narrows at the canyon mouth and on the north base of a hill.

ATTACHMENT #1

30. Vegetation Community and association (V/25):

_[illegible] GRASSLAND(AA)
_SPRUCE FIR(BB)
_aspen(BA)
_white fir-spruce(BB)
_MIXED DOUGLAS FIR(BC)
_limber pine(CA)
_douglas fir(CB)
_ponderosa pine(CC)
_pleistocene pine(CD)
_aspen(CE)
_streamside(CD)
_meadow grassland(CC)

_WILLOW FIRE-OAK(DA)
_ponderosa pine(DA)
_oakbrush(DB)
_mountain brush(DC)
_maple(DD)
_streamside(DE)

_PLAINS/PRAIRIE(EA)
_grasslands(EA)
X pinyon-juniper(EB)
_streamside(EC)

_COLD DESERT SCRUB(FA)
_sagebrush(FA)
_small sagebrush(FB)
_little rabbitbrush(FC)
_shadscale(FD)
_bonebrush(FE)
_winter-fat(FF)
_hop-sage/blkbrsh(FG)
_bud sagebrush(FH)
_mat saltbrush(FI)
_gray molly(FJ)
_streamside(FK)

_SALT DESERT SCRUB(GA)
_greasewood(GA)
_greywood-shadscal(GB)
_seepweed(GC)
_pickleweed/samphire(GD)
_saltgrass(GE)
_alkali sacaton(GF)
_rabbitbrush(GG)

_WARM DESERT SCRUB(H
_desert saltbrush(HA
_creosote bush(HB)
_creosote/burrsage(HC
_joshua tree(HD)
_MARSH COMMUNITY(IA)

_ALKALI FLATS/MUD FLATS/DRY LAKE/ WASTELAND(IB)

_CULTIVATED LAND(JA)

Description: pinyon, juniper, sage, Indian rice grass, serviceberry

31. Next nearest plant association/distance: unknown

32. Photograph Numbers (V/26): 496Q-1 (5) (lost in processing)

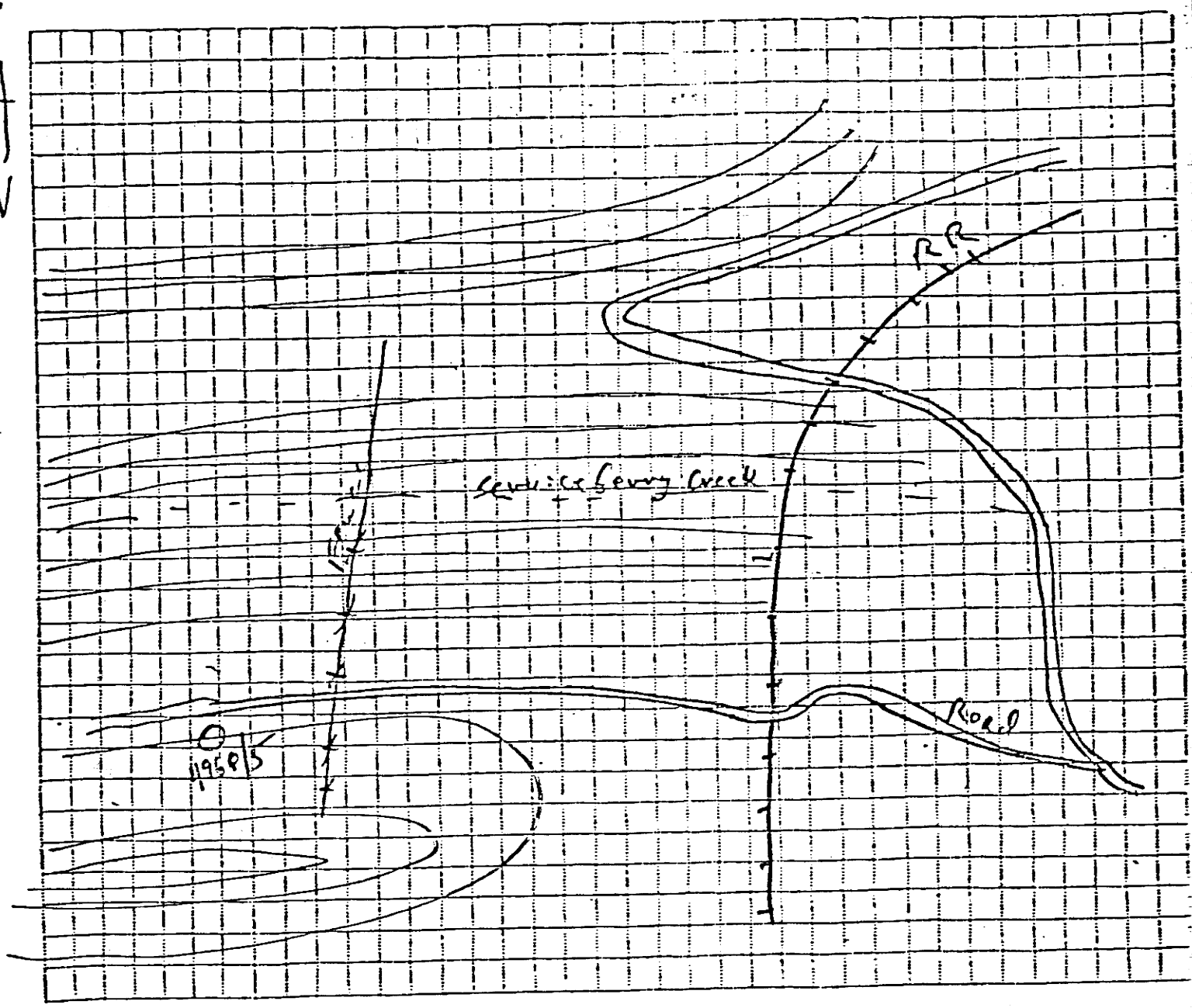
33. Recorded by: W. W. Carpenter

Survey Org. (V/27-28): AERC Date: 11/6/80

Assisting Crew Members: Michael Sloan, Mark Melendez, Robert Stevenson

34. Sponsoring Agency: Plateau Mining Company (PMC-80-1)

Contract No. NA



35. Encoding Form: (all entries are right justified)

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II	S	E	N	E	N	W	1	0	1	5	S	8		E	P	R	G	B	B			0	T								
III	A	B								A	A	A										R	A								
IV							2	2							A		1	2				A	Z	C	D	E	R				
V	D	9	9	9	0			2			B				Y	B	1		3		0			E	B	B	A	E			
VI																															

Form must be accompanied by a site map; photocopy of U.S.G.S. topo map with T., R., scale, and quad name; photographs of the site; and artifact sketches (if applicable).

Bureau of Land Management
Division of State History
University of Utah Archeological Center

2. County Carbon
3. Temp. No. 496Q/6

4. Class: ___ Prehistoric X Historic ___ Paleontologic
5. Cultural Site Type (interpreted function): camp and mine cart
6. Paleontological Site Type: __ Invertebrate; __ Vertebrate; __ Flora
7. Elevation (I/11-15) 7240 ft. X .3048= 2206.7 m.
elevation source: topographic map
8. UTM Grid: (I/16-30) zone 12 ; 499200 mE.; 4376350 mN.
9. (II/I-16) SE of NW of NE of Section 10 T. 15S., R. 8E.
10. Map Reference: Wattis, Utah USGS Series: 7.5' Date: 1979
11. Aerial Photo Data: NA
12. Site Location: The site is located on the east side of the railroad and south of the road on an open sage plain.

13. Land Owner (II/17-18): private
BLM District/Forest (II/19): NA
14. Site Name/Previous Designations: NA
15. Description of Site: The site is a small refuse dump; there is also a horse-drawn wooden mine cart.

16. Artifacts: Artifacts should be described/drawn on a continuation sheet and their locations plotted on the site map.

CLASS	QUANTITY
Debitage (II/30)	
Bifaces (III/1-9)	
Scrapers (III/1-9)	
Utilized Flakes	

CLASS	TYPE	QUANTITY
Ceramics (III/10-21)		
Proj Pnt (III/1-9)		
Gnd Stn (II/22-29)		
Glass (II/22-29)	purple	
Metal (II/22-29)		
Nails (II/22-29)		
Cans (II/22-29)	x	
Wood (II/22-29)	x	
Other (II/22-29)	mine cart	

Description: Remains (fair shape) of a horse-drawn oak ore cart

17. Non-Structural Features: (describe and locate on site map)(III/22-2

_hearth/firepit(HE)	_rubble mound(RM)	_earthen mound(EM)	_trail/road(TR)
X_midden(MD)	_stone circle(SC)	_burial(BU)	_RR grade(RG)
_depression(DE)	_rock alignment(RA)	_pictograph(PI)	_tram way/road(TW)
_water control(WC)	_mine tailings(MT)	_petroglyph(PE)	_other(OT)

Description: small pile of cans and glass

ATTACHMENT #1

UT8100-1 (8/80)

Site No. 42CB225 (496Q/6)

Single rm			Tower		
Multiple rm			Cairn		
Granary			Corral		
Cist			Dugout		
Pithouse			Kiln		
Kiva			Monument		
Well			Mine		

Description: mine cart

19. Cultural Affiliation (IV/7-14) Euro-American

How Determined? Artifacts on site

20. Site Dimensions: 20 m.X 5 m; Area(IV/17-21) 100 sq m

21. Were surface artifacts collected? x Yes ___ No; (IV/22) If yes, attach a continuation sheet describing sampling method used. random

22. Estimated depth of fill (IV/23): 0

Subsurface test? ___ Yes; x No (Include location of test on site map

Description:

23. Site Condition (IV/25): ___ Excellent; x Good; ___ Fair; ___ Poor

Agent of Impact: erosion

24. Nat.Register Potential(V/1): x Significant(C); ___ Non-Significant(D)

Justification: CRRS:S-2; (cart only)

25. Research Potential: non-significant

26. Recommended Mitigation: salvage cart or avoidance

27. Direction/Distance to Permanent Water (V/5-10): 0 / 250 m

Type/Name of Water Source (V/11): Serviceberry Creek

Distance to nearest other Water Source (V/2-4): unknown

Type of other Water Source: unknown

Distance to Cultivatable Soil (V/12-14): 0 m.

28. Topographic Location (check one under each heading) (V/15-18)

PRIMARY LANDFORM
- _mountain spine(A)
- _hill/butte(B)
- _tableland/mesa(C)
- _ridge(D)
- _valley(E)
- X_plain(F)
- _canyon(G)

POSITION ON LANDFORM
- _top/crest/peak(A)
- X_edge(B)
- _slope(C)
- _toe/foot/bottom(D)
- _saddle/pass(E)
- _bench/ledge(F)
- _rimrock(G)
- _interior(H)

DEPOSITIONAL ENVIRONMENT
- _fan(A)
- _talus(B)
- _dune(C)
- _stream terrace(D)
- _playa(E)
- shore feature
  - _extinct lake(F)
  - _extant lake(G)
  - _alluvial plain(H)
- X_colluvium(I)
- _moraine(J)
- _flood plain(K)
- _marsh(L)
- _landslide/slump(M)
- _delta(N)
- _island(O)
- _cliff(P)
- _outcrop(Q)
- _stream bed(R)

SECONDARY POSITION
- _top/crest/ridge(A)
- _edge(B)
- _slope(C)
- _toe/foot(D)
- _cutbank(E)
- _detached monolith(F)
- _interior(G)
- _step(H)
- _riser(I)
- _port.geo.feature(J)
- _spring mound/bog(K)
- _cave(L)
- _alcove/shelter(M)
- _patterned ground(N)

Description: a gullied plain

ATTACHMENT #1

30. Vegetation COMMUNITY and association (V/24-25):

[illegible] GRASSLAND(AA)	_YELLOW PINE-OAK(BA)	_COLD DESERT SCRUB(FA)	_SALT DESERT SCRUB(GA)	_WARM DESERT SCRUB(H
_SPRUCE FIR(AB)	_ponderosa pine(BB)	X sagebrush(FB)	_greasewood(GB)	_desert saltbrush(HB)
_[illegible]hole(AC)	_oakbrush(BC)	_small sagebrush(FC)	_greasewood-shadscal(GC)	_creosote bush(HC)
_white fir-spruce(AD)	_mountain brush(BD)	_little rabbitbrush(FD)	_seepweed(GD)	_creosote/burrsage(HD)
_ASPEN DOUGLAS FIR(AE)	_maple(BE)	_shadscale(FE)	_pickleweed/samphire(GE)	_joshua tree(HE)
_limber pine(AF)	_streamside(BF)	_horsebrush(FF)	_saltgrass(GF)	_MARSH COMMUNITY(HF)
_douglas fir(AG)		_winterfat(FG)	_alkali sacaton(GG)	
_lodgepole pine(AH)	_PLAINS/PRAIRIE(CA)	_hopsage/blkbrsh(FH)	_rabbitbrush(GH)	_ALKALI FLATS/MUD FLATS/DRY LAKE/ WASTELAND(HG)
_bristlecone pine(AI)	_grasslands(CB)	_bud sagebrush(FI)		
_aspen(AJ)	X pinyon-juniper(CC)	_mat saltbrush(FJ)		
_streamside(AK)	_streamside(CD)	_gray molly(FK)		_CULTIVATED LAND(HH)
_meadow grassland(AL)		_streamside(FL)		

Site No. 42Q0225 (7/80)

Description: pinyon, juniper, sage, Indian rice grass

31. Next nearest plant association/distance: unknown

32. Photograph Numbers (V/26): 496Q-1 (6)

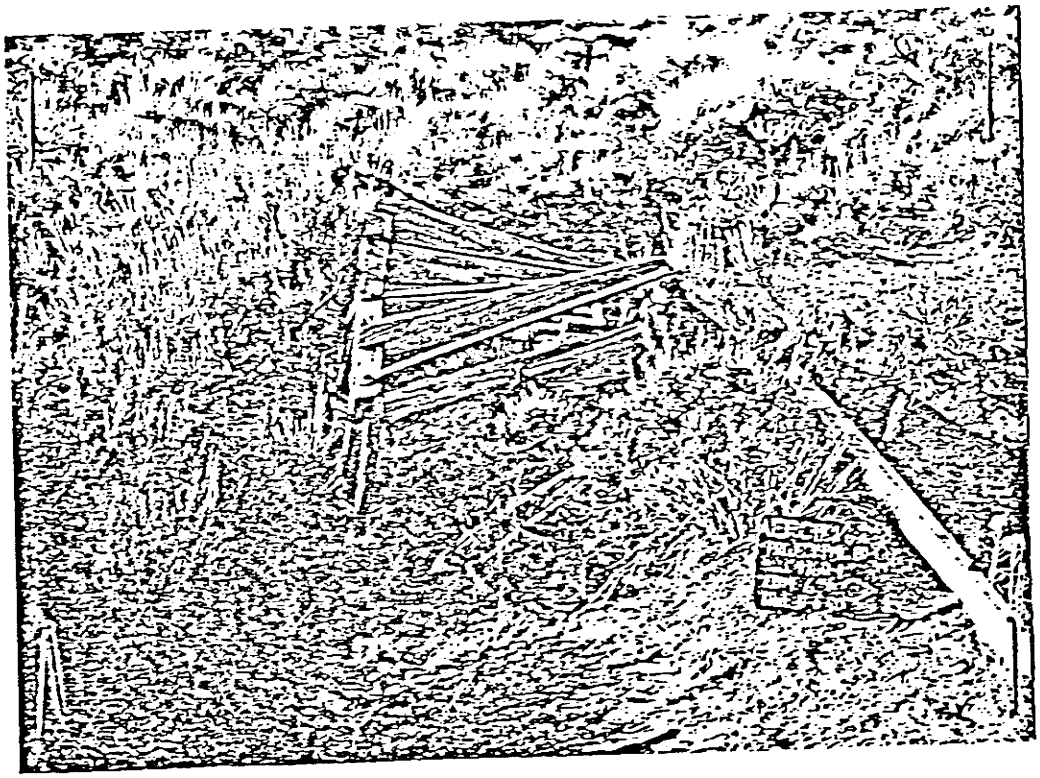
33. Recorded by: W. W. Carpenter

Survey Org. (V/27-28): AERC Date: 11/6/80

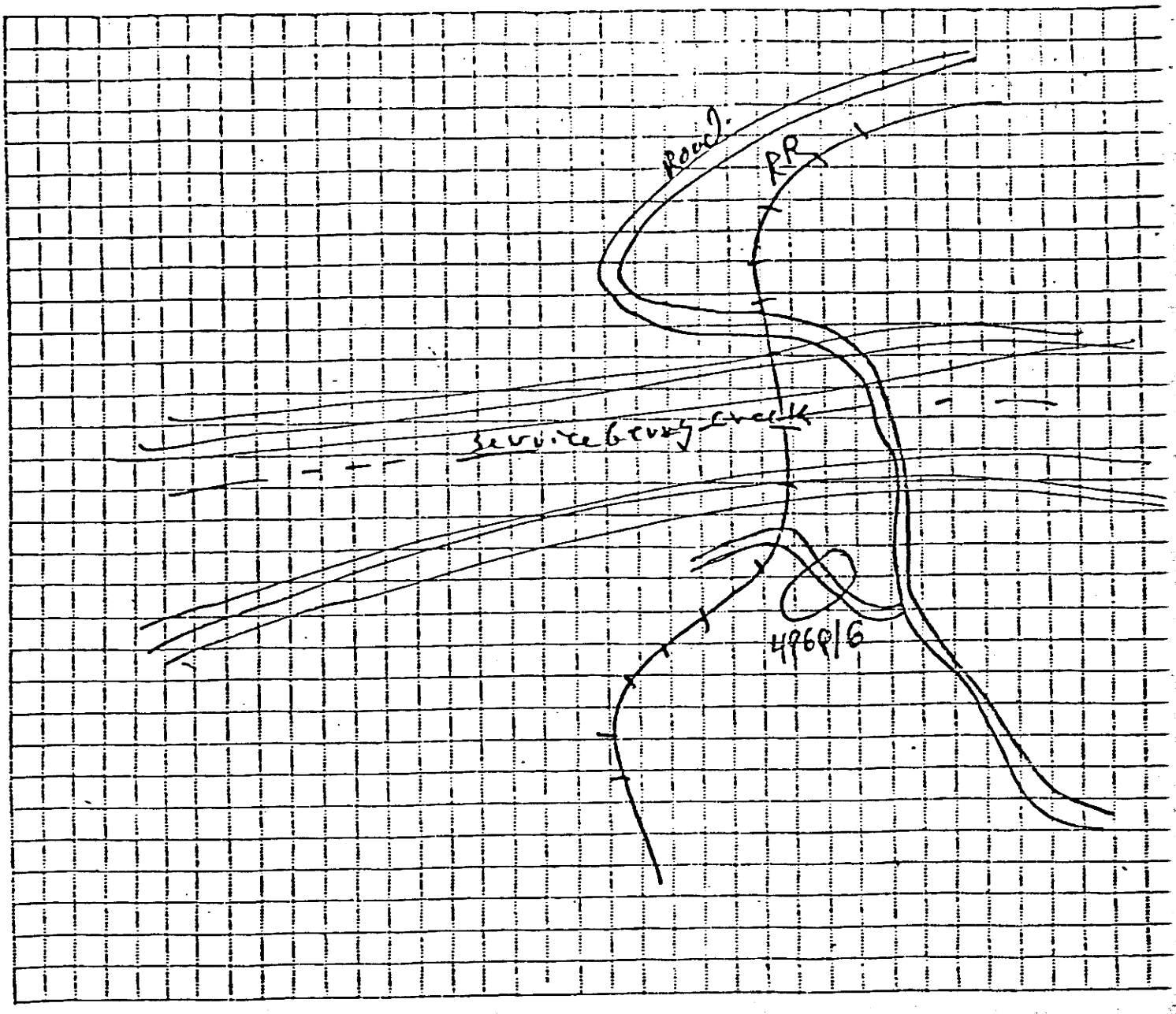
Assisting Crew Members: Michael Sloan, Mark Melendez, Robert Stevenson

34. Sponsoring Agency: Plateau Mining Company (PMC-80-1)

Contract No. NA



496Q/6



35. Encoding Form: (all entries are right justified)

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III																						M	D								
IV							E	A									1	0	0			B			B	E	R				
V	D	R			O			S			B	D			F	B	I		3		1	3	5	E	Z	B	A	E			
VI																															

Form must be accompanied by a site map; photocopy of U.S.G.S. topo map with T., R., scale, and quad name; photographs of the site; and artifact sketches (if applicable).

developed by cooperative agreement by:
Bureau of Land Management
Division of State History
University of Utah Archeological Center

1. Site No. (I/1-10) 42Cb226
2. County Carbon
3. Temp. No. 496Q/7

4. Class: ___ Prehistoric x Historic ___ Paleontologic
5. Cultural Site Type (interpreted function): house foundation
6. Paleontological Site Type: __ Invertebrate; __ Vertebrate; __ Flora
7. Elevation (I/11-15) 7080 ft. X .3048= 2157.9 m.
   elevation source: topographic map
8. UTM Grid: (I/16-30) zone 12 ; 500250 mE.; 4375600 mN.
9. (II/I-16) SW of NE of SW of Section 11 T. 15S., R. 8E.
10. Map Reference: Pinnacle Peak, Utah USGS Series: 7.5' Date: 1972
11. Aerial Photo Data: NA
12. Site Location: The site is 100 feet north of the canyon rim on an open sage plain.

13. Land Owner (II/17-18): BLM
    BLM District/Forest (II/19): Moab
14. Site Name/Previous Designations: NA
15. Description of Site: The site is a 15 foot x 25 foot stone and mortar foundation. There are some pieces of purple glass and old stove parts on the site. No solder cans. There is a pit northwest of the foundation; another, south of the foundation, 15 10 feet in from the lip of the canyon; and a third one 15 cut into the lip of the canyon.

16. Artifacts: Artifacts should be described/drawn on a continuation sheet and their locations plotted on the site map.

CLASS	QUANTITY
Debitage (II/30)	
Bifaces (III/1-9)	
Scrapers (III/1-9)	
Utilized Flakes	

CLASS	TYPE	QUANTITY
Ceramics (III/10-21)		
Proj Pnt (III/1-9)		
Gnd Stn (II/22-29)		
Glass (II/22-29)	purple, green, brown	
Metal (II/22-29)	stove	1
Nails (II/22-29)		
Cans (II/22-29)	yes	
Wood (II/22-29)		
Other (II/22-29)		

Description: artifacts are sparse -- some purple glass, no solder cans.

17. Non-Structural Features: (describe and locate on site map)(III/22-27)

_hearth/firepit(HE)	_rubble mound(RM)	_earthen mound(EM)	_trail/road(TR)
_midden(MD)	_stone circle(SC)	_burial(BU)	_RR grade(RG)
_depression(DE)	_rock alignment(RA)	_pictograph(PI)	_tram way/road(TW)
_water control(WC)	_mine tailings(MT)	_petroglyph(PE)	_other(OT)

Description: NA

ATTACHMENT #1

Site No. 42Cb226 (49GQ/7)

Single rm			Tower		
Multiple rm	concrete & stone foundation	1	Cairn		
Granary			Corral		
Cist			Dugout	X	1
Pithouse			Kiln		
Kiva			Monument		
Well			Mine		

Description: possible root cellars; also house foundation.

19. Cultural Affiliation (IV/7-14) Euro-American

How Determined? artifacts

20. Site Dimensions: 20 m.X 20 m; Area(IV/17-21) 400 sq m

21. Were surface artifacts collected? ___Yes X No; (IV/22) If yes, attach a continuation sheet describing sampling method used.

22. Estimated depth of fill (IV/23): unknown

Subsurface test? ___Yes; X No (Include location of test on site ma

Description:

23. Site Condition (IV/25): ___Excellent; ___Good; ___Fair; X Poor

Agent of Impact: eroision

24. Nat.Register Potential(V/1): ___Significant(C); X Non-Significant(D)

Justification: CRRS:S-2; there is little or no apparent depth on this site, but there are structural remains.

25. Research Potential: good

26. Recommended Mitigation: avoidance or pickup

27. Direction/Distance to Permanent Water (V/5-10): 180° / 100 m

Type/Name of Water Source (V/11): south fork of Serviceberry Cree

Distance to nearest other Water Source (V/2-4): unknown

Type of other Water Source: unknown

Distance to Cultivatable Soil (V/12-14): 1 meter

28. Topographic Location (check one under each heading) (V/15-18)

PRIMARY LANDFORM
- _mountain spine(A)
- _hill/butte(B)
- _tableland/mesa(C)
- _ridge(D)
- _valley(E)
- X plain(F)
- _canyon(G)

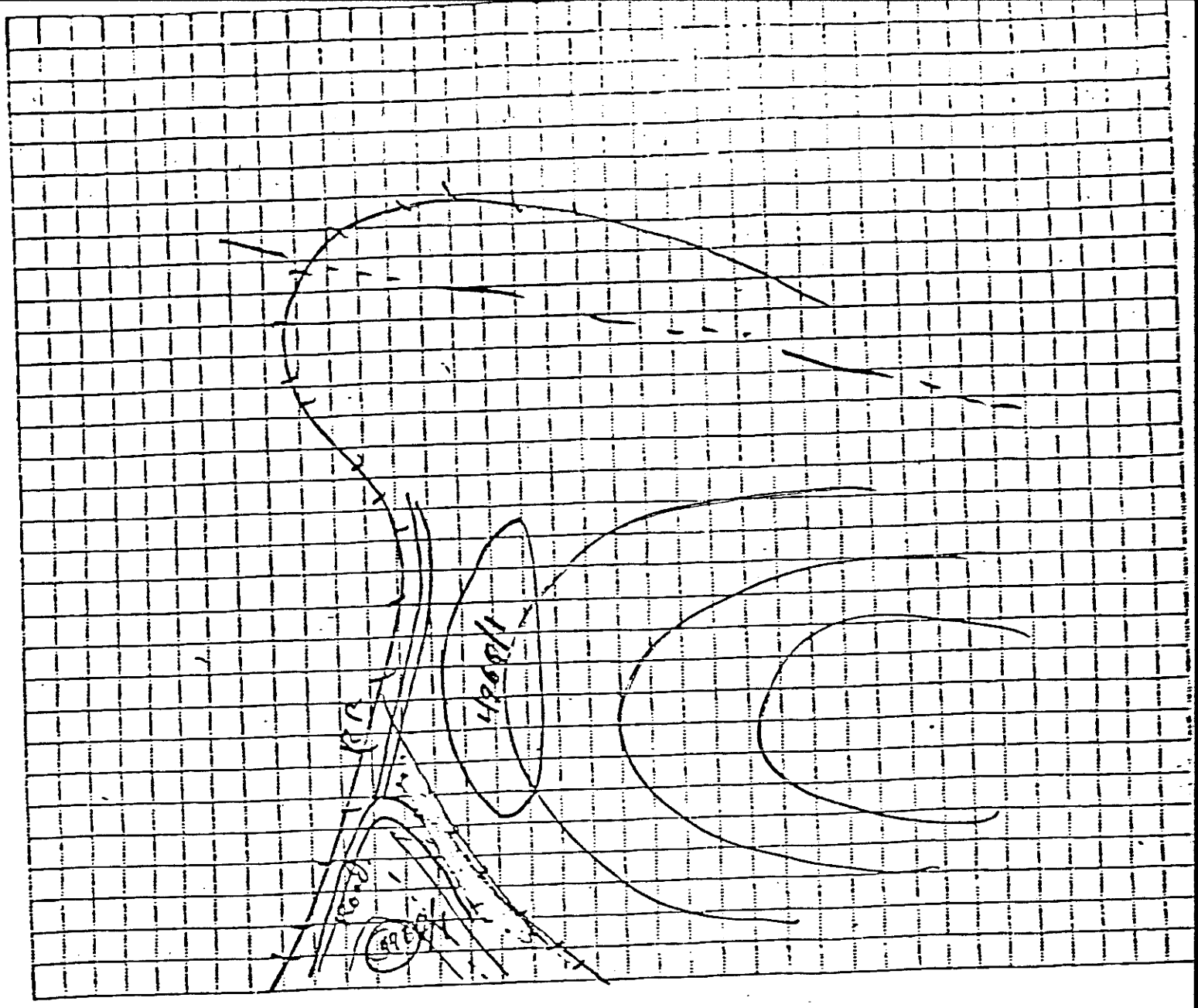
POSITION ON LANDFORM
- _top/crest/peak(A)
- X edge(B)
- _slope(C)
- _toe/foot/bottom(D)
- _saddle/pass(E)
- _bench/ledge(F)
- _rimrock(G)
- _interior(H)

DEPOSITIONAL ENVIRONMENT
- _fan(A)
- _talus(B)
- _dune(C)
- _stream terrace(D)
- _playa(E)
- shore feature
  - _extinct lake(F)
  - _extant lake(G)
- _alluvial plain(H)
- X colluvium(I)
- _moraine(J)
- _flood plain(K)
- _marsh(L)
- _landslide/slump(M)
- _delta(N)
- _island(O)
- _cliff(P)
- _outcrop(Q)
- _stream bed(R)

SECONDARY POSITION
- _top/crest/ridge(A)
- _edge(B)
- _slope(C)
- _toe/foot(D)
- _cutbank(E)
- _detached monolith(F)
- _interior(G)
- _step(H)
- _riser(I)
- _port.geo.feature(J)
- _spring mound/bog(K)
- _cave(L)
- _alcove/shelter(M)
- _patterned ground(N)

Description: The site is on a northeast-sloping plain about 200 feet north of a deep gully or canyon.

ATTACHMENT #1



35. Encoding Form: (all entries are right justified)

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II	N	E	N	W	N	E	1	1	1	5	5		8	E			L	M	6	B	B	H	T	6	2	C	N			Z	
III	~~4~~	A		~~A~~	~~A~~	~~A~~					A	A	A									M	D	U	C	R	G	0			
IV							E	A							G		3	7	5	0	0	B	Z	C	C	E	R				
V	C	0	0	0	1	8	p	8			B	1			F	B	I	D	4		2	7	0	F	A	B	A	E			
VI																															

Form must be accompanied by a site map; photocopy of U.S.G.S. topo map with T., R., scale, and quad name; photographs of the site; and artifact sketches (if applicable).

Bureau of Land Management
Division of State History
University of Utah Archeological Center

2. County Carbon
3. Temp. No. 4960/2

4. Class: x Prehistoric ___ Historic ___ Paleontologic
5. Cultural Site Type (interpreted function): Lithic scatter, hunting
6. Paleontological Site Type: __ Invertebrate; __ Vertebrate; __ Flora
7. Elevation (I/11-15) 7080 ft. X .3048= 2157.98 m.
elevation source: topographic map
8. UTM Grid: (I/16-30) zone 12 ; 500150 mE.; 4376125 mN.
9. (II/I-16) NE of SE of NW of Section 11 T. 15S., R. 8E.
10. Map Reference: Pinnacle Peak, UT USGS Series: 7.5' Date: 1972
11. Aerial Photo Data: NA
12. Site Location: The site is on the north side of a deep canyon (100 ft.) with a large plain to the north sloping down to the north and east.

13. Land Owner (II/17-18): BLM
BLM District/Forest (II/19): Moab
14. Site Name/Previous Designations: NA
15. Description of Site: The site is a small lithic scatter 20 to 25 meters across. The entire north edge of Serviceberry Creek (the top of the canyon) appears, by the flake distribution and type, to have been a hunting spot with the hunters waiting 15-40 ft. back fro the lip for the deer or other game to come over the lip. This is still a preferred spot with numerous modern cartridge casings along the edge.

16. Artifacts: Artifacts should be described/drawn on a continuation sheet and their locations plotted on the site map.

CLASS	QUANTITY
Debitage (II/30)	50 & up
Bifaces (III/1-9)	
Scrapers (III/1-9)	
Utilized Flakes	

CLASS	TYPE	QUANTITY
Ceramics (III/10-21)		
Proj Pnt (III/1-9)		1
Gnd Stn (II/22-29)		
Glass (II/22-29)		
Metal (II/22-29)		
Nails (II/22-29)		
Cans (II/22-29)		
Wood (II/22-29)		
Other (II/22-29)		

Description: Dart point, rose pink chert

17. Non-Structural Features: (describe and locate on site map)(III/22-27

_hearth/firepit(HZ) _rubble mound(ZM) _earthen mound(EM) _trail/road(TR)
_midden(MD) _stone circle(SC) _burial(ZU) _RR grade(RG)
_depression(DE) _rock alignment(RA) _pictograph(PI) _tram way/road(TW)
_water control(WC) _mine tailings(MT) _petroglyph(PE) _other(OT)

Description: NA

ATTACHMENT #1

Site No. 42 21 960

Multiple rm			Corral		
Granary			Dugout		
Cist			Kiln		
Pithouse			Monument		
Kiva			Mine		
Well					

Description: NA

19. Cultural Affiliation (IV/7-14) Archaic

How Determined? point

20. Site Dimensions: 20 m. X 20 m; Area (IV/17-21) 400 sq m

21. Were surface artifacts collected? x Yes ___ No; (IV/22) If yes, attach a continuation sheet describing sampling method used: random

22. Estimated depth of fill (IV/23): 0

Subsurface test? ___ Yes; x No (Include location of test on site ma

Description:

23. Site Condition (IV/25): ___ Excellent; ___ Good; x Fair; ___ Poor

Agent of Impact: erosion

24. Nat. Register Potential (V/1): x Significant (C); ___ Non-Significant (D)

Justification: possible Archaic point located, CRRS:S-2

25. Research Potential: Good

26. Recommended Mitigation: Avoidance or pickup

27. Direction/Distance to Permanent Water (V/5-10): 180° / 50 m

Type/Name of Water Source (V/11): Service berry Creek

Distance to nearest other Water Source (V/2-4): 1 km.

Type of other Water Source: intermittent creek

Distance to Cultivatable Soil (V/12-14): 10 meters

28. Topographic Location (check one under each heading) (V/15-18)

PRIMARY LANDFORM
- _ mountain spine (A)
- _ hill/butte (B)
- _ tableland/mesa (C)
- _ ridge (D)
- _ valley (E)
- X plain (F)
- _ canyon (G)

POSITION ON LANDFORM
- _ top/crest/peak (A)
- X edge (B)
- _ slope (C)
- _ toe/foot/bottom (D)
- _ saddle/pass (E)
- _ bench/ledge (F)
- _ rimrock (G)
- _ interior (H)

DEPOSITIONAL ENVIRONMENT
- _ fan (A)
- _ talus (B)
- _ dune (C)
- _ stream terrace (D)
- _ playa (E)
- shore feature
  - _ extinct lake (F)
  - _ extant lake (G)
- _ alluvial plain (H)
- X colluvium (I)
- _ marine (J)
- _ flood plain (K)
- _ marsh (L)
- _ landslide/slump (M)
- _ delta (N)
- _ island (O)
- _ cliff (P)
- _ outcrop (Q)
- _ stream bed (R)

SECONDARY POSITION
- _ top/crest/ridge (A)
- X edge (B)
- _ slope (C)
- _ toe/foot (D)
- _ cutbank (E)
- _ detached monolith (F)
- _ interior (G)
- _ strip (H)
- _ riser (I)
- _ pert. geo. feature (J)
- _ spring mound/bog (K)
- _ cave (L)
- _ alcove/shelter (M)
- _ patterned ground (N)

Description: The site is on the southwest edge of a north down-sloping plain with a 100 ft. deep canyon on the south side of the site

ATTACHMENT #1

UT8100-1 (8/80)

30. Vegetation COMMUNITY and association (V/24-25)

[illegible] (AA)
[illegible] (BA)
[illegible] (BB)
[illegible] (BC)
[illegible] (BD)
[illegible] (BE)
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Description: pinyon, juniper, sage, Indian rice grass

31. Next nearest plant association/distance: unknown

32. Photograph Numbers (V/26): 4960-1 (2)

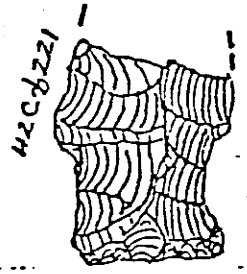
33. Recorded by: W. W. Carpenter

Survey Org. (V/27-28): AERC Date: 11/5/80

Assisting Crew Members: Michael Sloan, Mark Melendez, Robert Stevenson

34. Sponsoring Agency: Plateau Mining Company (PMC-80-1)

Contract No. NA



ATTACHMENT #

UT8100-1 (8/80)

Bureau of Land Management
Division of State History
University of Utah Archeological Center

2. County Carbon
3. Temp. No. 496Q/3

4. Class: x Prehistoric ___ Historic ___ Paleontologic
5. Cultural Site Type (interpreted function): Lithic scatter, hunting
6. Paleontological Site Type: __ Invertebrate; __ Vertebrate; __ Flora
7. Elevation (I/11-15) 7160 ft. X .3048= 2182 m.
elevation source: topographic map
8. UTM Grid: (I/16-30) zone 12 ; 499700 mE.; 4376300 mN.
9. (II/I-16) NE of SE of NE of Section 10 T. 15S. , R. 8E.
10. Map Reference: Wattis, Utah USGS Series: 7.5' Date: 1979
11. Aerial Photo Data: NA
12. Site Location: The site is on the north lip of a deep, steep canyon (Serviceberry Creek) on a NE-sloping bench.

13. Land Owner (II/17-18): Private
BLM District/Forest (II/19): NA
14. Site Name/Previous Designations: NA
15. Description of Site: The site is a sparse lithic scatter with tertiary flakes of chert and quartzite. The entire north lip of the canyon of Service berry Creek appears, by the type and distribution of flakes, to have been a preferred hunting spot, with the hunters waiting 15-40 ft. back from the lip for the game to come up out of the canyon. Many modern cartridge casings are scattered along the same lip.

16. Artifacts: Artifacts should be described/drawn on a continuation sheet and their locations plotted on the site map.

CLASS	QUANTITY
Debitage (II/30)	30+
Bifaces (III/1-9)	
Scrapers (III/1-9)	
Utilized Flakes	

CLASS	TYPE	QUANTITY
Ceramics (III/10-21)		
Proj Pnt (III/1-9)		
Gnd Stn (II/22-29)		
Glass (II/22-29)		
Metal (II/22-29)		
Nails (II/22-29)		
Cans (II/22-29)		
Wood (II/22-29)		
Other (II/22-29)		

Description: Clear, red, pink chert; green and white quartzite site

17. Non-Structural Features: (describe and locate on site map)(III/22-27)

_hearth/firepit(FE) _rubble mound(RM) _earthen mound(EM) _trail/road(TR)
_midden(MD) _stone circle(SC) _burial(BU) _R2 grade(RG)
_depression(DE) _rock alignment(RA) _pictograph(PI) _tram way/road(TW)
_water control(WC) _mine tailings(MT) _petroglyph(PE) _other(OT)

Description: NA

ATTACHMENT #1

Single rm			Tower		
Multiple rm			Cairn		
Granary			Corral		
Cist			Dugout		
Pithouse			Kiln		
Kiva			Monument		
Well			Mine		

Description: 0

19. Cultural Affiliation (IV/7-14) unknown

How Determined?

20. Site Dimensions: 5 m.X 15 m; Area(IV/17-21) 75 sq m

21. Were surface artifacts collected? ___Yes x No; (IV/22) If yes, attach a continuation sheet describing sampling method used.

22. Estimated depth of fill (IV/23): unknown

Subsurface test? ___Yes; x No (Include location of test on site map

Description:

23. Site Condition (IV/25): ___Excellent; ___Good; x Fair; ___Poor

Agent of Impact: erosion

24. Nat.Register Potential(V/1): ___Significant(C); x Non-Significant(D)

Justification: CRRS:S-3; no depth, no structures, and no diagnostics present.

25. Research Potential: poor

26. Recommended Mitigation: avoidance or pickup

27. Direction/Distance to Permanent Water (V/5-10): 180° / 50 m

Type/Name of Water Source (V/11): Serviceberry Creek

Distance to nearest other Water Source (V/2-4): 1 km.

Type of other Water Source: intermittent stream

Distance to Cultivatable Soil (V/12-14): 5 meters

28. Topographic Location (check one under each heading) (V/15-18)

PRIMARY LANDFORM
- _mountain spine(A)
- _hill/butte(B)
- _tableland/mesa(C)
- _ridge(D)
- _valley(E)
- X plain(F)
- _canyon(G)

POSITION ON LANDFORM
- _top/crest/peak(A)
- X edge(B)
- _slope(C)
- _toe/foot/bottom(D)
- _saddle/pass(E)
- _bench/ledge(F)
- _rimrock(G)
- _interior(H)

DEPOSITIONAL ENVIRONMENT
- _fan(A)
- _talus(B)
- _dune(C)
- _stream terrace(D)
- _playa(E)
- shore feature
  - _extinct lake(F)
  - _extant lake(G)
  - _alluvial plain(H)
- X colluvium(I)
- _moraine(J)
- _flood plain(K)
- _marsh(L)
- _landslide/slump(M)
- _delta(N)
- _island(O)
- _cliff(P)
- _outcrop(Q)
- _stream bed(R)

SECONDARY POSITION
- _top/crest/ridge(A)
- _edge(B)
- _slope(C)
- _toe/foot(D)
- _cutbank(E)
- _detached monolith(F)
- _interior(G)
- _step(H)
- _riser(I)
- _port.geo.feature(J)
- _spring mound/bog(K)
- _cave(L)
- _alcove/shelter(M)
- _patterned ground(N)

Description: The site is on a northeast down-sloping plain with a deep canyon (100-125 ft.) at the south edge.

30. Vegetation COMMUNITY and association (V/24-25):

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_[illegible] (DA)
_ponderosa pine (DB)
_oakbrush (DC)
_mountain brush (DD)
_maple (DE)
_streamside (DF)

_[illegible]/PRAIRIE (EA)
_grasslands (EB)
_pinyon-juniper (EC)
_streamside (ED)

_COLD DESERT SCRUB (FA)
_sagebrush (FB)
_small sagebrush (FC)
_little rabbitbrush (FD)
_chamaeal (FE)
_horsebrush (FF)
_winter-fat (FG)
_bog-sage/blkbrush (FH)
_bud sagebrush (FI)
_mat saltbrush (FJ)
_gray molly (FK)
_streamside (FL)

_HOT DESERT SCRUB (GA)
_greasewood (GB)
_greasewood-shadscal (GC)
_seepweed (GD)
_pickleweed/samphire (GE)
_saltgrass (GF)
_alkali sacaton (GG)
_rabbitbrush (GH)

_[illegible] DESERT SCRUB (HA)
_desert saltbrush (HB)
_creosote bush (HC)
_creosote/bursage (HD)
_joshua tree (HE)
_MESA COMMUNITY (HF)

_[illegible] FLATS/[illegible] FLATS/DRY LAKE/ WASTELAND (IA)

_CULTIVATED LAND (JA)

Description: pinyon, juniper, sage, Indian rice grass

31. Next nearest plant association/distance: unknown

32. Photograph Numbers (V/26): 496Q-1 (3)

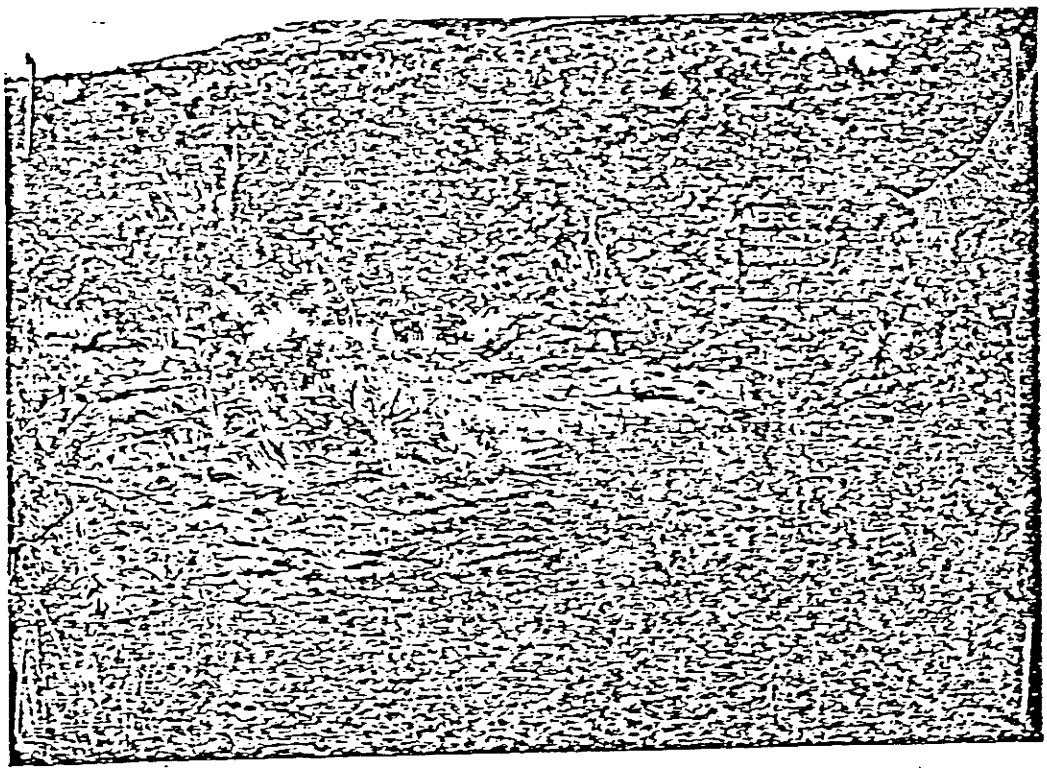
33. Recorded by: W. W. Carpenter

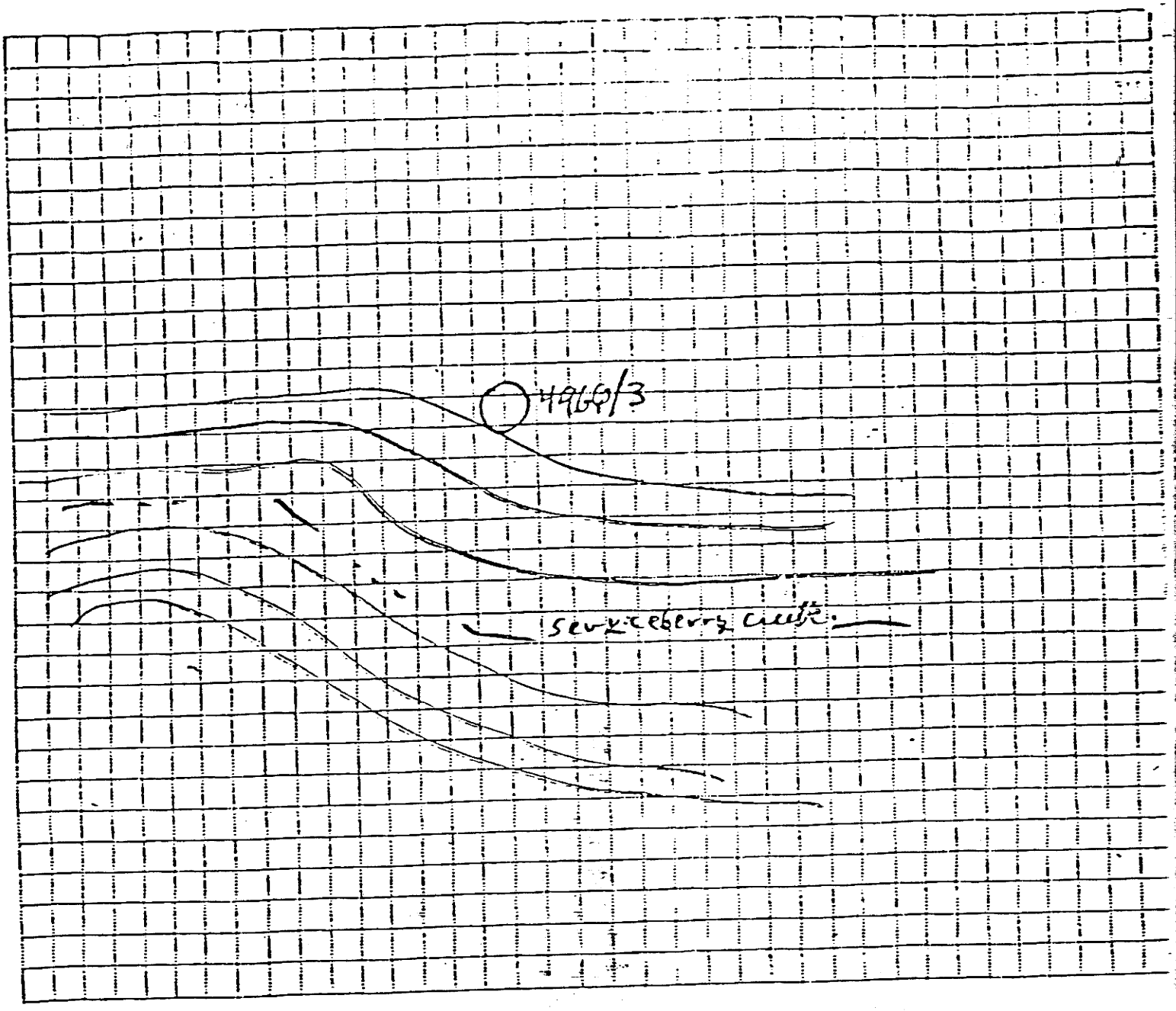
Survey Org. (V/27-28): AERC Date: 11/5/80

Assisting Crew Members: Micahel Sloan, Mark Melendez, Robert Stevenson

34. Sponsoring Agency: Plateau Mining Company (PMC-80-1)

Contract No. NA





35. Encoding Form: (all entries are right justified)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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II	N	E	S	E	N	E	1	D	1	5		S	8	E			P	R	6	B	G	L	S							Z	
III	A									A	A	A																			
IV							Z	Z							Z		7	5				A	Z	C	C	E	R			
V	D	9	9	9	1	8	0	D			B				F	B	1	Z	2		4	5		E	B	B	A	E			
VI																															

Form must be accompanied by a site map; photocopy of U.S.G.S. topo map with T., R., scale, and quad name; photographs of the site; and artifact sketches (if applicable).

developed by cooperative agreement by:
Bureau of Land Management
Division of State History
University of Utah Archeological Center

1. Site No. (I/1-10) 42CB229
2. County Carbon
3. Temp. No. 496Q/4

4. Class: ___ Prehistoric x Historic ___ Paleontologic
5. Cultural Site Type (interpreted function): corral
6. Paleontological Site Type: ___ Invertebrate; ___ Vertebrate; ___ Flora
7. Elevation (I/11-15) 7320 ft. X .3048= 2231 m.
   elevation source: topographic map
8. UTM Grid: (I/16-30) zone 12 ; 499150 mE.; 4376800 mN.
9. (II/I-16) NW of NW of NE of Section 10 T. 15S., R. 8E.
10. Map Reference: Wattis, Utah USGS Series: 7.5' Date: 1979
11. Aerial Photo Data: NA
12. Site Location: The site is located at the opening of a south-facing bay with the road south of it and a deep canyon 75 ft. south.

13. Land Owner (II/17-18): Private
    BLM District/Forest (II/19): NA
14. Site Name/Previous Designations: NA
15. Description of Site: The site is a corral made of large cottonwood and pinyon logs about 30 feet across. One piece of china and some barbed wire were found.

16. Artifacts: Artifacts should be described/drawn on a continuation sheet and their locations plotted on the site map.

CLASS	QUANTITY
Debitage (II/30)	
Bifaces (III/1-9)	
Scrapers (III/1-9)	
Utilized Flakes	

CLASS	TYPE	QUANTITY
Ceramics (III/10-21)		
Proj Pnt (III/1-9)		
Gnd Stn (II/22-29)		
Glass (II/22-29)		
Metal (II/22-29)	barbed wire	1
Nails (II/22-29)		
Cans (II/22-29)		
Wood (II/22-29)		
Other (II/22-29)	china	1

Description: barbed wire, not over 75 years old; china unidentifiable

17. Non-Structural Features: (describe and locate on site map)(III/22-27)

_hearth/firepit(HE)	_rubble mound(RM)	_earthen mound(EM)	_trail/road(TR)
_midden(MD)	_stone circle(SC)	_burial(BU)	_RR grade(RG)
_depression(DE)	_rock alignment(RA)	_pictograph(PI)	_tram way/road(TW)
_water control(WC)	_mine tailings(MT)	_petroglyph(PE)	_other(OT)

Description: NA

ATTACHMENT #1

Site No. 42Cb223 (496Q/4)

Single rm			Tower		
Multiple rm			Cairn		
Granary			Corral	wood	1
Cist			Dugout		
Pithouse			Kiln		
Kiva			Monument		
Well			Mine		

Description: The corral uses existing trees as some of the posts. The corral is about 30 feet across and 3-4 feet high.

19. Cultural Affiliation (IV/7-14) Euro-American

How Determined? garbage

20. Site Dimensions: 25 m.X 25 m; Area(IV/17-21) 625 sq m

21. Were surface artifacts collected? ___Yes x No; (IV/22) If yes, attach a continuation sheet describing sampling method used.

22. Estimated depth of fill (IV/23): unknown

Subsurface test? ___Yes; x No (Include location of test on site ma

Description:

23. Site Condition (IV/25): ___Excellent; ___Good; x Fair; ___Poor

Agent of Impact: erosion

24. Nat.Register Potential(V/1): ___Significant(C); x Non-Significant(D)

Justification: CRRS:S-2; no apparent depth but there is a structure present.

25. Research Potential: low

26. Recommended Mitigation: avoidance

27. Direction/Distance to Permanent Water (V/5-10): 180° / 150 m

Type/Name of Water Source (V/11): Serviceberry Creek, intermitten

Distance to nearest other Water Source (V/2-4): 500 meters

Type of other Water Source: intermittent creek

Distance to Cultivatable Soil (V/12-14): 100 meters.

28. Topographic Location (check one under each heading) (V/15-18)

PRIMARY LANDFORM
- _mountain spine(A)
- _hill/butte(B)
- _tableland/mesa(C)
- _ridge(D)
- _valley(E)
- X_plain(F)
- _canyon(G)

POSITION ON LANDFORM
- _top/crest/peak(A)
- X_edge(B)
- _slope(C)
- _toe/foot/bottom(D)
- _saddle/pass(E)
- _bench/ledge(F)
- _rimrock(G)
- _interior(H)

DEPOSITIONAL ENVIRONMENT
- _fan(A)
- _talus(B)
- _dune(C)
- _stream terrace(D)
- _playa(E)
- shore feature
  - _extinct lake(F)
  - _extant lake(G)
  - _alluvial plain(H)
- X_colluvium(I)
- _moraine(J)
- _flood plain(K)
- _marsh(L)
- _landslide/slump(M)
- _delta(N)
- _island(O)
- _cliff(P)
- _outcrop(Q)
- _stream bed(R)

SECONDARY POSITION
- _top/crest/ridge(A)
- _edge(B)
- _slope(C)
- _toe/foot(D)
- _cutbank(E)
- _detached monolith(F)
- _interior(G)
- _step(H)
- _riser(I)
- _port.geo.feature(J)
- _spring mound/bog(K)
- _cave(L)
- _alcove/shelter(M)
- _patterned ground(N)

Description: The site is located where the upper canyon of Serviceberry Creek opens out into a plain.

30. Vegetation COMMUNITY and association (V/24-25):

[illegible] GRASSLAND(AA)
_SPRUCE FIR(BB)
_aspenholz(BA)
_white fir-spruce(BB)
_DOUGLAS FIR(CC)
_limber pine(CA)
_douglas fir(CB)
_lodgepole pine(CC)
_bristlecone pine(CD)
_aspen(CE)
_streamside(CF)
_meadow grassland(CG)

_YELLOW PINE-OAK(DZ)
_ponderosa pine(DA)
_oakbrush(DB)
_mountain brush(DC)
_maple(DD)
_streamside(DE)

_PLAINS/PRAIRIE(EE)
_grasslands(EA)
X_pinyon-juniper(EB)
_streamside(EC)

_COLD DESERT SCRUB(FZ)
_sagebrush(FA)
_small sagebrush(FB)
_little rabbitbrush(FC)
_shadscale(FD)
_horsebrush(FE)
_winter-fat(FF)
_bog-sage/blkbrsh(FG)
_bud sagebrush(FH)
_mat saltbrush(FI)
_gray molly(FJ)
_streamside(FK)

_SALT DESERT SCRUB(GZ)
_greasewood(GA)
_greasewood-shadscal(GB)
_seepweed(GC)
_pickleweed/samphire(GD)
_saltgrass(GE)
_alkali sacaton(GF)
_rabbitbrush(GG)

_WARM DESERT SCRUB(H
_desert saltbrush(HA
_creosote bush(HB)
_creosote/burrsage(HC
_joshua tree(HD)
_MESA COMMUNITY(HA)

_ALPINE FLATS/MOD FLATS/DRY LAKE/ WASTELAND(IZ)

_CULTIVATED LAND(JZ)

Description: pinyon, juniper, Indian rice grass, service berry, rabbit brush, sage

31. Next nearest plant association/distance: unknown

32. Photograph Numbers (V/26): 4960-1 (4)

33. Recorded by: W. W. Carpenter

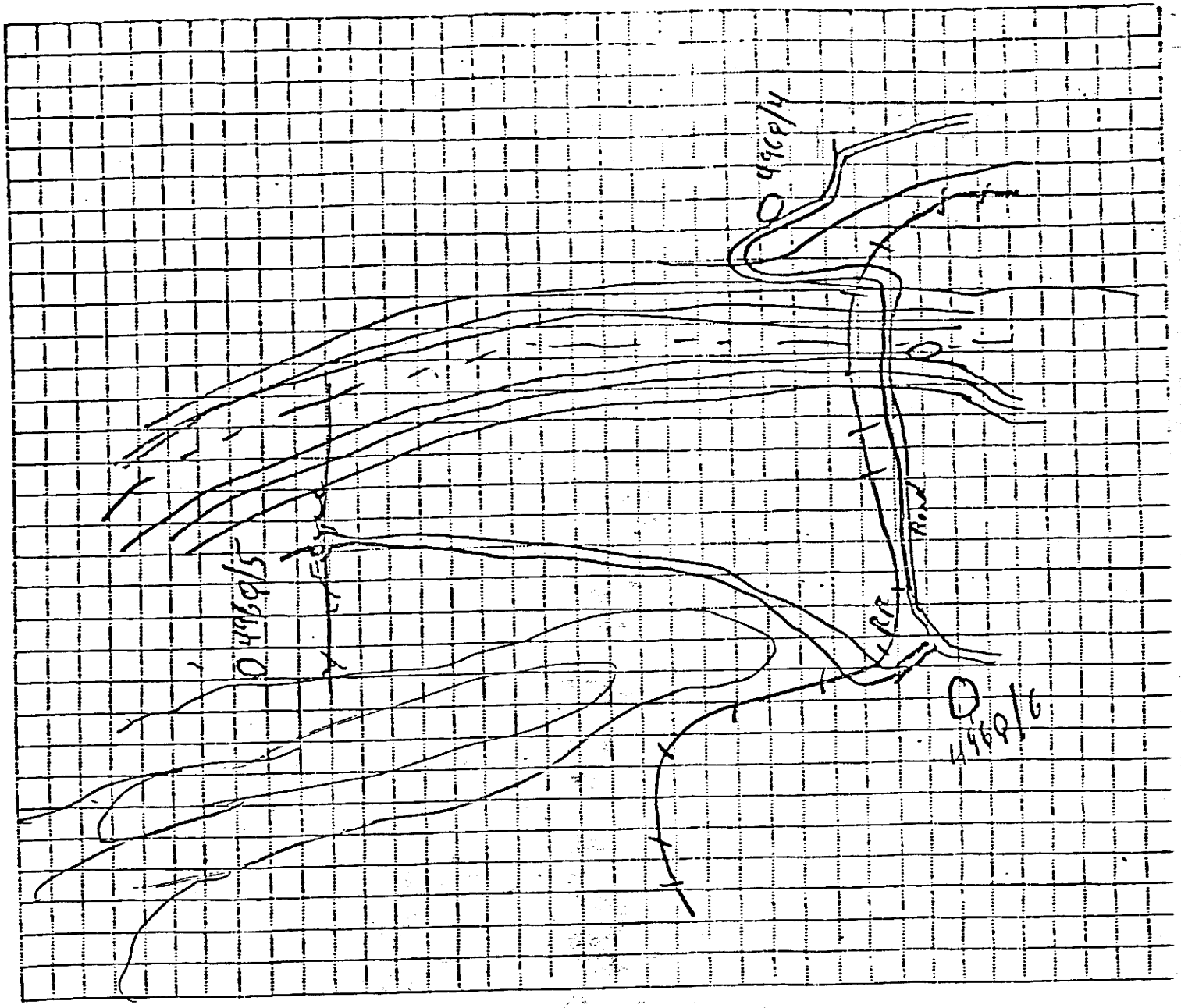
Survey Org. (V/27-28): AERC Date: 11/6/80

Assisting Crew Members: Michael Sloan, Mark Melendez, Robert Stevenson

34. Sponsoring Agency: Plateau Mining Company (PMC-80-1)

Contract No. NA

Site No. 42UB22 (4)



35. Encoding Form: (all entries are right justified)

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II	N	W	N	W	N	E	1	0	1	5		5		8		E	F	6	B	B	H	T									
III	A	A								B	H	Z																	J	C	J
IV							Z	Z							A		6	2	5			A	Z	C	C	E	R			
V	C	9	9	9	1	8	0	1			B	1			F	B	1		2		1	3	5	E	B	B	A	E			
VI																															

Form must be accompanied by a site map; photocopy of U.S.G.S. topo map with T., R., scale, and quad name; photographs of the site; and artifact sketches (if applicable).

Developed by cooperative agreement by:
Bureau of Land Management
Division of State History
University of Utah Archeological Center

2. County Carbon
3. Temp. No. 496Q/5

4. Class: ___ Prehistoric X Historic ___ Paleontologic
5. Cultural Site Type (interpreted function): unknown
6. Paleontological Site Type: __ Invertebrate; __ Vertebrate; __ Flora
7. Elevation (I/11-15) 7440 ft. X .3048= 2267.7 m.
elevation source: topographic map
8. UTM Grid: (I/16-30) zone 12 ; 498750 mE.; 4376450 mN.
9. (II/I-16) SE of NE of NW of Section 10 T. 15S., R. 8E,
10. Map Reference: Wattis, Utah USGS Series: 7.5' Date: 1979
11. Aerial Photo Data: NA
12. Site Location: The site is on the north side of a finger of hill at the base of the finger

13. Land Owner (II/17-18): private
BLM District/Forest (II/19): NA
14. Site Name/Previous Designations: NA
15. Description of Site: The site is a foundation, 8 ft. x 6 ft., of undressed stone; use unknown. The only artifact is a one-foot long piece of 2x4 lumber. Two pieces of purple glass were found 200 feet away.

16. Artifacts: Artifacts should be described/drawn on a continuation sheet and their locations plotted on the site map.

CLASS	QUANTITY
Debitage(II/30)	
Bifaces (III/1-9)	
Scrapers(III/1-9)	
Utilized Flakes	

CLASS	TYPE	QUANTITY
Ceramics(III/10-21)		
Proj Pnt(III/1-9)		
Gnd Stn(II/22-29)		
Glass (II/22-29)	purple	2
Metal (II/22-29)		
Nails (II/22-29)		
Cans (II/22-29)		
Wood (II/22-29)	2x4	1 ft.
Other (II/22-29)		

Description:

17. Non-Structural Features: (describe and locate on site map)(III/22-27)

_hearth/firepit(HE)	_rubble mound(RM)	_earthen mound(EM)	_trail/road(TR)
_midden(MD)	_stone circle(SC)	_burial(BU)	_RR grade(RG)
_depression(DE)	X rock alignment(RA)	_pictograph(PI)	_tram way/road(TW)
_water control(WC)	_mine tailings(MT)	_petroglyph(PE)	_other(OT)

Description: Apparent foundation of undressed stone.

ATTACHMENT #1

Site No. 42Cb224 (4960/5)

Single rm			Tower		
Multiple rm			Cairn		
Granary			Corral		
Cist			Dugout		
Pithouse			Kiln		
Kiva			Monument		
Well			Mine		

Description: 0

19. Cultural Affiliation (IV/7-14) Euro-American

How Determined? glass present; also sawn timber

20. Site Dimensions: 3 m.X 4 m; Area(IV/17-21) 12 sq m

21. Were surface artifacts collected? ___ Yes x No; (IV/22) If yes, attach a continuation sheet describing sampling method used.

22. Estimated depth of fill (IV/23): unknown

Subsurface test? ___ Yes; x No (Include location of test on site ma

Description:

23. Site Condition (IV/25): ___ Excellent; ___ Good; ___ Fair; x Poor

Agent of Impact: erosion

24. Nat.Register Potential(V/1): ___ Significant(C); x Non-Significant(D)

Justification: CRRS:S-4; structure present but no apparent debitage

25. Research Potential: low

26. Recommended Mitigation: none

27. Direction/Distance to Permanent Water (V/5-10): 0° / 200 m

Type/Name of Water Source (V/11): Serviceberry Creek/intermittent

Distance to nearest other Water Source (V/2-4): unknown

Type of other Water Source: unknown

Distance to Cultivatable Soil (V/12-14): 10 meters

28. Topographic Location (check one under each heading) (V/15-18)

PRIMARY LANDFORM
- _ mountain spine(A)
- _ hill/butte(B)
- _ tableland/mesa(C)
- _ ridge(D)
- _ valley(E)
- X plain(F)
- _ canyon(G)

POSITION ON LANDFORM
- _ top/crest/peak(A)
- X edge(B)
- _ slope(C)
- _ toe/foot/bottom(D)
- _ saddle/pass(E)
- _ bench/ledge(F)
- _ rimrock(G)
- _ interior(H)

DEPOSITIONAL ENVIRONMENT
- _ fan(A)
- _ talus(B)
- _ dune(C)
- _ stream terrace(D)
- _ playa(E)
- shore feature
  - _ extinct lake(F)
  - _ extant lake(G)
- _ alluvial plain(H)
- X colluvium(I)
- _ moraine(J)
- _ flood plain(K)
- _ marsh(L)
- _ landslide/slump(M)
- _ delta(N)
- _ island(O)
- _ cliff(P)
- _ outcrop(Q)
- _ stream bed(R)

SECONDARY POSITION
- _ top/crest/ridge(A)
- _ edge(B)
- _ slope(C)
- _ toe/foot(D)
- _ cutbank(E)
- _ detached monolith(F)
- _ interior(G)
- _ step(H)
- _ riser(I)
- _ port.geo.feature(J)
- _ spring mound/bog(K)
- _ cave(L)
- _ alcove/shelter(M)
- _ patterned ground(N)

Description: The site is located at the head of the plain where it narrows at the canyon mouth and on the north base of a hill

30. Vegetation COMMUNITY and association (V/24-25):

_[illegible] GRASSLAND(AA)
_STRICT FIR(BB)
_aspen(BA)
_white fir-spruce(BB)
_STRICT DOUGLAS FIR(BC)
_limber pine(CA)
_douglas fir(CB)
_ponderosa pine(CC)
_bristlecone pine(CD)
_aspen(CE)
_streamside(CF)
_meadow grassland(CG)

_WILLOW FIRE-OAK(DA)
_ponderosa pine(DB)
_oakbrush(DD)
_mountain brush(DC)
_maple(DD)
_streamside(DE)

_FLATS/PRAIRIE(EA)
_grasslands(EB)
X pinyon-juniper(EC)
_streamside(ED)

_COLD DESERT SCRUB(FA)
_sagebrush(FA)
_small sagebrush(FB)
_little rabbitbrush(FC)
_shadscale(FD)
_horsebrush(FE)
_winter fat(FF)
_boy-sage/blkbrsh(FG)
_bud sagebrush(FH)
_mat saltbrush(FI)
_gray molly(FJ)
_streamside(FK)

_SALT DESERT SCRUB(GA)
_greasewood(GA)
_greywood-shadscl(GB)
_seepweed(GC)
_pickleweed/samphire(GD)
_saltgrass(GE)
_alkali sacaton(GF)
_rabbitbrush(GG)

_WARM DESERT SCRUB(H
_desert saltbrush(HA
_creosote bush(HB)
_creosote/bursage(HC
_joshua tree(HD)
_GRASS COMMUNITY(HE)

_ALKALI FLATS/MUD FLATS/DRY LAKE/ WASTELAND(HF)

_CULTIVATED LAND(JZ)

Description: pinyon, juniper, sage, Indian rice grass, serviceberry

31. Next nearest plant association/distance: unknown

32. Photograph Numbers (V/26): 496Q-1 (5) (lost in processing)

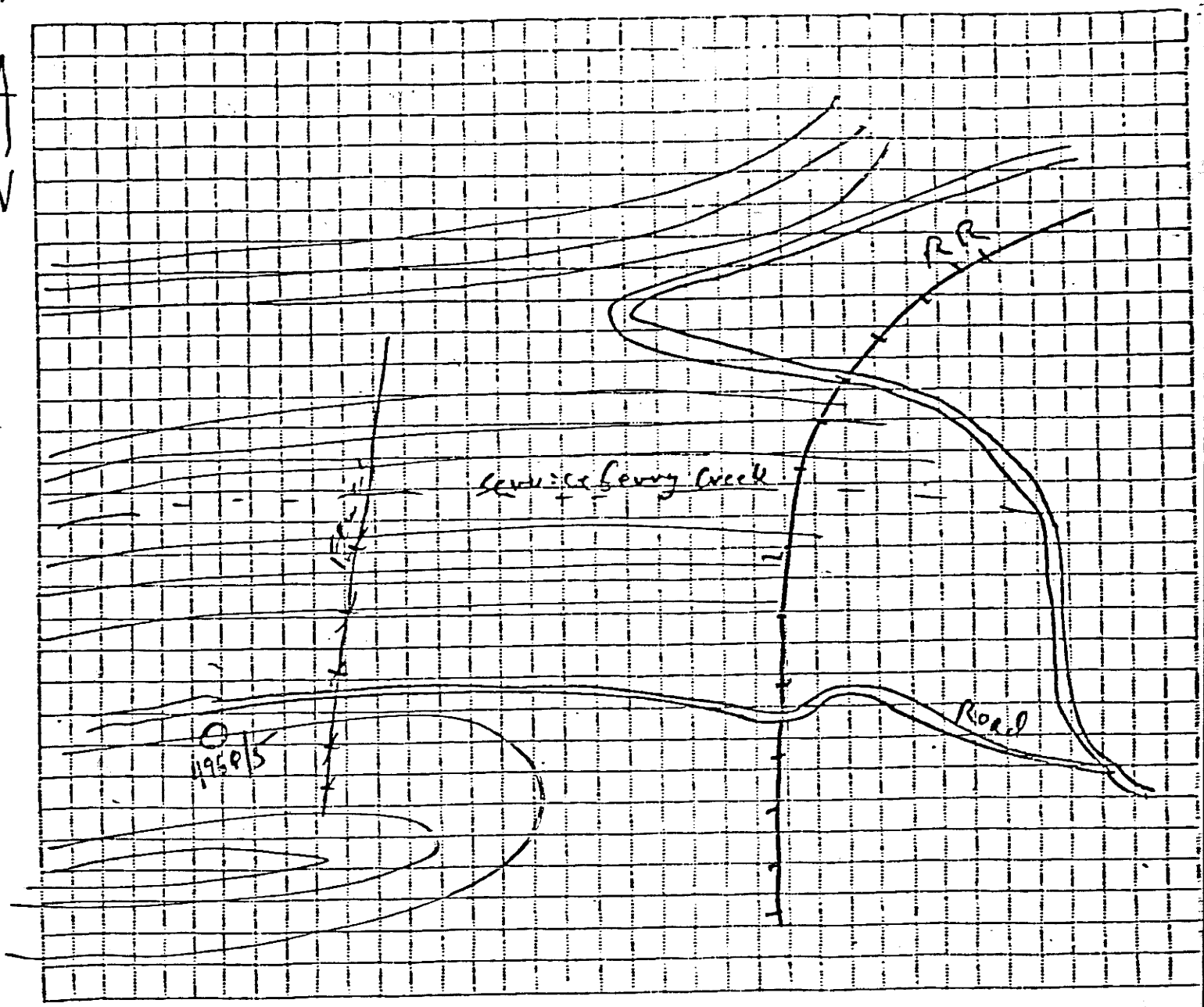
33. Recorded by: W. W. Carpenter

Survey Org. (V/27-28): AERC Date: 11/6/80

Assisting Crew Members: Michael Sloan, Mark Melendez, Robert Stevenson

34. Sponsoring Agency: Plateau Mining Company (PMC-80-1)

Contract No. NA



35. Encoding Form: (all entries are right justified)

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II	S	E	N	E	N	W	1	0	1	5		S	8		E	P	R	G	B	B		0	T								
III	A	A								A	A	A										R	A								
IV							2	2							A		1	2				A	Z	C	D	E	R				
V	D	9	9	9	0			2			B				Y	B	1		3		0			E	B	B	A	E			
VI																															

Form must be accompanied by a site map; photocopy of U.S.G.S. topo map with T., R., scale, and quad name; photographs of the site; and artifact sketches (if applicable).

Bureau of Land Management
Division of State History
University of Utah Archeological Center

2. County Carbon
3. Temp. No. 496Q/6

4. Class: ___ Prehistoric X Historic ___ Paleontologic
5. Cultural Site Type (interpreted function): camp and mine cart
6. Paleontological Site Type: __ Invertebrate; __ Vertebrate; __ Flora
7. Elevation (I/11-15) 7240 ft. X .3048= 2206.7 m.
elevation source: topographic map
8. UTM Grid: (I/16-30) zone 12 ; 499200 mE.; 4376350 mN.
9. (II/I-16) SE of NW of NE of Section 10 T. 15S., R. 8E.
10. Map Reference: Wattis, Utah USGS Series: 7.5' Date: 1979
11. Aerial Photo Data: NA
12. Site Location: The site is located on the east side of the railroad and south of the road on an open sage plain.

13. Land Owner (II/17-18): private
BLM District/Forest (II/19): NA
14. Site Name/Previous Designations: NA
15. Description of Site: The site is a small refuse dump; there is also a horse-drawn wooden mine cart.

16. Artifacts: Artifacts should be described/drawn on a continuation sheet and their locations plotted on the site map.

CLASS	QUANTITY
Debitage (II/30)	
Bifaces (III/1-9)	
Scrapers (III/1-9)	
Utilized Flakes	

CLASS	TYPE	QUANTITY
Ceramics (III/10-21)		
Proj Pnt (III/1-9)		
Gnd Stn (II/22-29)		
Glass (II/22-29)	purple	
Metal (II/22-29)		
Nails (II/22-29)		
Cans (II/22-29)	x	
Wood (II/22-29)	x	
Other (II/22-29)	mine cart	

Description: Remains (fair shape) of a horse-drawn oak ore cart

17. Non-Structural Features: (describe and locate on site map)(III/22-2

_hearth/firepit(HE)	_rubble mound(RM)	_earthen mound(EM)	_trail/road(TR)
X_midden(MD)	_stone circle(SC)	_burial(BU)	_RR grade(RG)
_depression(DE)	_rock alignment(RA)	_pictograph(PI)	_tram way/road(TW)
_water control(WC)	_mine tailings(MT)	_petroglyph(PE)	_other(OT)

Description: small pile of cans and glass

ATTACHMENT #1

Single rm			Tower		
Multiple rm			Cairn		
Granary			Corral		
Cist			Dugout		
Pithouse			Kiln		
Kiva			Monument		
Well			Mine		

Description: mine cart

19. Cultural Affiliation (IV/7-14) Euro-American

How Determined? Artifacts on site

20. Site Dimensions: 20 m.X 5 m; Area(IV/17-21) 100 sq m

21. Were surface artifacts collected? x Yes ___ No; (IV/22) If yes, attach a continuation sheet describing sampling method used. random

22. Estimated depth of fill (IV/23): 0

Subsurface test? ___ Yes; x No (Include location of test on site map

Description:

23. Site Condition (IV/25): ___ Excellent; x Good; ___ Fair; ___ Poor

Agent of Impact: erosion

24. Nat.Register Potential(V/1): x Significant(C); ___ Non-Significant(D)

Justification: CRRS:S-2; (cart only)

25. Research Potential: non-significant

26. Recommended Mitigation: salvage cart or avoidance

27. Direction/Distance to Permanent Water (V/5-10): 0 / 250 m

Type/Name of Water Source (V/11): Serviceberry Creek

Distance to nearest other Water Source (V/2-4): unknown

Type of other Water Source: unknown

Distance to Cultivatable Soil (V/12-14): 0 m.

28. Topographic Location (check one under each heading) (V/15-18)

PRIMARY LANDFORM
- _ mountain spine(A)
- _ hill/butte(B)
- _ tableland/mesa(C)
- _ ridge(D)
- _ valley(E)
- X plain(F)
- _ canyon(G)

POSITION ON LANDFORM
- _ top/crest/peak(A)
- X edge(B)
- _ slope(C)
- _ toe/foot/bottom(D)
- _ saddle/pass(E)
- _ bench/ledge(F)
- _ rimrock(G)
- _ interior(H)

DEPOSITIONAL ENVIRONMENT
- _ fan(A)
- _ talus(B)
- _ dune(C)
- _ stream terrace(D)
- _ playa(E)
- shore feature
  - _ extinct lake(F)
  - _ extant lake(G)
  - _ alluvial plain(H)
- X colluvium(I)
- _ moraine(J)
- _ flood plain(K)
- _ marsh(L)
- _ landslide/slump(M)
- _ delta(N)
- _ island(O)
- _ cliff(P)
- _ outcrop(Q)
- _ stream bed(R)

SECONDARY POSITION
- _ top/crest/ridge(A)
- _ edge(B)
- _ slope(C)
- _ toe/foot(D)
- _ cutbank(E)
- _ detached monolith(F)
- _ interior(G)
- _ step(H)
- _ riser(I)
- _ port.geo.feature(J)
- _ spring mound/bog(K)
- _ cave(L)
- _ alcove/shelter(M)
- _ patterned ground(N)

Description: a gullied plain

ATTACHMENT #1

Site No. 42Cb222 (1990/91)

30. Vegetation COMMUNITY and association (V/24-25):

_ALPINE GRASSLAND(AA)
_SPRUCE FIR(BB)
_aspenbole(BA)
_white fir-spruce(BB)
_MIXED DOUGLAS FIR(BC)
_limber pine(CA)
_douglas fir(CB)
_lodgepole pine(CC)
_bristlecone pine(CD)
_aspen(CE)
_streamside(CF)
_meadow grassland(CG)

_YELLOW PINE-OAK(DA)
_ponderosa pine(DA)
_oakbrush(DB)
_mountain brush(DC)
_maple(DD)
_streamside(DE)

_PLAINS/PRAIRIE(EA)
_grasslands(EA)
X_pinyon-juniper(EB)
_streamside(EC)

_COLD DESERT SCRUB(FA)
X_sagebrush(FA)
_small sagebrush(FB)
_little rabbitbrush(FC)
_shadscale(FD)
_horsebrush(FE)
_winter-fat(FF)
_hop-sage/blkbrush(FG)
_bud sagebrush(FH)
_mat saltbrush(FI)
_gray molly(FJ)
_streamside(FK)

_SALT DESERT SCRUB(GA)
_greasewood(GA)
_greasewood-shadscal(GB)
_sagewood(GC)
_pickleweed/samphire(GD)
_saltgrass(GE)
_alkali sacaton(GF)
_rabbitbrush(GG)

_WARM DESERT SCRUB(H
_desert saltbrush(HA
_creosote bush(HB)
_creosote/burrsage(HC
_joshua tree(HD)
_MARSH COMMUNITY(HA)

_ALKALI FLATS/MUD FLATS/DRY LAKE/ WASTELAND(HZ)

_CULTIVATED LAND(JZ)

Description: pinyon, juniper, sage, Indian rice grass

31. Next nearest plant association/distance: unknown

32. Photograph Numbers (V/26): 496Q-1 (6)

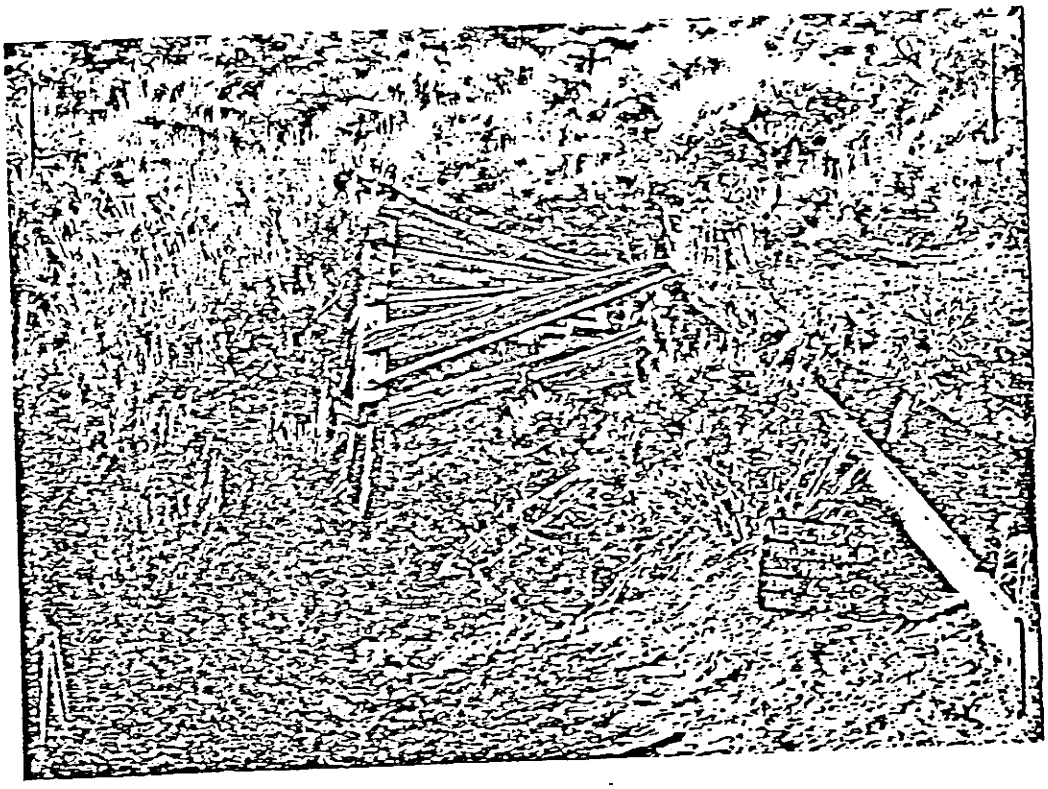
33. Recorded by: W. W. Carpenter

Survey Org. (V/27-28): AERC Date: 11/6/80

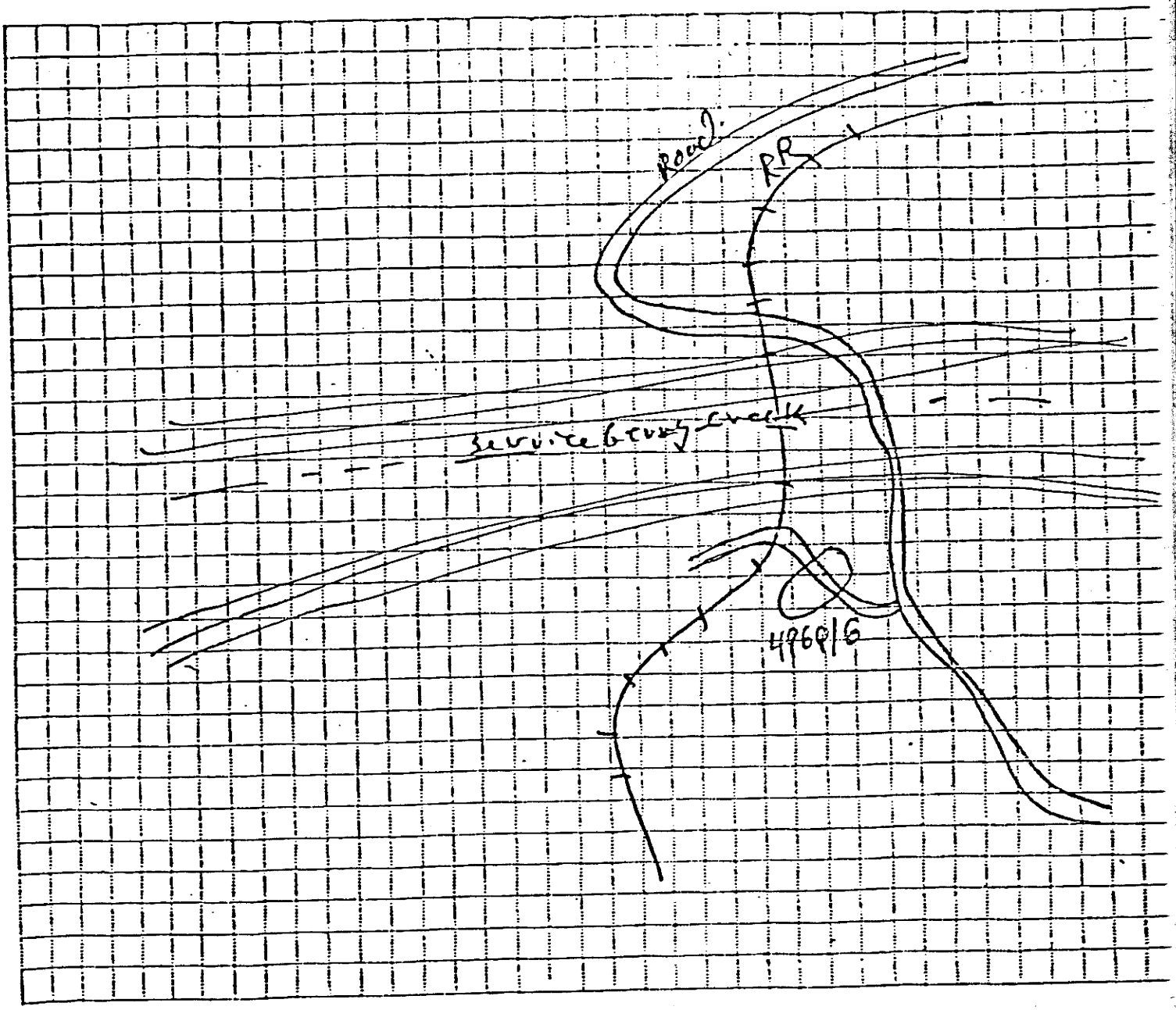
Assisting Crew Members: Michael Sloan, Mark Melendez, Robert Stevenson

34. Sponsoring Agency: Plateau Mining Company (PMC-80-1)

Contract No. NA



496Q/6



35. Encoding Form: (all entries are right justified)

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I	4	2	C	6	2	2	5				7	2	4	0		1	2	4	9	9	2	0	0	4	3	7	6	3	5	0	
II	S	E	N	W	N	E	1	0	1	5	S		8		E	P	R	6	B	B	G	L		O	T	M	M				
III																						M	D								
IV							E	A									1	0	0			B			B	E	R				
V	D	R			0			2			B	D			F	B	I		3		1	3	5	E	Z	B	A	E			
VI																															

Form must be accompanied by a site map; photocopy of U.S.G.S. topo map with T., R., scale, and quad name; photographs of the site; and artifact sketches (if applicable).

developed by cooperative agreement by:
Bureau of Land Management
Division of State History
University of Utah Archeological Center

1. Site No.(I/1-10) 42CB226
2. County Carbon
3. Temp. No. 496Q/7

4. Class: ___ Prehistoric x Historic ___ Paleontologic
5. Cultural Site Type (interpreted function): house foundation
6. Paleontological Site Type: __ Invertebrate; __ Vertebrate; __ Flora
7. Elevation (I/11-15) 7080 ft. X .3048= 2157.9 m.
   elevation source: topographic map
8. UTM Grid: (I/16-30) zone 12 ; 500250 mE.; 4375600 mN.
9. (II/I-16) SW of NE of SW of Section 11 T. 15S., R. 8E.
10. Map Reference: Pinnacle Peak, Utah USGS Series: 7.5' Date: 1972
11. Aerial Photo Data: NA
12. Site Location: The site is 100 feet north of the canyon rim on an open sage plain.

13. Land Owner (II/17-18): BLM
    BLM District/Forest (II/19): Moab
14. Site Name/Previous Designations: NA
15. Description of Site: The site is a 15 foot x 25 foot stone and mortar foundation. There are some pieces of purple glass and old stove parts on the site. No solder cans. There is a pit northwest of the foundation; another, south of the foundation, is 10 feet in from the lip of the canyon; and a third one is cut into the lip of the canyon.

16. Artifacts: Artifacts should be described/drawn on a continuation sheet and their locations plotted on the site map.

CLASS	QUANTITY
Debitage (II/30)	
Bifaces (III/1-9)	
Scrapers (III/1-9)	
Utilized Flakes	

CLASS	TYPE	QUANTITY
Ceramics (III/10-21)		
Proj Pnt (III/1-9)		
Gnd Stn (II/22-29)		
Glass (II/22-29)	purple, green, brown	
Metal (II/22-29)	stove	1
Nails (II/22-29)		
Cans (II/22-29)	yes	
Wood (II/22-29)		
Other (II/22-29)		

Description: artifacts are sparse -- some purple glass, no solder cans.

17. Non-Structural Features: (describe and locate on site map)(III/22-27)

_hearth/firepit(HE)	_rubble mound(RM)	_earthen mound(EM)	_trail/road(TR)
_midden(MD)	_stone circle(SC)	_burial(BU)	_RR grade(RG)
_depression(DE)	_rock alignment(RA)	_pictograph(PI)	_tram way/road(TW)
_water control(WC)	_mine tailings(MT)	_petroglyph(PE)	_other(OT)

Description: NA

ATTACHMENT #1

Site No. 42Cb226 (4969/7)

Single rm			Tower		
Multiple rm	concrete & stone foundation	1	Cairn		
Granary			Corral		
Cist			Dugout	X	1
Pithouse			Kiln		
Kiva			Monument		
Well			Mine		

Description: possible root cellars; also house foundation.

19. Cultural Affiliation (IV/7-14) Euro-American

How Determined? artifacts

20. Site Dimensions: 20 m.X 20 m; Area(IV/17-21) 400 sq m

21. Were surface artifacts collected? ___ Yes X No; (IV/22) If yes, attach a continuation sheet describing sampling method used.

22. Estimated depth of fill (IV/23): unknown

Subsurface test? ___ Yes; X No (Include location of test on site ma

Description:

23. Site Condition (IV/25): ___ Excellent; ___ Good; ___ Fair; X Poor

Agent of Impact: eroision

24. Nat.Register Potential(V/1): ___ Significant(C); X Non-Significant(D)

Justification: CRRS:S-2; there is little or no apparent depth on this site, but there are structural remains.

25. Research Potential: good

26. Recommended Mitigation: avoidance or pickup

27. Direction/Distance to Permanent Water (V/5-10): 180° / 100 m

Type/Name of Water Source (V/11): south fork of Serviceberry Cree

Distance to nearest other Water Source (V/2-4): unknown

Type of other Water Source: unknown

Distance to Cultivatable Soil (V/12-14): 1 meter

28. Topographic Location (check one under each heading) (V/15-18)

PRIMARY LANDFORM
- _ mountain spine(A)
- _ hill/butte(B)
- _ tableland/mesa(C)
- _ ridge(D)
- _ valley(E)
- X plain(F)
- _ canyon(G)

POSITION ON LANDFORM
- _ top/crest/peak(A)
- X edge(B)
- _ slope(C)
- _ toe/foot/bottom(D)
- _ saddle/pass(E)
- _ bench/ledge(F)
- _ rimrock(G)
- _ interior(H)

DEPOSITIONAL ENVIRONMENT
- _ fan(A)
- _ talus(B)
- _ dune(C)
- _ stream terrace(D)
- _ playa(E)
- shore feature
  - _ extinct lake(F)
  - _ extant lake(G)
- _ alluvial plain(H)
- X colluvium(I)
- _ moraine(J)
- _ flood plain(K)
- _ marsh(L)
- _ landslide/slump(M)
- _ delta(N)
- _ island(O)
- _ cliff(P)
- _ outcrop(Q)
- _ stream bed(R)

SECONDARY POSITION
- _ top/crest/ridge(A)
- _ edge(B)
- _ slope(C)
- _ toe/foot(D)
- _ cutbank(E)
- _ detached monolith(F)
- _ interior(G)
- _ step(H)
- _ riser(I)
- _ port.geo.feature(J)
- _ spring mound/bog(K)
- _ cave(L)
- _ alcove/shelter(M)
- _ patterned ground(N)

Description: The site is on a northeast-sloping plain about 200 feet north of a deep gully or canyon.

ATTACHMENT #1

29. Degree/Aspect of Slope (V/19-23):

30. Vegetation COMMUNITY and association (V/24-25):

_ALPINE GRASSLAND(AA)
_ALPINE FIR(AB)
_Krumholz(AA)
_White fir-spruce(AX)
_ASPEN DOUGLAS FIR(CC)
_Limber pine(CA)
_Douglas fir(CB)
_Ponderosa pine(CC)
_bristlecone pine(CD)
_aspen(CZ)
_Streamside(CD)
_Meadow grassland(CC)

_YELLOW PINE-OAK(DX)
_ponderosa pine(DA)
_oakbrush(DB)
_mountain brush(DC)
_maple(DD)
_streamside(DX)

_PLAINS/PRAIRIE(EE)
_grasslands(EA)
X pinyon-juniper(EB)
_streamside(EC)

_COLD DESERT SCRUB(FZ)
X sagebrush(FA)
_small sagebrush(FB)
_little rabbitbrush(FC)
_shadscale(FD)
_hornsbrush(FE)
_winter-fat(FF)
_hop-sage/blkbrush(FG)
_bud sagebrush(FH)
_mat saltbrush(FI)
_gray molly(FJ)
_streamside(FK)

_SALT DESERT SCRUB(GZ)
_greasewood(GA)
_greasewood-shadscal(GB)
_seepweed(GC)
_pickleweed/samphire(GD)
_saltgrass(GE)
_alkali sacaton(GF)
_rabbitbrush(GG)

_HOT DESERT SCRUB(H
_desert saltbrush(HA
_creosote bush(HB)
_creosote/burrsage(HC
_joshua tree(HD)
_MESQUITE COMMUNITY(HA)

_ALKALI FLATS/MUD FLATS/DRY LAKES/ WASTELAND(HE)

_CULTIVATED LAND(JZ)

Description: The site is situated on an open sagebrush plain with scattered pinyon and juniper which is thicker on the edges of the gullies (canyon edges).

31. Next nearest plant association/distance: unknown

32. Photograph Numbers (V/26): 496Q-1 (7)

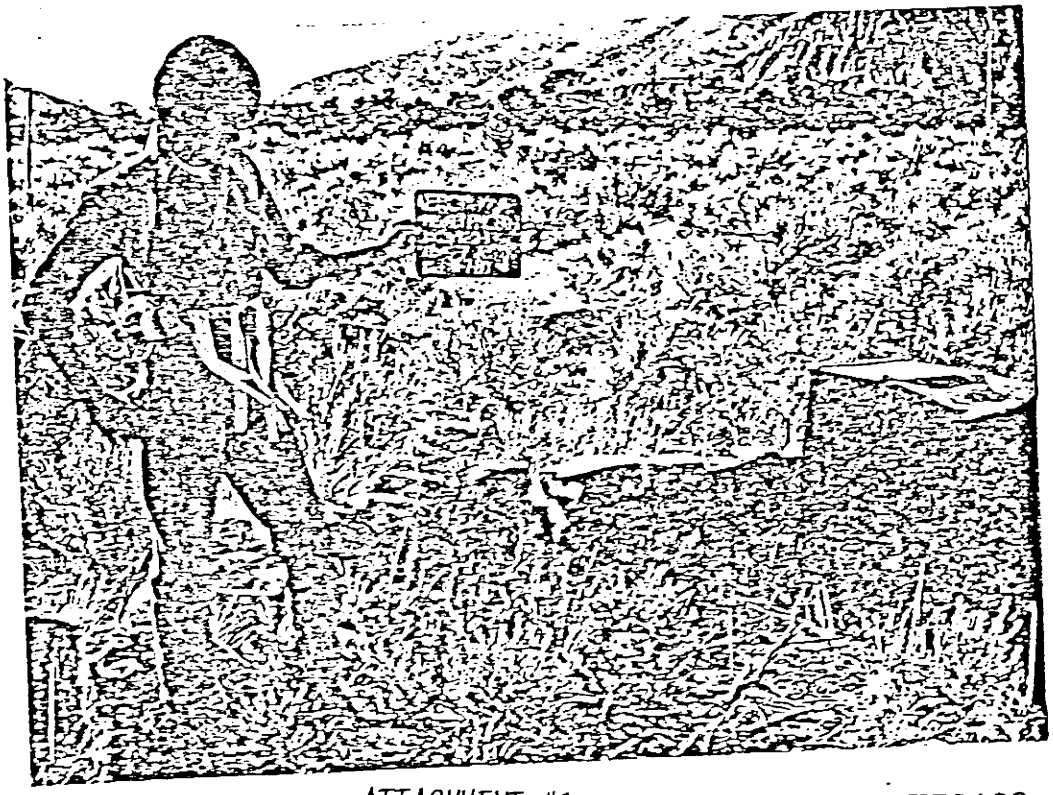
33. Recorded by: W. W. Carpenter

Survey Org. (V/27-28): AERC Date: 11/7/80

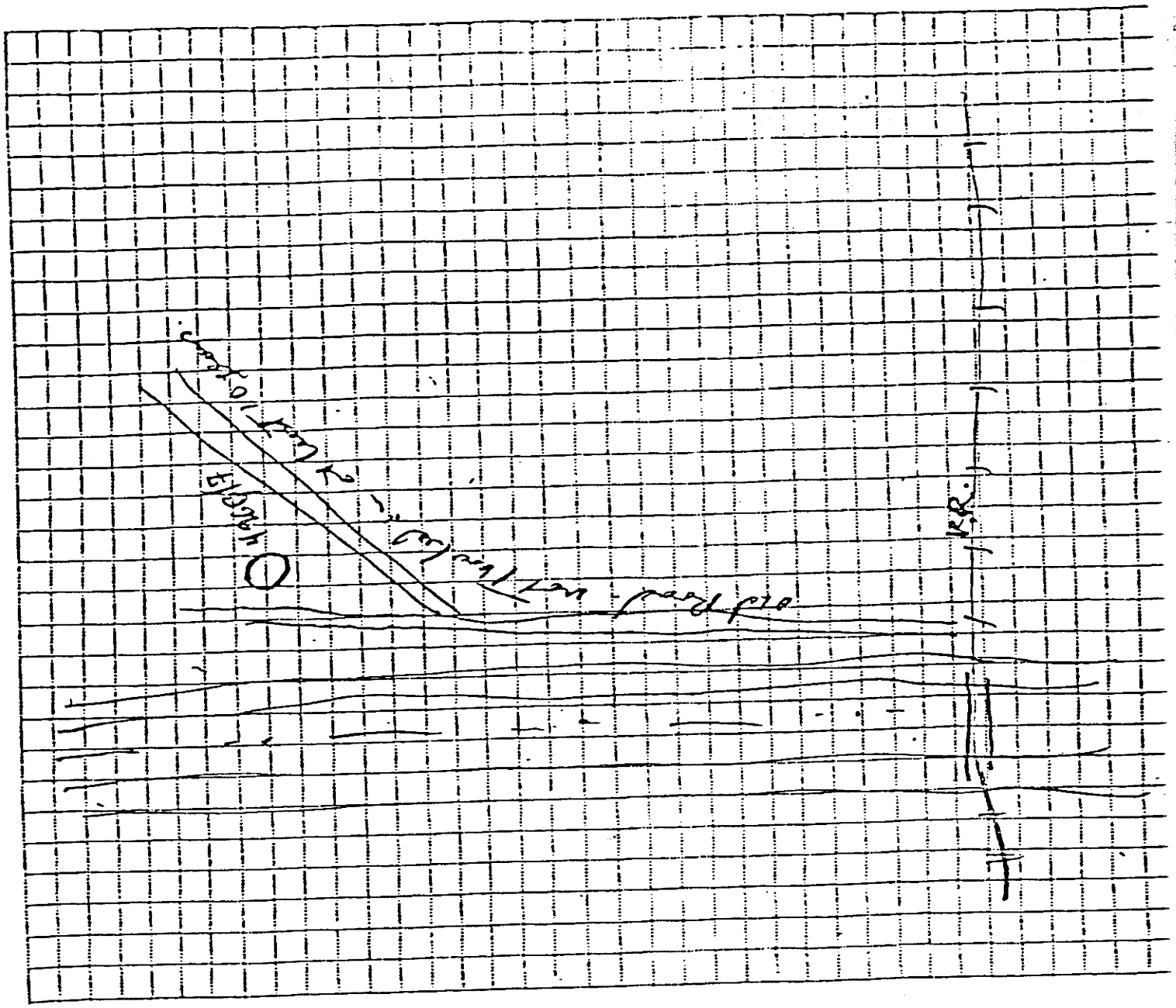
Assisting Crew Members: Mark Melendez, Michael Sloan, Robert Stevenson

34. Sponsoring Agency: Plateau Mining Company

Contract No. NA



ATTACHMENT #1



35. Encoding Form: (all entries are right justified)

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I	4	2	C	6	2	2	6				7	0	8	0		1	2	5	0	0	2	5	0	4	3	7	5	6	0	0	
II	S	W	N	E	S	W	1		1	5		5		8		E	L	A	6	B	B	G	L	H	T	C	N	O	T		
III																												1	I	K	
IV	F	B					E	A							G		4	0	0			B	E	C	D	E	R				
V	D	9	9	9	1	8	0	1				0			F	B	I		2		4	5		E	B	B	A	E			
VI																															

Form must be accompanied by a site map; photocopy of U.S.G.S. topo map with T., R., scale, and quad name; photographs of the site; and artifact sketches (if applicable).

Developed by cooperative agreement by:
Bureau of Land Management
Division of State History
University of Utah Archeological Center

2. County Carbon
3. Temp. No. 4960/8

4. Class: ___ Prehistoric x Historic ___ Paleontologic
5. Cultural Site Type (interpreted function): Historic house
6. Paleontological Site Type: __ Invertebrate; __ Vertebrate; __ Flora
7. Elevation (I/11-15) 7330 ft. X .3048= 2234 m.
elevation source: topographic map
8. UTM Grid: (I/16-30) zone 12 ; 499100 mE.; 4375700 mN.
9. (II/I-16) SW of NW of SE of Section 10 T. 15S., R. 8E.
10. Map Reference: Wattis, Utah USGS Series: 7.5' Date: 1979
11. Aerial Photo Data: NA
12. Site Location: The site is on an east-west ridge on the north bank of a deep gully.

13. Land Owner (II/17-18): Private
BLM District/Forest (II/19): NA
14. Site Name/Previous Designations: NA
15. Description of Site: The site is a historic stone and concrete foundation of pilings with garbage.

16. Artifacts: Artifacts should be described/drawn on a continuation sheet and their locations plotted on the site map.

CLASS	QUANTITY
Debitage (II/30)	
Bifaces (III/1-9)	
Scrapers (III/1-9)	
Utilized Flakes	

CLASS	TYPE	QUANTITY
Ceramics (III/10-21)	china	
Proj Pnt (III/1-9)		
Gnd Stn (II/22-29)		
Glass (II/22-29)	purple & green	
Metal (II/22-29)		
Nails (II/22-29)		
Cans (II/22-29)		
Wood (II/22-29)		
Other (II/22-29)	old car body	1

Description: The artifacts consist of the usual broken glass with an old car body about 1913-1918 vintage.

17. Non-Structural Features: (describe and locate on site map)(III/22-27)

_hearth/firepit(FE)	_rubble mound(RM)	_earthen mound(EM)	_trail/road(TR)
X midden(MD)	_stone circle(SC)	_burial(BU)	_RR grade(RG)
_depression(DE)	_rock alignment(RA)	_pictograph(PI)	_tram way/road(TW)
_water control(WC)	_mine tailings(MT)	_petroglyph(PE)	_other(OT)

Description:

ATTACHMENT #1

Site No. 42Cb227 (496Q/8)

CLASS	MATERIAL	QUANTITY	CLASS	MATERIAL	QUANTITY
Single rm			Tower		
Multiple rm	wood	1	Cairn		
Granary			Corral		
Cist			Dugout		
Pithouse			Kiln		
Kiva			Monument		
Well			Mine		

Description: 6 foundation pilings (stone and concrete)

19. Cultural Affiliation (IV/7-14) Euro-American

How Determined? Artifacts

20. Site Dimensions: 50 m. X 20 m; Area(IV/17-21) 1000 sq m

21. Were surface artifacts collected? x Yes ___ No; (IV/22) If yes, attach a continuation sheet describing sampling method used. random

22. Estimated depth of fill (IV/23): unknown

Subsurface test? ___ Yes; x No (Include location of test on site ma

Description:

23. Site Condition (IV/25): ___ Excellent; ___ Good; ___ Fair; x Poor

Agent of Impact: erosion

24. Nat.Register Potential(V/1): x Significant(C); ___ Non-Significant(D)

Justification: CRRS:S-2; structural remains present on this site.

25. Research Potential: good

26. Recommended Mitigation: avoidance or pickup

27. Direction/Distance to Permanent Water (V/5-10): 180° / 50 m

Type/Name of Water Source (V/11): south fork of Serviceberry Creek

Distance to nearest other Water Source (V/2-4): unknown

Type of other Water Source: unknown

Distance to Cultivatable Soil (V/12-14): 50 meters

28. Topographic Location (check one under each heading) (V/15-18)

PRIMARY LANDFORM
- _mountain spine(A)
- _hill/butte(B)
- _tableland/mesa(C)
- _ridge(D)
- _valley(E)
- X plain(F)
- _canyon(G)

POSITION ON LANDFORM
- _top/crest/peak(A)
- X edge(B)
- _slope(C)
- _toe/foot/bottom(D)
- _saddle/pass(E)
- _bench/ledge(F)
- _rimrock(G)
- _interior(H)

DEPOSITIONAL ENVIRONMENT
- _fan(A)
- _talus(B)
- _dune(C)
- _stream terrace(D)
- _playa(E)
- shore feature
  - _extinct lake(F)
  - _extant lake(G)
  - _alluvial plain(H)
- X colluvium(I)
- _moraine(J)
- _flood plain(K)
- _marsh(L)
- _landslide/slump(M)
- _delta(N)
- _island(O)
- _cliff(P)
- _outcrop(Q)
- _stream bed(R)

SECONDARY POSITION
- _top/crest/ridge(A)
- _edge(B)
- _slope(C)
- _toe/foot(D)
- _cutbank(E)
- _detached monolith(F)
- _interior(G)
- _step(H)
- _riser(I)
- _port.geo.feature(J)
- _spring mound/bog(K)
- _cave(L)
- _alcove/shelter(M)
- _patterned ground(N)

ATTACHMENT #1

Description: The site is on a ridge on the north edge of a deep drainage, with a broken plain sloping to the northeast.

30. Vegetation COMMUNITY and association (V/24-25):

_[illegible] GRASSLAND(AA)
_SPRUCE FIR(AB)
_[illegible]bolx(AA)
_[illegible]ite fir-spruce(AB)
_ASPEN DOUGLAS FIR(AC)
_limber pine(CA)
_[illegible]oglas fir(CB)
_[illegible]dgepole pine(CC)
_bristlecone pine(CD)
_aspen(CE)
_[illegible]eamside(CD)
_[illegible]dow grassland(CG)

_YELLOW PINE-OAK(DA)
_ponderosa pine(DA)
_oakbrush(DB)
_mountain brush(DC)
_maple(DD)
_streamside(DE)

_MEADOWS/PRAIRIES(EA)
_grasslands(EA)
X_pinyon-juniper(EB)
_streamside(EC)

_COLD DESERT SCRUB(FA)
X_sagebrush(FA)
_small sagebrush(FB)
_little rabbitbrush(FC)
_shadscale(FD)
_horsebrush(FE)
_winter-fat(FF)
_hop-sage/blkbrsh(FG)
_bud sagebrush(FH)
_mat saltbrush(FI)
_gray molly(FJ)
_streamside(FK)

_SALT DESERT SCRUB(GA)
_greasewood(GA)
_greasewood-shadscal(GB)
_seepweed(GC)
_pickleweed/samphire(GD)
_saltgrass(GE)
_alkali sacaton(GF)
_rabbitbrush(GG)

_HOT DESERT SCRUB(H
_desert saltbrush(HA
_creosote bush(HB)
_creosote/bursage(HC
_joshua tree(HD)
_MARSH COMMUNITY(HE)

_ALKALI FLATS/MUD FLATS/DRY LAKE/ WASTELAND(HE)

_CULTIVATED LAND(JA)

Description: pinyon, juniper, sage, serviceberry, Indian rice grass, rabbitbrush

31. Next nearest plant association/distance: unknown

32. Photograph Numbers (V/26): 496Q-1 (9-10)

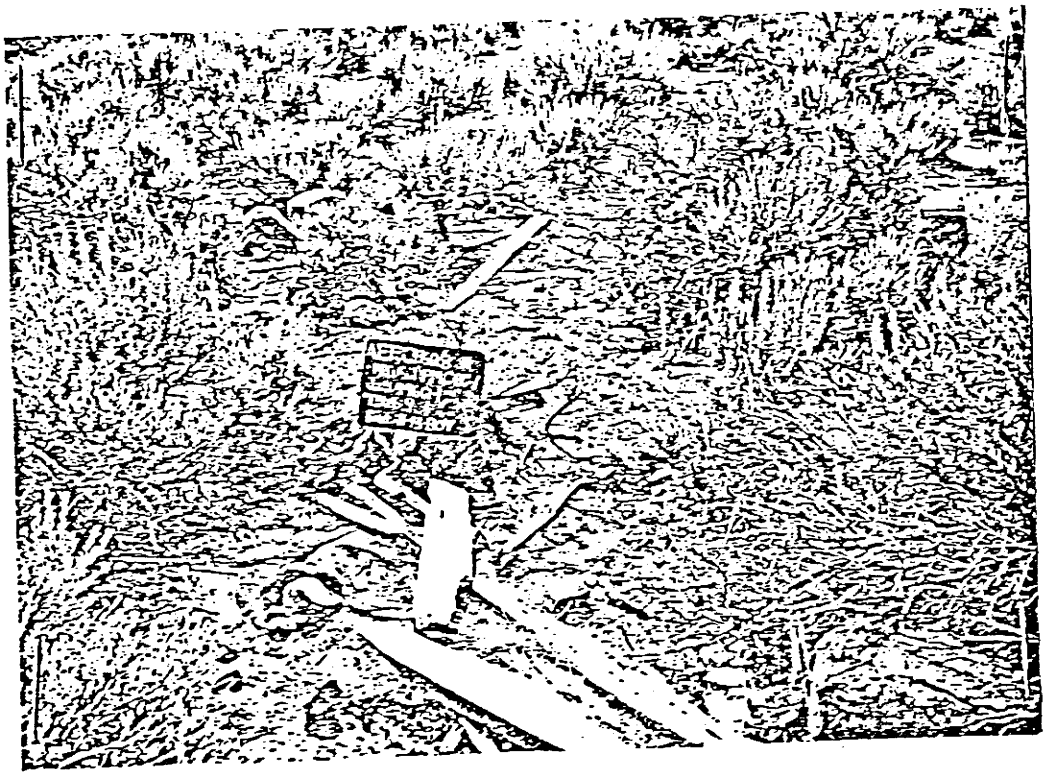
33. Recorded by: W. W. Carpenter

Survey Org. (V/27-28): AERC Date: 11/13/80

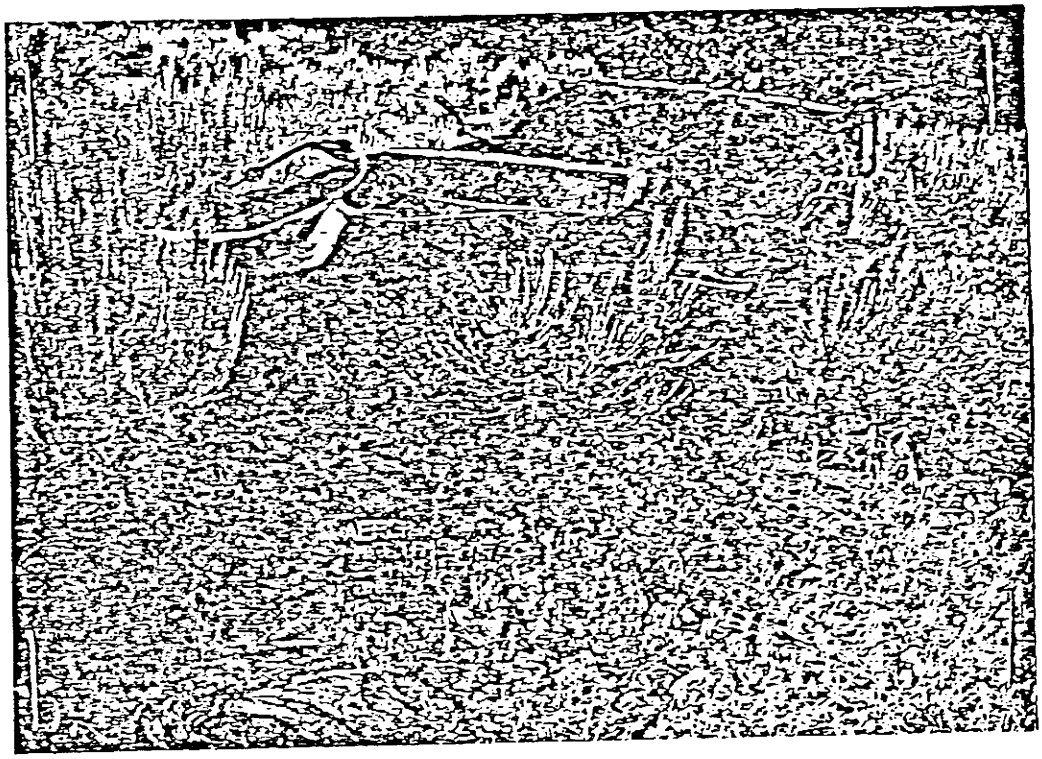
Assisting Crew Members: Michael Sloan, Mark Melendez, Robert Stevenson

34. Sponsoring Agency: Plateau Mining Company

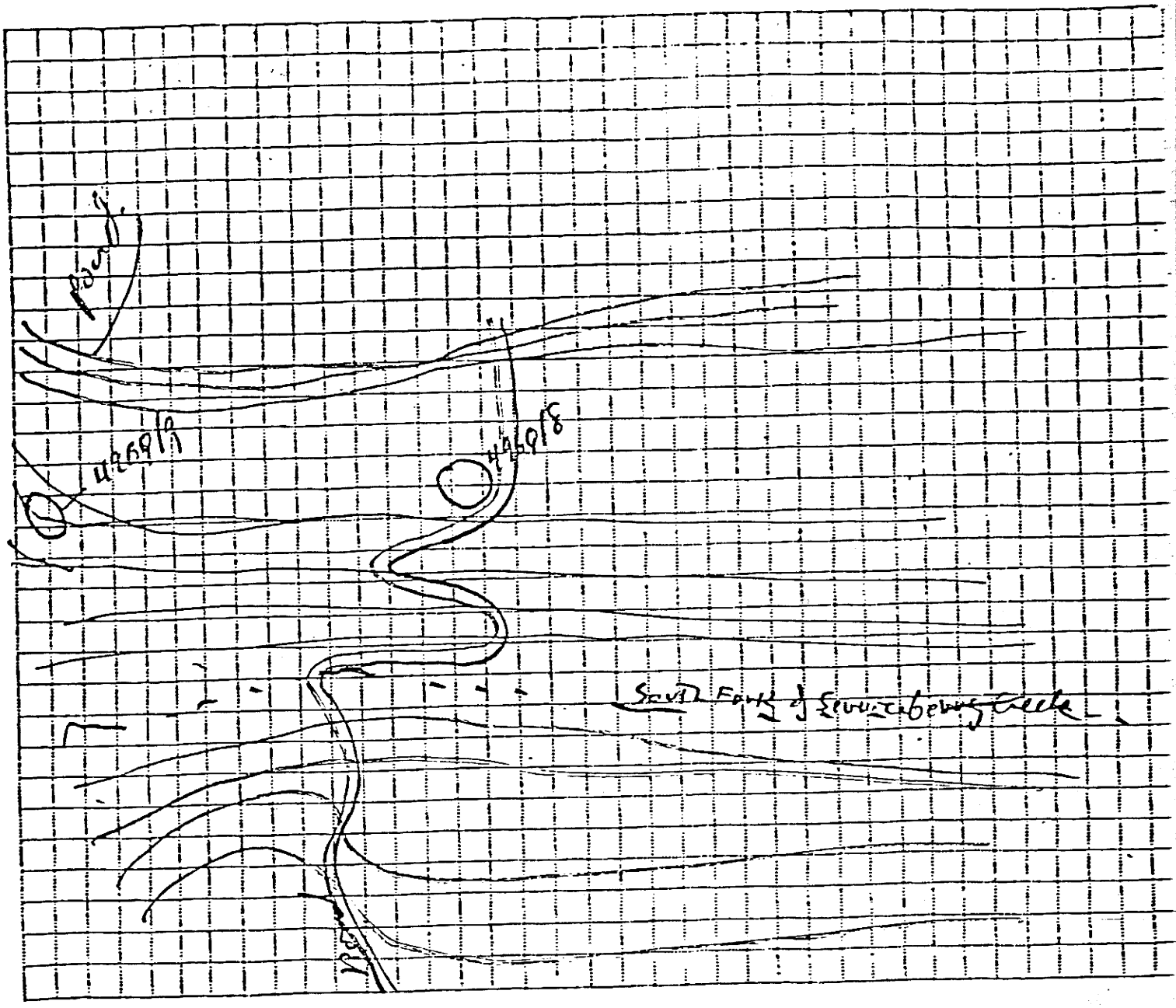
Contract No. NA



42Cb227
496Q/8
PMC-80-1
11/13/80



ATTACHMENT #1



35. Encoding Form: (all entries are right justified)

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I	4	2	0	6	2	2	7				7	3	3	0		1	2	4	9	9	1	0	0	4	3	7	5	7	0	0	
II	S	W	N	W	S	E	1	0	1	5		S		8		E	P	R	6	B	B	G	L	O	T						
III																						M	D					1	F	C	
IV							E	A									1	0	0	0		B	E	C	D	E	R				
V	D	9	9	9	1	8	0				B	1			F	B	I		4		2	2	5	E	B	B	A	E			
VI																															

Form must be accompanied by a site map; photocopy of U.S.G.S. topo map with T., R., scale, and quad name; photographs of the site; and artifact sketches (if applicable).

UTAH ANTIQUITIES SITE FORM
developed by cooperative agreement by:
Bureau of Land Management
Division of State History
University of Utah Archeological Center

1. Site No. (I/1-10) 42Cb228
2. County Carbon
3. Temp. No. 496Q/9

4. Class: ___ Prehistoric x Historic ___ Paleontologic
5. Cultural Site Type (interpreted function): possible powder magazine or root cellar
6. Paleontological Site Type: ___ Invertebrate; ___ Vertebrate; ___ Flora
7. Elevation (I/11-15) 7320 ft. X .3048= 2231 m.
   elevation source: topographic map
8. UTM Grid: (I/16-30) zone 12 ; 499050 mE.; 4375650 mN.
9. (II/I-16) SW of NW of SE of Section 10 T. 15S., R. 8E.
10. Map Reference: Wattis, Utah USGS Series: 7.5' Date: 1979
11. Aerial Photo Data: NA
12. Site Location: The site is on the north bank of the south fork of Serviceberry Creek about 20 feet below the top and facing SSW.

13. Land Owner (II/17-18): Private
    BLM District/Forest (II/19): NA
14. Site Name/Previous Designations: NA
15. Description of Site: The site contains a wooden structure 8'x10' dug into the Morrison clay bank. It has heavy timbers. There is no debitage.

16. Artifacts: Artifacts should be described/drawn on a continuation sheet and their locations plotted on the site map.

CLASS	QUANTITY
Debitage (II/30)	0
Bifaces (III/1-9)	
Scrapers (III/1-9)	
Utilized Flakes	

CLASS	TYPE	QUANTITY
Ceramics (III/10-21)		
Proj Pnt (III/1-9)		
Gnd Stn (II/22-29)		
Glass (II/22-29)		
Metal (II/22-29)		
Nails (II/22-29)	modern	
Cans (II/22-29)		
Wood (II/22-29)	beam & timbers	
Other (II/22-29)		

Description: Pole and plank construction

17. Non-Structural Features: (describe and locate on site map)(III/22-27

_hearth/firepit(HE)	_rubble mound(RM)	_earthen mound(EM)	_trail/road(TR)
_midden(MD)	_stone circle(SC)	_burial(BU)	_RR grad.(RG)
_depression(DE)	_rock alignment(RA)	_pictograph(PI)	_tram way/road(TW)
_water control(WC)	_mine tailings(MT)	_petroglyph(PE)	_other(OT)

Description: NA

ATTACHMENT #1

Site No. 42Cb228 (49CQ/9)

CLASS	MATERIAL	QUANTITY	CLASS	MATERIAL	QUANTITY
Single rm	wood	1	Tower		
Multiple rm			Cairn		
Granary			Corral		
Cist			Dugout		
Pithouse			Kiln		
Kiva			Monument		
Well			Mine		

Description: Pole and plank structure built into the side of the canyon just under the lip (about 20 feet below the rim).

19. Cultural Affiliation (IV/7-14) Euro-American

How Determined? construction

20. Site Dimensions: 4 m.X 4 m; Area(IV/17-21) 16 sq m

21. Were surface artifacts collected? ___Yes x No; (IV/22) If yes, attach a continuation sheet describing sampling method used.

22. Estimated depth of fill (IV/23): unknown

Subsurface test? ___Yes; x No (Include location of test on site ma

Description:

23. Site Condition (IV/25): ___Excellent; ___Good; ___Fair; x Poor

Agent of Impact: erosion

24. Nat.Register Potential(V/1): x Significant(C); ___Non-Significant(D)

Justification: CRRS:S-2; there is a structure.

25. Research Potential: low

26. Recommended Mitigation: avoidance or testing

27. Direction/Distance to Permanent Water (V/5-10): 180° / 20 m

Type/Name of Water Source (V/11): south fork of Serviceberry Creek

Distance to nearest other Water Source (V/2-4): unknown

Type of other Water Source: unknown

Distance to Cultivatable Soil (V/12-14): 200 meters

28. Topographic Location (check one under each heading) (V/15-18)

PRIMARY LANDFORM
- _mountain spine(A)
- _hill/butte(B)
- _tableland/mesa(C)
- _ridge(D)
- _valley(E)
- _plain(F)
- X canyon(G)

POSITION ON LANDFORM
- _top/crest/peak(A)
- _edge(B)
- X slope(C)
- _toe/foot/bottom(D)
- _saddle/pass(E)
- _bench/ledge(F)
- _rimrock(G)
- _interior(H)

DEPOSITIONAL ENVIRONMENT
- _fan(A)
- X talus(B)
- _dune(C)
- _stream terrace(D)
- _playa(E)
- shore feature
  - _extinct lake(F)
  - _extant lake(G)
- _alluvial plain(H)
- _colluvium(I)
- _moraine(J)
- _flood plain(K)
- _marsh(L)
- _landslide/slump(M)
- _delta(N)
- _island(O)
- _cliff(P)
- _outcrop(Q)
- _stream bed(R)

SECONDARY POSITION
- _top/crest/ridge(A)
- _edge(B)
- _slope(C)
- _toe/foot(D)
- _cutbank(E)
- _detached monolith(F)
- _interior(G)
- _step(H)
- _riser(I)
- _port.geo.feature(J)
- _spring mound/bog(K)
- _cave(L)
- _alcove/shelter(M)
- _patterned ground(N)

Description: The site is on the south-facing north slope of a

ATTACHMENT #1

29. Degree/Aspect of slope (V/19-23): 60°/360°

30. Vegetation COMMUNITY and association (V/24-25):

_ALPINE GRASSLAND(AA)	_YELLOW PINE-OAK(DZ)	_COLD DESERT SCRUB(FZ)	_SALT DESERT SCRUB(GZ)	_HOT DESERT SCRUB(H
	_ponderosa pine(DA)	_sagebrush(FA)	_greasewood(GA)	_desert saltbrush(HA
_SPRUCE FIR(BZ)	_oakbrush(DB)	_small sagebrush(FB)	_greasewood-shadscale(GB)	_creosote bush(HB)
_krumholz(BA)	_mountain brush(DC)	_little rabbitbrush(FC)	_seepweed(GC)	_creosote/bursage(HC
_white fir-spruce(BB)	_maple(DD)	_shadscale(FD)	_pickleweed/samphire(GD)	_joshua tree(HD)
_ASPEN DOUGLAS FIR(BC)	_streamside(DZ)	_bonsebrush(FE)	_saltgrass(GE)	_MARSH COMMUNITY(HA)
_limber pine(CA)		_winter-fat(FF)	_alkali sacaton(GF)	
_douglas fir(CB)		_hop-sage/blkbrush(FG)	_rabbitbrush(GG)	_ALKALI FLATS/MUD FLATS/DRY LAKE/ WASTELAND(HZ)
_lodgepole pine(CC)	_PLATEAUS/PRAIRIE(EZ)	_bud sagebrush(FH)		
_bristlecone pine(CD)	_grasslands(EA)	_mat saltbrush(FI)		
_aspen(CE)	X_pinyon-juniper(EB)	_gray molly(FJ)		_CULTIVATED LAND(JZ)
_streamside(CD)	_streamside(EC)	_streamside(FK)		
_meadow grassland(CE)				

Site No. 46U628 (4 of 7)

Description: pinyon, juniper, galeta grass, wheat grass.

31. Next nearest plant association/distance: sage, 200 meters east

32. Photograph Numbers (V/26): 496Q-1 (11)

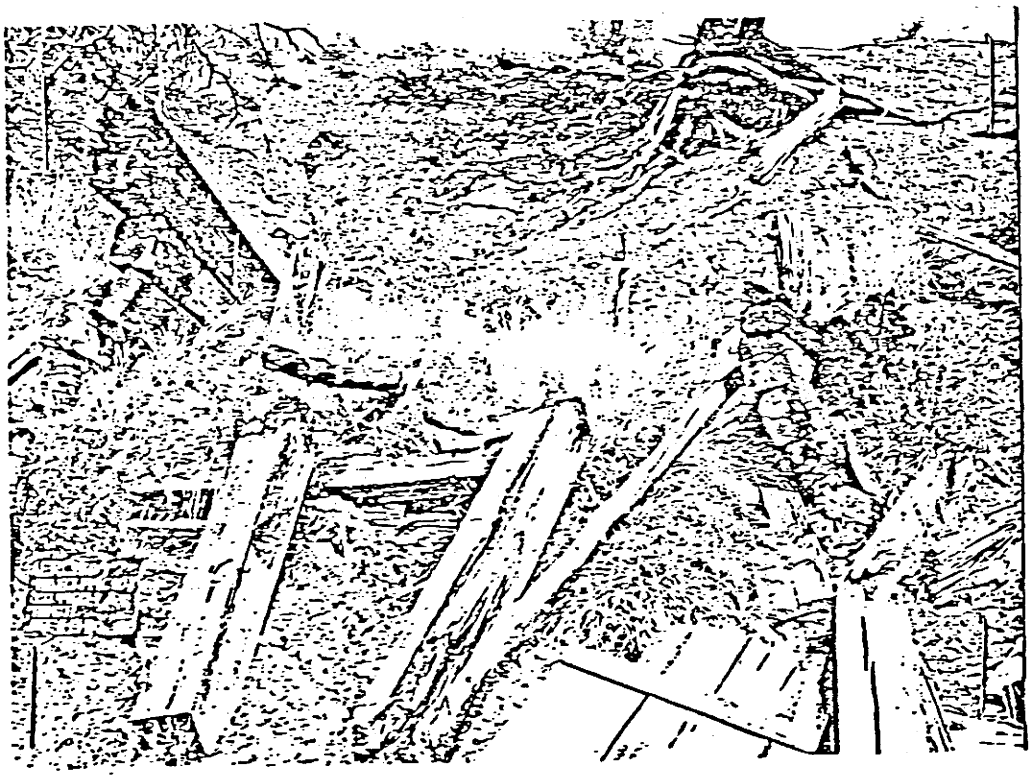
33. Recorded by: W. W. Carpenter

Survey Org. (V/27-28): AERC Date: 11/13/80

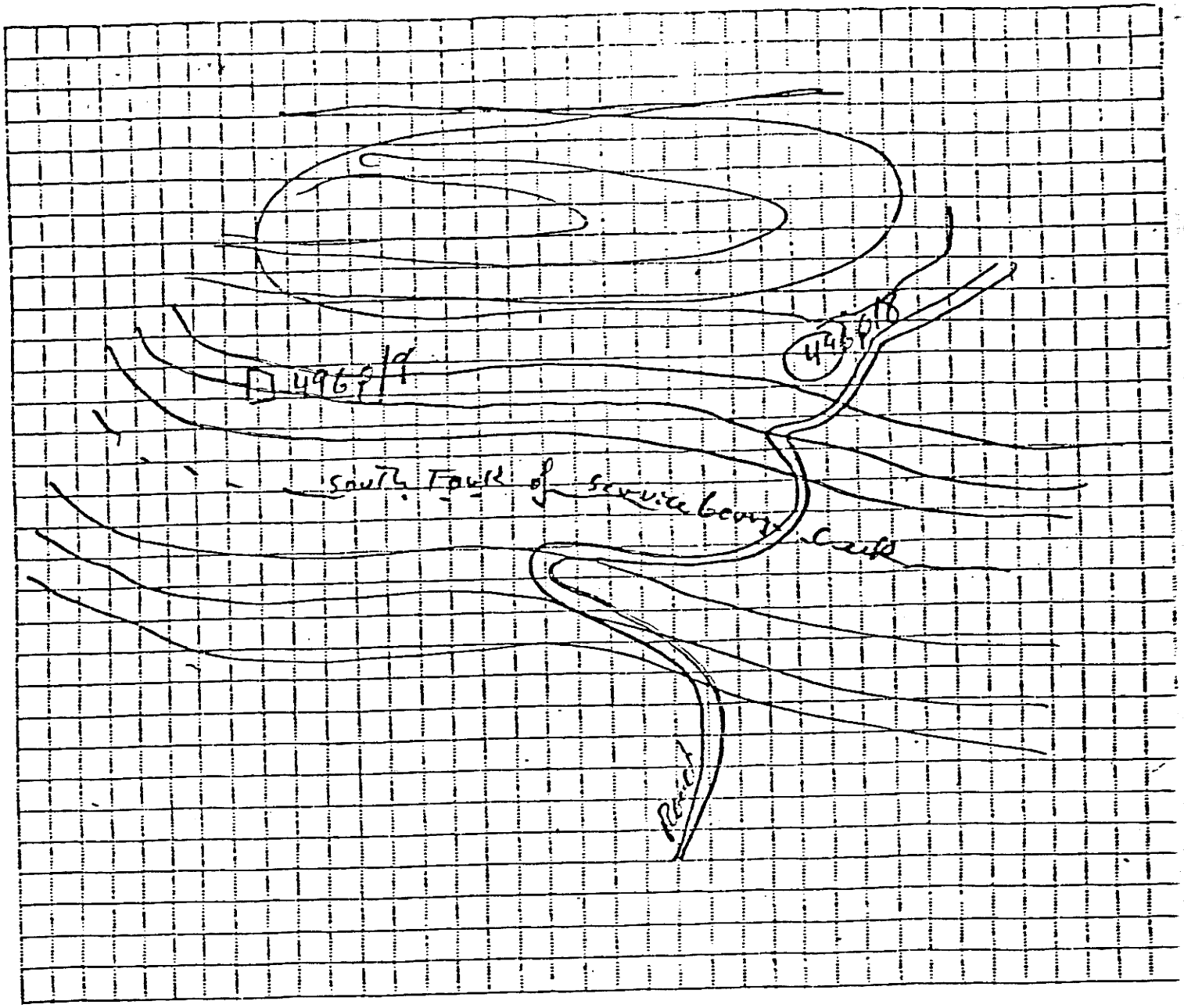
Assisting Crew Members: Michael Sloan, Mark Melendez, Robert Stevenson

34. Sponsoring Agency: Plateau Mining Company

Contract No. NA



ATTACHMENT #1



35. Encoding Form: (all entries are right justified)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
I	4	2	C	6	2	2	8				7	3	2	0		1	2	4	9	9	0	5	0	4	3	7	5	6	5	0	
II	S	W	N	W	S	E	1	0	1	5	S		8		E	P	R	6	B	B	N	A									
III																												1	C	B	
IV								B	A								1	6				B	E	C	D	E	R			
V	D	9	9	9	1	8	P	0			B	2			C	C	B		6	0	3	6	0	E	B	B	A	E			
VI																															

Form must be accompanied by a site map; photocopy of U.S.G.S. topo map with T., R., scale, and quad name; photographs of the site; and artifact sketches (if applicable).

Utah Antiquities Site Form
developed by cooperative agreement by:
Bureau of Land Management
Division of State History
University of Utah Archeological Center

1. Site No.(I/1-10) 42Cb229
2. County Carbon
3. Temp. No. 4960/10

4. Class: ___ Prehistoric X Historic ___ Paleontologic
5. Cultural Site Type (interpreted function): Prospect hole
6. Paleontological Site Type: __ Invertebrate; __ Vertebrate; __ Flora
7. Elevation (I/11-15) 7250 ft. X .3048= 2209 m.
   elevation source: topographic map
8. UTM Grid: (I/16-30) zone 12 ; 499200 mE.; 4376000 mN.
9. (II/I-16) SE of SW of NE of Section 10 T. 15S. , R. 8E.
10. Map Reference: Wattis, Utah USGS Series: 7.5' Date: 1979
11. Aerial Photo Data: NA
12. Site Location: The site is on an ESE finger of land near the bottom of the slope.

13. Land Owner (II/17-18): Private
    BLM District/Forest (II/19): NA
14. Site Name/Previous Designations: NA
15. Description of Site: The site is an 8'x8' prospect hole, straight down, through the shale. Depth is unknown and probably not over 10-12 feet.

16. Artifacts: Artifacts should be described/drawn on a continuation sheet and their locations plotted on the site map.

CLASS	QUANTITY
Debitage (II/30)	
Bifaces (III/1-9)	
Scrapers (III/1-9)	
Utilized Flakes	

CLASS	TYPE	QUANTITY
Ceramics (III/10-21)		
Proj Pnt (III/1-9)		
Gnd Stn (II/22-29)		
Glass (II/22-29)		
Metal (II/22-29)		
Nails (II/22-29)		
Cans (II/22-29)		
Wood (II/22-29)	ladder	1
Other (II/22-29)		

Description: Old ladder embedded in erosion-filled prospect hole.

17. Non-Structural Features: (describe and locate on site map)(III/22-2

_hearth/firepit(HE)	_rubble mound(RM)	_earthen mound(EM)	_trail/road(TR)
_midden(MD)	_stone circle(SC)	_burial(BU)	_RR grade(RG)
_depression(DE)	_rock alignment(RA)	_pictograph(PI)	_tram way/road(TW)
_water control(WC)	X_mine tailings(MT)	_petroglyph(PE)	_other(OT)

Description: Small pile of tailings from opening of prospect hole.

ATTACHMENT #1

Site No. 42CB229 (496Q/10)

CLASS	MATERIAL	QUANTITY	CLASS	MATERIAL	QUANTITY
Single rm			Tower		
Multiple rm			Cairn		
Granary			Corral		
Cist			Dugout		
Pithouse			Kiln		
Kiva			Monument		
Well			Mine	unknown	

Description: prospect hole 8' x 8'

19. Cultural Affiliation (IV/7-14) Euro-American

How Determined? artifacts

20. Site Dimensions: 10 m.X 10 m; Area(IV/17-21) 100 sq m

21. Were surface artifacts collected? ___Yes x No; (IV/22) If yes, attach a continuation sheet describing sampling method used.

22. Estimated depth of fill (IV/23): unknown

Subsurface test? ___Yes; x No (Include location of test on site ma

Description:

23. Site Condition (IV/25): ___Excellent; ___Good; ___Fair; x Poor

Agent of Impact: erosion

24. Nat.Register Potential(V/1): x Significant(C); ___Non-Significant(D)

Justification: CRRS:S-3; mine structure on site

25. Research Potential: low

26. Recommended Mitigation: avoidance or testing

27. Direction/Distance to Permanent Water (V/5-10): 180° / 400 m

Type/Name of Water Source (V/11): South fork of Serviceberry Creek

Distance to nearest other Water Source (V/2-4): unknown

Type of other Water Source: unknown

Distance to Cultivatable Soil (V/12-14): unknown

28. Topographic Location (check one under each heading) (V/15-18)

PRIMARY LANDFORM
- _mountain spine(A)
- _hill/butte(B)
- _tableland/mesa(C)
- _ridge(D)
- X_valley(E)
- _plain(F)
- _canyon(G)

POSITION ON LANDFORM
- _top/crest/peak(A)
- _edge(B)
- X_slope(C)
- _toe/foot/bottom(D)
- _saddle/pass(E)
- _bench/ledge(F)
- _rimrock(G)
- _interior(H)

DEPOSITIONAL ENVIRONMENT
- _fan(A)
- _talus(B)
- _dune(C)
- _stream terrace(D)
- _playa(E)
- shore feature
  - _extinct lake(F)
  - _extant lake(G)
  - _alluvial plain(H)
- X_colluvium(I)
- _moraine(J)
- _flood plain(K)
- _marsh(L)
- _landslide/slump(M)
- _delta(N)
- _island(O)
- _cliff(P)
- _outcrop(Q)
- _stream bed(R)

SECONDARY POSITION
- _top/crest/ridge(A)
- _edge(B)
- _slope(C)
- _toe/foot(D)
- _cutbank(E)
- _detached monolith(F)
- _interior(G)
- _step(H)
- _riser(I)
- _port.geo.feature(J)
- _spring mound/bog(K)
- _cave(L)
- _alcove/shelter(M)
- _patterned ground(N)

ATTACHMENT #1

Description: The site is on an ESE-facing finger of land on

30. Vegetation COMMUNITY and association (V/24-25):

_GRASSLAND(AA)	_YELLOW PINE-OAK(DZ)	_COLD DESERT SCRUB(FZ)	_SALT DESERT SCRUB(GZ)	_HOT DESERT SCRUB(H
	_ponderosa pine(DA)	_sagebrush(FA)	_greasewood(GA)	_desert saltbrush(HA)
_SPRUCE FIR(BZ)	_oakbrush(DB)	_small sagebrush(FB)	_greasewood-shadscal(GB)	_creosote bush(HB)
_aspenholz(BA)	_mountain brush(DC)	_little rabbitbrush(FC)	_saltbush(GC)	_creosote/burrsage(HC)
_white fir-spruce(BB)	_maple(DD)	_shadscale(FD)	_pickleweed/samphire(GD)	_joshua tree(HD)
_ASPEN DOUGLAS FIR(BC)	_streamside(DE)	_horsebrush(FE)	_saltgrass(GE)	_MESQUITE COMMUNITY(HE)
_limber pine(CA)		_winterfat(FF)	_alkali sacaton(GF)	
_douglas fir(CB)		_bog-sage/blkbrsh(FG)	_rabbitbrush(GG)	_ALKALI FLATS/MUD FLATS/DRY LAKE/ WASTELAND(HZ)
_lodgepole pine(CC)	_PLAINS/PRAIRIE(EZ)	_bud sagebrush(FH)		
_bristlecone pine(CD)	_grasslands(EA)	_hat saltbrush(FI)		
_aspen(CE)	X_pinyon-juniper(EB)	_gray molly(FJ)		_CULTIVATED LAND(JZ)
_streamside(CF)	_streamside(EC)	_streamside(FK)		
_meadow grassland(CG)				

Description: pinyon, juniper, sage, wheat grass, galeta grass, Indian rice grass, narrow leaf yucca, serviceberry

31. Next nearest plant association/distance: unknown

32. Photograph Numbers (V/26): 496Q-1 (12)

33. Recorded by: W. W. Carpenter

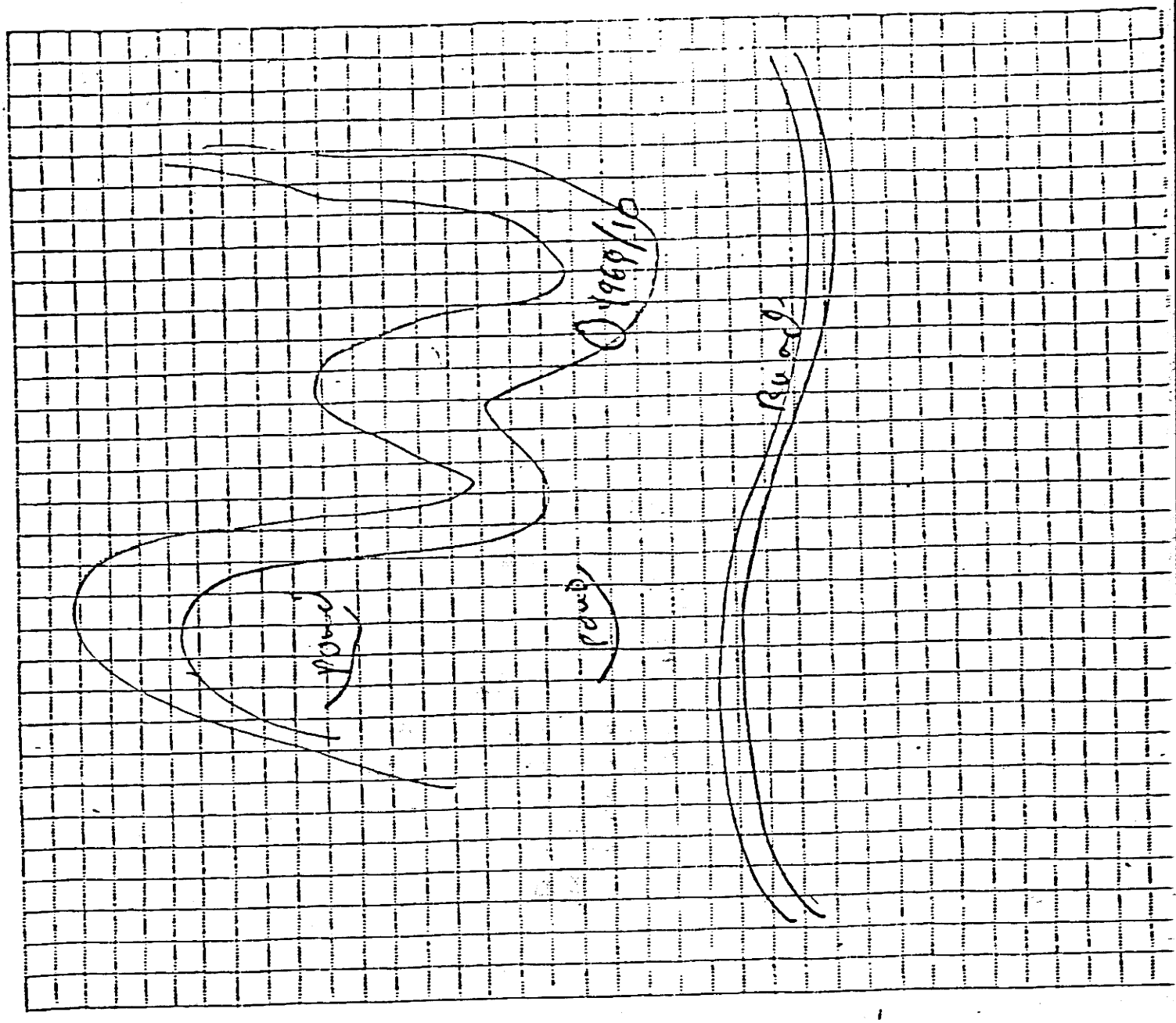
Survey Org. (V/27-28): AERC Date: 11/13/80

Assisting Crew Members: Michael Sloan, Mark Melendez, Robert Stevenson

34. Sponsoring Agency: Plateau Mining Company

Contract No. NA

SITE NO. 42 Cb 229
496Q/10



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II	S	E	S	W	N	E	1	0	1	5	5		8		E	P	R	6	B	B	M	M									
III																						M	T					1		N	
IV							E	A									1	0	0			A	E	C	D	E	R				
V	D	9	9	9	8	0		4			B	0			E	C	I		6		1	3	5	E	B	B	A	E			
VI																															

Form must be accompanied by a site map; photocopy of U.S.G.S. topo map with T., R., scale, and quad name; photographs of the site; and artifact sketches (if applicable).

ATTACHMENT #1

HISTORY OF WATTIS

Proposed insert Volume II Pages 5-35 Third Paragraph end of last sentence "on flank of Castle Valley Mountain.

"Mining operations began in 1916 when the Wattis brothers and Mr. Browning bought 160 acres from the United States and took steps to open the property for production. Coal was not shipped until the autumn of 1917 at which time the railroad was completed. The camp was named for W.H. Wattis who sold the Wattis interests to the Lion Coal Company in 1919.

During the time of World War II and immediately thereafter, when the demand for coal was at its peak, the camp increased its output and put many more men to work. Housing accommodations, which had been somewhat inadequate up to this time, were increased by building the "Wattis Villa" apartments to house the miners and their families. The old boarding house, where many of the men stayed in times past, had been condemned." [Subsequently removed over 20 years ago].

"In spite of the heavy grade and rather a long distance to Price, many miners lived in the valley and commuted to their work thus increasing the number who worked there but not being reflected in the size of the camp. Although Wattis is not considered a large camp, it is a big factor in [1] coal production in the Carbon area."

The preceding is a direct quote from "Centennial Echos" and is the most extensive history of the camp of Wattis. Additional input has been gathered by personal interviews with people who lived and worked at Wattis.

At its peak, the camp of Wattis boasted a population of over three hundred. It had two boarding houses, over forty residences, two amusement houses, a post office and a school plus all those buildings and offices necessary to operate a mine. The Company maintained a small diner and there were always atleast two bars functioning during this time. A doctor was on staff during the peak years and then later, on a part time basis, until 1964 when the mine was closed.

ATTACHMENT #1

Not unlike many towns in Carbon and Emery Countys today, Wattis was plagued with a culinary water shortage and the innovative miners devised several solutions; perhaps the most satisfactory was the installation of a hidden water line tapping the spring house of their nearby community of Hiawatha. This solution proved satisfactory until the town folk of Hiawatha discovered it and proceeded to dynamite the line and the Wattis spring house. This resulted in a court case which Wattis lost. The next solution involved a plan to increase their existing spring flow by introducing mud puppys into the spring house. Apparently this type of Salamander digs tunnels back into the mud to hibernate in the Winter - the end result being more water is tapped. The spring reportedly doubled its output the first year.

It appears that not only the town's people but the mine as well was innovative. Wattis was the first mine to join the union; first to use loading machines and the first to try out a continuous miner. It also boasted the fastest rope tram in the world.

As the demand for coal decreased at the end of World War II, the town of Wattis began its decline. By the mid-50s there was but a hand full of the homes occupied - the large numbers of miners were no longer needed. As the last of the coal was taken from the leased ground, no new leases were applied for and the mine was shut down in 1963.

The ground and salvage rights were sold to Mountain States Machinery who proceeded to tear down the existing buildings or sell them with a stipulation they be removed from the property.

In 1967 Plateau Limited opened a new mine in the Hiawatha coal seam. In 1971 United Nuclear purchased the mine and in July of 1980 the present owner bought it.

There is very little left of the town of Wattis. The old union hall has been converted and remodeled into the lower office. A portion of the "Wattis Villa" is being used for storage and shop area and the concrete foundation of the boarding house has been converted into the old shower house.

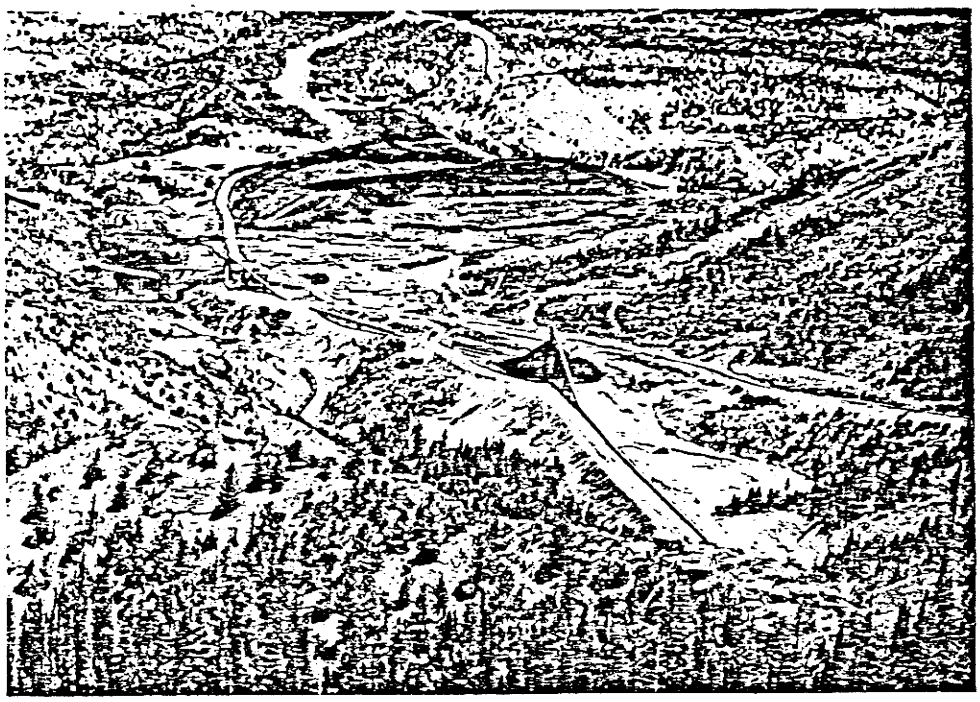
Though the town of Wattis is gone, the period is well preserved in a number of other "coal camps" which exist throughout Carbon County.

BIBLIOGRAPHY

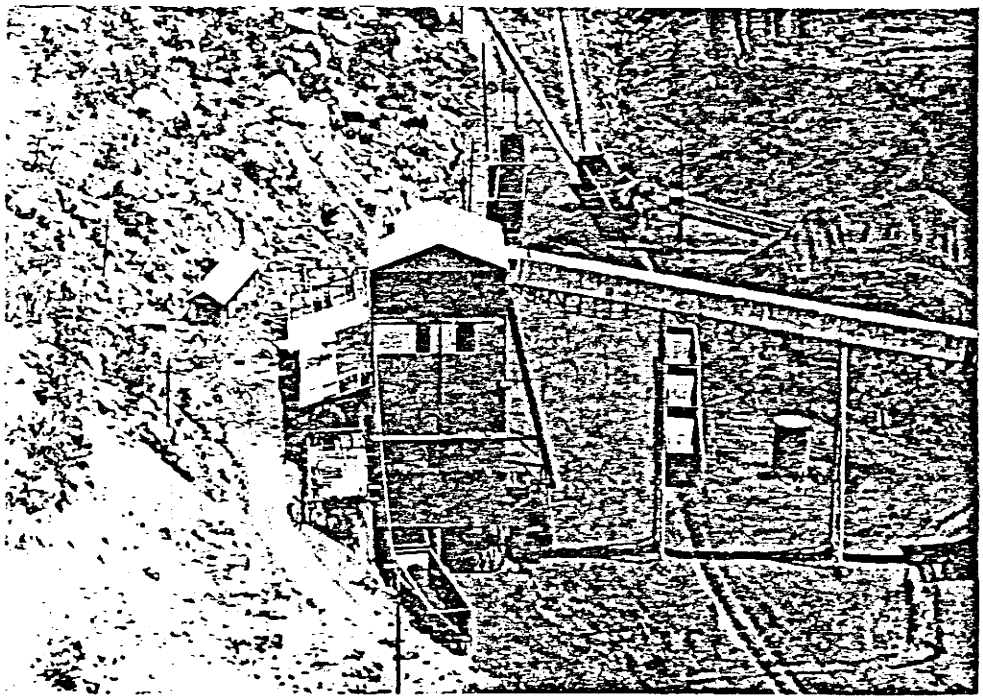
1. Centennial Echos from Carbon County.
from History compiled by C.H. Madsen
compiled by Thursey Jessen Reynolds
published by Daughters of Utah Pioneers of Carbon County 1948

Personal interviews:
Ernal Shaw - employee - Plateau Mining Company
Mr. & Mrs. Thilmer Jewkes - retired - Spring Glen, Utah
Mr. & Mrs. William O'Brien - contractor - Kennilworth, Utah

SUPPLEMENT TO HISTORY OF WATTIS

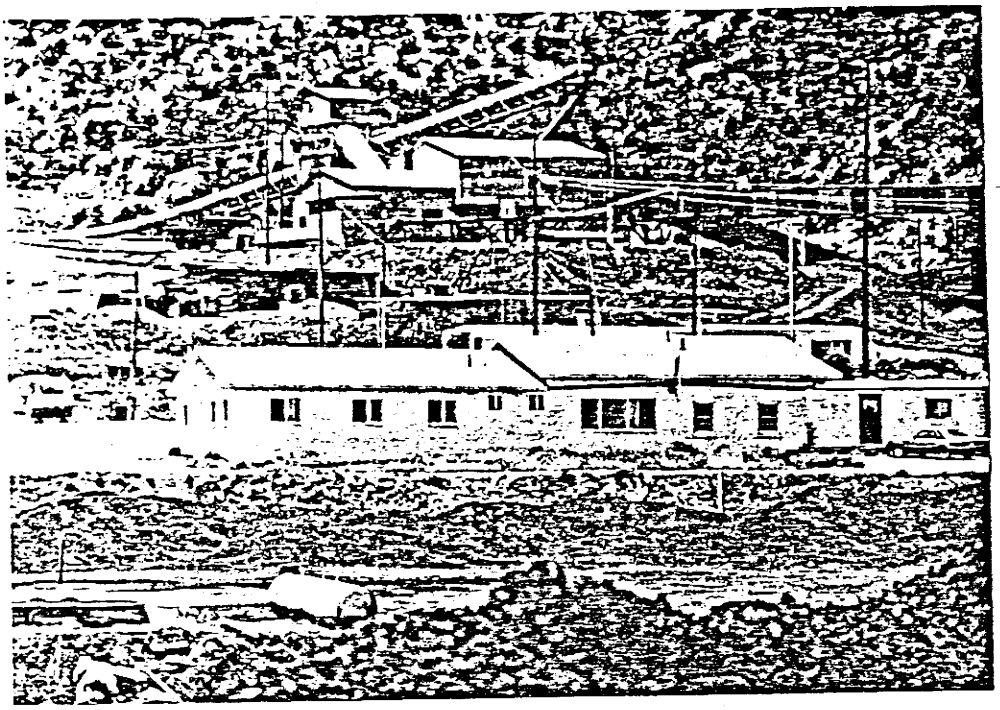


Wattis as seen today

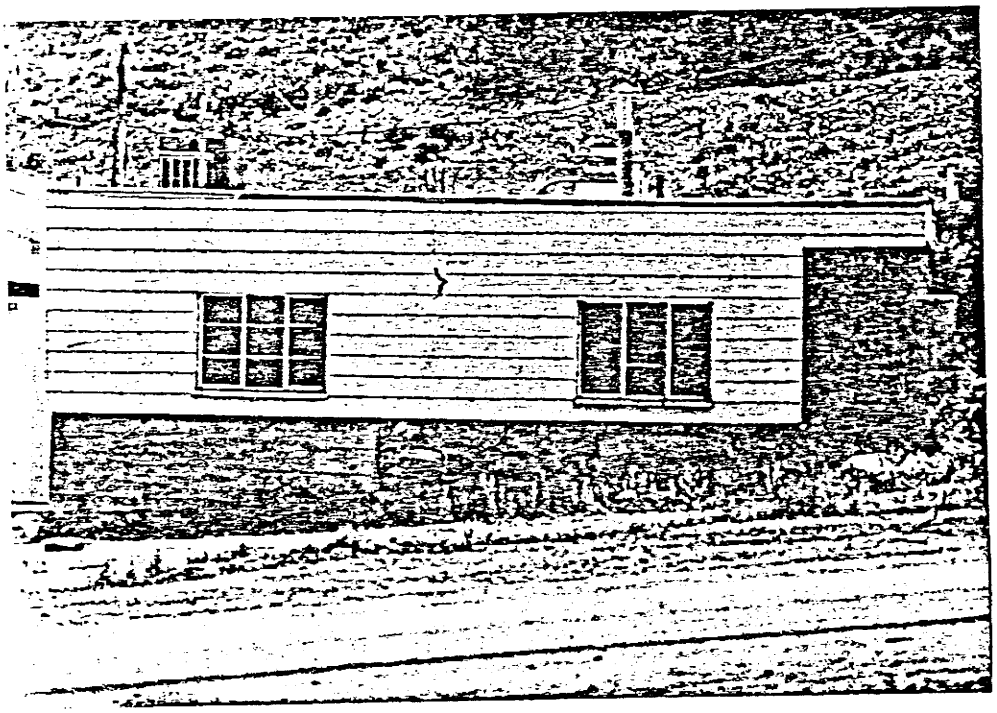


"Tipple" as it appears today - has endured considerable modification.

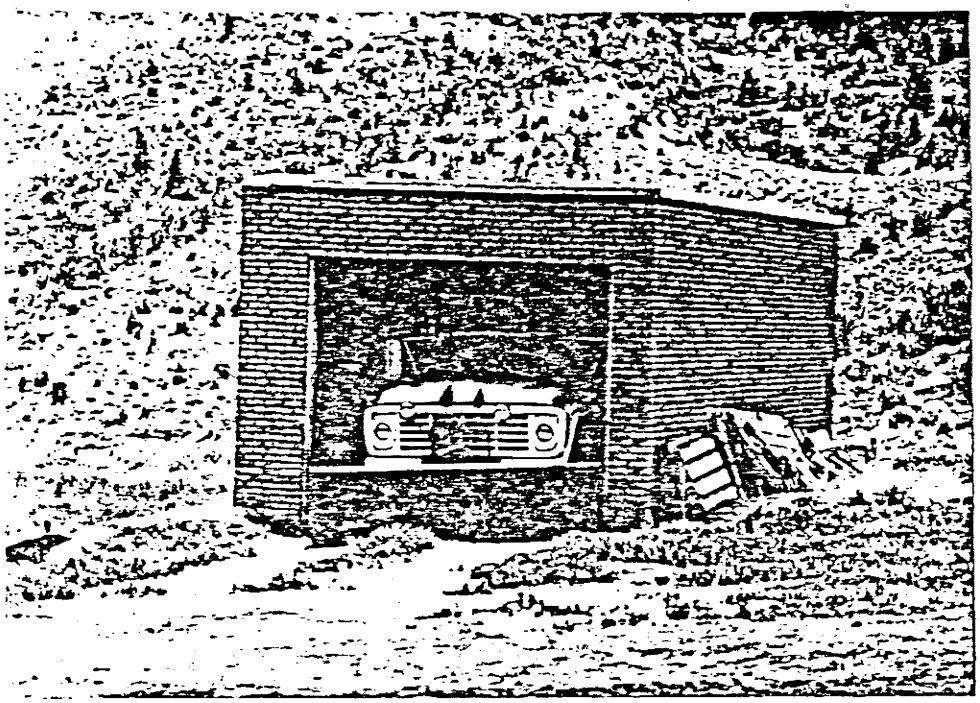
ATTACHMENT #1



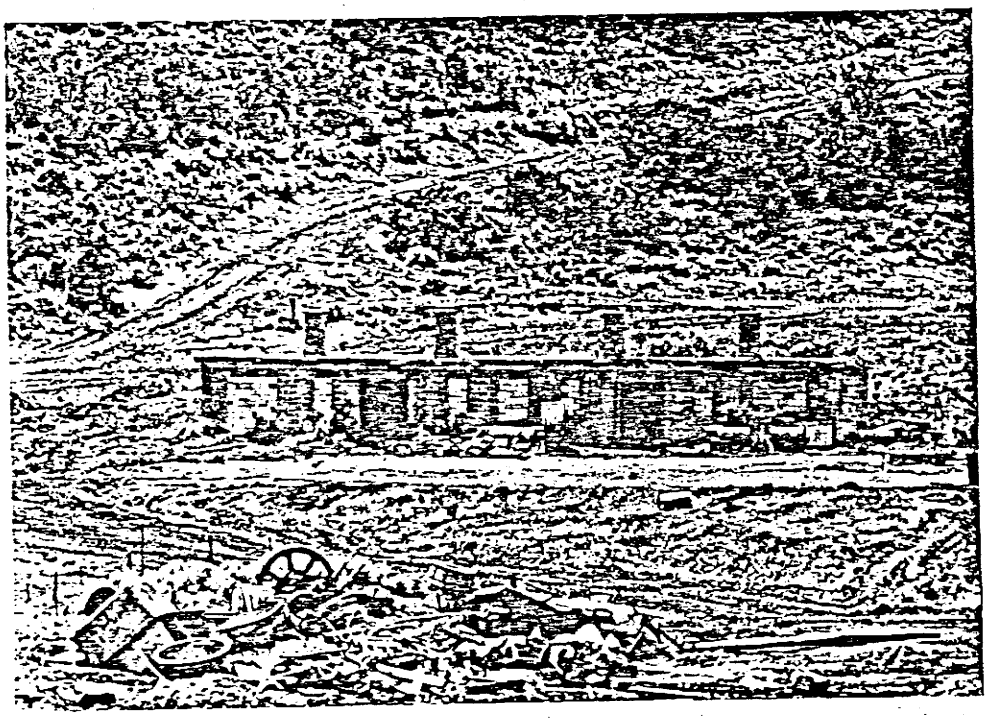
"Lower Office Complex" - the front portion is part of the old "Union Hall"



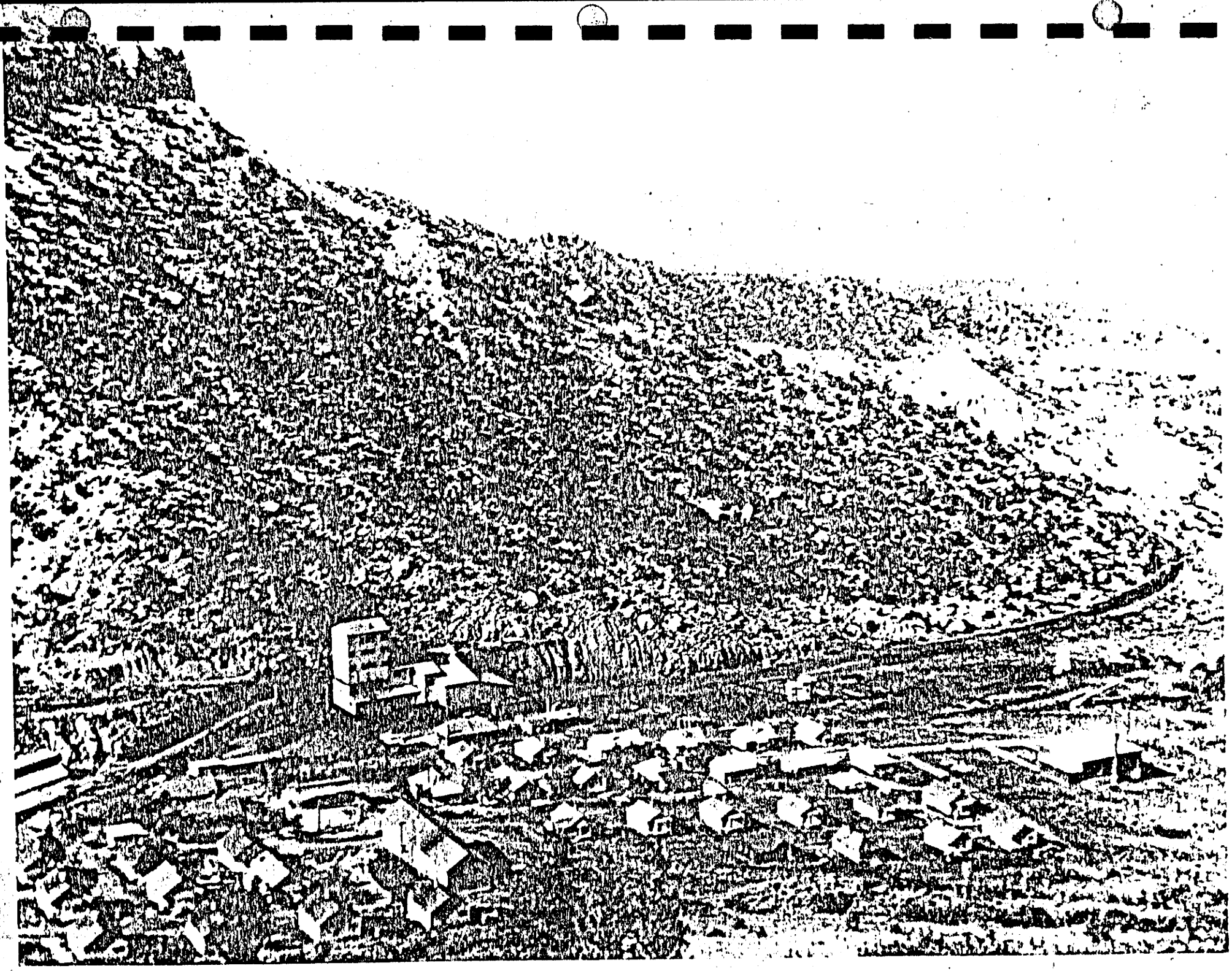
Lower Shower House - the sandstone foundation is all that remains of the old "Boarding House"



Snowplow Shed - the brick may have been salvaged from the "Old School House"



Remains of the "Old Villas" used today for dry storage



WAITIS AROUND 1949

ATTACHMENT #1

ATTACHMENT #2

PLATEAU'S ADDITIONAL RESPONSES TO OSM

APRIL 21, 1981 APPARENT COMPLETENESS REVIEW

Page 6

Cultural Resources

ATTACHMENT #2

PLATEAU MINING COMPANY
A Subsidiary of Getty Mineral Resources Company
P. O. Drawer PMC Price, Utah 84501
Telephone (801) 637-2875

RECEIVED
JUL 27 1981
KAISER ENGINEERS
Pollution Control
Dept.

July 8, 1981

IN ANSWER TO "SUMMARY OF MAJOR DEFICIENCIES" CULTURAL RESOURCES

#3 Site description enclosed.

#4 Comprehensive discussion of history and remains of structures enclosed.

It is Plateau Mining Company's opinion that none of the remaining buildings of the town of Wattis appear eligible for inclusion in the National Register. These structures, meeting hall, tipple, etc., have either been extensively altered and/or are out of period. Also, a major portion, if not all, of these structures were built during the peak demand for coal in the mid-1940's, which places the development outside of the historic period [50 years].

#5 Subsequent to the re-examination of the sites on the ground and the information recorded on the site inventory forms, it is Plateau's determination that none of the sites meet the criteria of eligibility established for the National Register. They are small, shallow sites with no archiological or historic significance beyond their location. In addition, most of the sites were collected by the surveyors which has essentially destroyed their integrity, a major criterion of eligibility.

#6 Relates and should be satisfied by #5.

#7 Plateau Mining Company feels that an intensive sample survey of all areas that may be affected by the effects of subsidence is unfounded from two [2] perspectives: [1] The area that has subsided should be the only area where subsidence will occur. The impact "if any" on historic sites would, in fact, have already occurred. [2] The questionable necessity and efficiency of such a survey. A review of the Utah State Preservation Office of recorded archeological sites in Central Utah reveals that, of the nearly 400 sites recorded above 8,000 feet, only nine [9] are not lithic scatters and of these nine, only three have potential depth. These three sites are

ATTACHMENT #2

located 30 to 50 miles South of the Star Point mine area. Therefore, the probability of sites which could be affected by subsidence being located in the "subsidence area" is exceedingly low. Sites which are located in the upland areas tend to be surface lithic scatters which would not be adversely affected by subsidence.

#8 Do to the fact that the vast majority of the ground surveyed was not Forest Service, no permit was applied for and subsequently no comments from U.S.F.S.

#9 Visibility from the air is excellent while ground visibility is diminished to a large degree by the steepness of the slope. Vegetation cover for the most part, is low to intermediate brush and scattered pinion, juniper, and low grasses and forges. Approximately 30% ground cover.

#10 No additional research need be conducted on any of the sites.

#11 The National Register of Historic places has checked and the area in question was not mentioned.

[Refer to Chapter 5, Page 5-41]

#12 Enclosed

MAC/jhs

cc: S. Rigby
B. Grimes

SCOTT M. MATHESON
GOVERNOR

STATE OF UTAH
DEPARTMENT OF COMMUNITY AND
ECONOMIC DEVELOPMENT

Division of
State History
(UTAH STATE HISTORICAL SOCIETY)

MELVIN T. SMITH, DIRECTOR
300 RIO GRANDE
SALT LAKE CITY, UTAH 84101
TELEPHONE 801/533-5755

July 1, 1981

Office of Surface Mining
c/o Plateau Mining Company
Attn: M. A. Coonrod
Environmental Coordinator
P. O. Drawer PMC
Price, Utah 84501

RE: Star Point Mine

Dear Mr. Coonrod:

The staff of the Utah State Historic Preservation Officer has reviewed the answers to the summaries of major deficiency in cultural resource as outlined by the Office of Surface Mining and submitted by Plateau Mining Company concerning the mine plan of the Star Point Mine. It is the opinion of the State Historic Preservation Office that these answers are sufficient to protect cultural resources in the mine plan area, and our office concurs with those answers.

If you have any questions or concerns, please contact Wilson Martin or Jim Dykman at 533-7039.

Sincerely,

Melvin T. Smith

Melvin T. Smith
Director and
State Historic Preservation Officer

JLD:jr:E274CB

ATTACHMENT #2

State History Board: Milton C. Abrams, Chairman • Theron H. Luke • Ted J. Warner • Elizabeth Montague • Thomas G. Alexander
Dalle C. Dayton • Wayne K. Hinton • Helen Z. Papanikolas • David S. Monson • Elizabeth Griffith • William D. Owens

SOILS - ATTACHMENT #3

APPENCICES

Physical and Chemical Properties of Soils

Soils Map

TABLE 1
SOILS ANALYSIS

Mapping Unit: PL1
Vegetative Type: Sagebrush

		Horizons				
		A1	B21+	B22+	C1	C2
Depth		0-6	6-17	17-32	32-38	38-46
Color	Dry	10YR5/3	10YR5/4	10YR6/2	10YR6/3	10YR6/3
	Moist	10YR4/3	10YR4/3	10YR5/3	10YR5/2	10YR5/2
Particle Size	% Sand	65.7	57.8	43.3	42.6	34.3
	% Silt	16.5	19.1	24.3	23.6	29.1
	% Clay	17.8	23.1	32.4	33.8	36.6
Texture Class		Sandy loam	Sandy clay loam	Clay loam	Clay loam	Clay loam
Structure		2vfgr	2msbk	2mabk	m	m
% Rock Fragment by Volume		none	none	none	none	none
% Organic Material		1.18	.54	.42	.11	.46
pH		7.04	7.30	7.90	7.70	8.04
Effervescence		es	es	es	es	ev
Solubility (ppm)	Ca	5150	8500	9625	8625	8750
	Na	7.50	9.00	11.0	16.0	62.5
	Mg	100	175	4250	675	1000
EC X 10^3		2.240	2.130	.427	1.488	.401
SAR		.037	.049	.156	.091	.216
% Moisture		1.18	.54	.42	.11	.46
Solubility (ppm)	N	2.2	.8	1.2	tr	tr
	P	12.5	2.7	2.3	1.8	2.0
	K	132	122	81	86.5	98.5

TABLE 2
SOILS ANALYSIS

Mapping Unit: PL2
Vegetative Type: Mixed Sagebrush, Grass, Mountain Brush

		Horizons		
		A1	C1	C2
Depth		0-8	8-21	21-36
Color	Dry	10YR6/1	10YR6/2	10YR6/2
	Moist	2.5Y3/2	2.5 Y4/2	2.5Y4/2
Particle Size	% Sand	14.6	12.4	10.6
	% Silt	37.8	40.2	42.8
	% Clay	47.6	47.4	46.6
Texture Class		Clay	Silty Clay	Silty Clay
Structure		2msbk/ 3vfabk	2mpr/ 3mabk	2mabk
% Rock Fragment by Volume		none	none	none
% Organic Material		.95	.56	.38
pH		7.02	7.88	7.97
Effervescence		es	em	ev
Solubility (ppm)	Ca	9175	8175	9175
	Na	12.0	11.5	12.5
	Mg	325	425	475
EC X 10^3		3.920	.308	.283
SAR		.040	.129	.184
% Moisture		.95	.56	.38
Solubility (ppm)	N	.1	.3	.3
	P	4.0	2.8	1.4
	K	162	126	90

TABLE 3
SOILS ANALYSIS

Mapping Unit: PL3
Vegetative Type: Mountain Brush

		Horizons		
		A1	B2+	C
Depth		0-4	4-16	16-26
Color	Dry	10YR5/3	10YR6/3	10YR7/2
	Moist	10YR4/2	10YR5/3	10YR5/3
Particle Size	% Sand	59.9	53.6	48.0
	% Silt	19.7	21.8	26.4
	% Clay	20.4	24.6	25.6
Texture Class		Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam
Structure		2vfgr	3fsbk	m
% Rock Fragment by Volume		15gr,5cob	5gr,5cob	5gr,20cob 10stones
% Organic Material		2.04	1.11	.79
pH		7.62	7.83	7.83
Effervescence		ev	ev	ev
Solubility (ppm)	Ca	8675	9175	9125
	Na	7.50	8.50	12.50
	Mg	175	175	175
EC X 10^3		.590	.395	.401
SAR		.075	.111	.143
% Moisture		2.04	1.11	0.79
Solubility (ppm)	N	1.7	1.6	0.2
	P	5.2	2.4	1.9
	K	97.5	43.0	37.0

TABLE 4A
SOILS ANALYSIS

Mapping Unit: PL4
Vegetative Type: Sagebrush

		Horizons A1	C1	C2
Depth		0-6	6-16	16-24
Color	Dry	10YR5/2	10YR5/2	10YR6/3
	Moist	10YR5/3	10YR5/2	10YR5/2
Particle Size	% Sand	45.6	49.1	34.6
	% Silt	33.2	24.3	33.0
	% Clay	21.2	26.6	32.4
Texture Class		Loam	Sandy Clay Loam	Clay Loam
Structure		2csbk	2csbk	2msbk
% Rock Fragment by Volume		none	none	none
% Organic Material		1.87	.83	.83
pH		7.78	7.87	8.05
Effervescence		em	eo	ev
Solubility (ppm)	Ca	6025	3100	9325
	Na	9.5	9.5	12.5
	Mg	200	325	550
EC X 10^3		.415	.383	.328
SAR		.119	.187	.202
% Moisture		1.87	.83	.83
Solubility (ppm)	N	3.0	.8	1.5
	P	7.8	3.3	4.9
	K	122	188	109

TABLE 4B

SOILS ANALYSIS

Mapping Unit: PL4

Vegetative Type: Sagebrush

		Horizons		
		C3	C4	C5
Depth		24-36	36-45	45-60
Color	Dry	10YR7/2	10YR7/2	10YR6/2
	Moist	10YR5/3	10YR5/3	10YR5/3
Particle Size	% Sand	22.3	26.8	63.1
	% Silt	41.8	39.3	18.5
	% Clay	35.9	33.9	18.4
Texture Class		Clay Loam	Clay Loam	Sandy Loam
Structure		2msbk	m	m
% Rock Fragment by Volume		none	none	none
% Organic Material		.73	1.06	.47
pH		8.04	8.18	8.55
Effervescence		ev	ev	ev
Solubility (ppm)	Ca	9075	8800	8050
	Na	30.5	53	80.5
	Mg	900	1075	1700
EC X 10^3		.370	.387	.742
SAR		.268	.310	.730
% Moisture		.73	1.06	.47
Solubility (ppm)	N	.2	tr	tr
	P	2.8	3.9	7.9
	K	74.5	74.0	79.0

TABLE 5
SOILS ANALYSIS

Mapping Unit: PL5
Vegetative Type: Sagebrush, Grass

		Horizons			
		A1	B2	C1ca	C2ca
Depth		0-3	3-17	17-35	35-60
Color	Dry	10YR6/2	10YR5/3	10YR5/2	10YR6/3
	Moist	7.5YR4/4	10YR4/4	7.5YR5/4	7.5YR5/3
Particle Size	% Sand	36.1	40.0	36.8	39.3
	% Silt	39.9	36.4	33.6	35.4
	% Clay	24.0	23.6	29.6	25.3
Texture Class		Loam	Loam	Clay Loam	Loam
Structure		2cgr	1csbk	m	m
% Rock Fragment by Volume		none	none	none	none
% Organic Material		.61	1.93	.93	.26
pH		7.72	8.02	7.96	8.11
Effervescence		em	eo	es	es
Solubility (ppm)	Ca	7250	3000	7275	8275
	Na	22.0	36.0	16.0	11.0
	Mg	200	325	350	425
EC X 10^3		.486	.287	.221	.179
SAR		.138	.287	.221	.179
% Moisture		.61	1.93	.93	.26
Solubility (ppm)	N	.8	.5	.8	.5
	P	4.5	2.9	4.5	4.6
	K	208	223	193	106

ATTACHMENT #3

TABLE 103:1 CONVERSION FACTORS *

[Milligrams per Liter - Milliequivalents per Liter]

Ion [Cation]	me/ℓ=mg/ℓX	mg/ℓ=me/ℓX
Ca^{2+}	0.04990	20.04
Mg^{2+}	0.08226	12.16
Na^{+}	0.04350	22.99

* Factors are based on ion charge and not on redox reactions that may be possible for certain of these ions. Cations and anions are listed separately in alphabetical order.

ATTACHMENT #4

Boyle Engineering Corporation

consulting engineers

268 West 400 South, Suite 301
Salt Lake City, Utah 84101

801 / 355-6109

November 16, 1981

Mr. Mel Coonrod
Plateau Mining Company
P. O. Box PMC
Price, Utah 84501

Re: Construction Monitoring Sediment Ponds

Dear Mr. Coonrod,

This letter is written to certify completion of sediment ponds numbers 4, 6, and 7 in compliance with plans and specifications prepared by Vaughn Hanson Associates.

Construction monitoring to verify compliance to specifications was accomplished by inspection visits to the sites on a regular basis. These visits were not scheduled. Random tests for compaction were taken at appropriate construction intervals.

In addition to site inspections, and as per the specifications, the contractor, Gray-Co Construction was required to take progress photos during construction. Also, prior to Boyle Engineering being retained to perform construction monitoring, numerous compaction tests were taken by Gray-Co. In order to verify compliance, all photos have been reviewed. The method of compaction testing by Gray-Co. personnel was monitored prior to acceptance of results.

Attached are the proctor and compaction test results. We will retain progress photos for reference as necessary.

Sincerely,

BOYLE ENGINEERING CORPORATION

David R. Ariotti

David R. Ariotti, P.E.

Copies: Vaughn Hanson Associates
Gray-Co Construction

ATTACHMENT #4

Boyle Engineering Corporation

BY DRA DATE 10/15/81 SUBJECT Plateau Pond #6 SHEET NO. 1 OF 1

CHKD. BY _____ DATE _____ JOB NO. DN-P01-001-00

TEST NO.	PROBE DEPTH	MOIST. COUNT	COUNT RATIO	MOIST. PCF	DENSITY COUNT	COUNT RATIO	WET DENSITY	PERCENT COMP.	PERCENT MOIST.
1	8"	584	.576	10.25	423	.674	132.0	102	8.4

NOTES: Rained out before more tests could be taken.

~~Maximum Dry Density~~ ~~119.0%~~
Optimum Moisture 12.9%

ATTACHMENT #4

Boyle Engineering Corporation

BY WC DATE 10-20-81 SUBJECT Plateau Pond #6 SHEET NO. 1 OF 1

CHKD. BY _____ DATE _____ JOB NO. DN-P01-001-00

TEST NO.	PROBE DEPTH	MOIST. COUNT	COUNT RATIO	MOIST. PCF	DENSITY COUNT	COUNT RATIO	WET DENSITY	PERCENT COMP.	PERCENT MOIST.
1	8"	592	.795	16.25	431	.684	131.5	96.8	14.3
2		469	.630	11.75	456	.724	128.0	97.7	10.1
3		505	.678	13.00	446	.708	129.5	97.9	11.2
4		573	.769	15.50	412	.654	134.0	99.6	13.1
5		586	.787	16.00	402	.638	135.5	100.4	13.4
6		636	.854	17.75	395	.627	136.0	99.4	15.0
7		610	.819	16.75	439	.697	130.5	95.6	14.7
8		547	.734	14.50	385	.611	137.5	103.4	11.8
9		501	.672	13.00	406	.644	134.5	102.1	10.7
10		517	.694	13.50	457	.725	128.0	96.2	11.8
11	8"	570	.765	15.50	439	.697	130.5	96.6	13.5

NOTES: Maximum Dry Density 119.0%
Optimum Moisture 12.9%

ATTACHMENT #4

Boyle Engineering Corporation

BY D/R/A DATE 10/29/81 SUBJECT Plateau Pond #7 SHEET NO. 1 OF 1

CHKD. BY _____ DATE _____ JOB NO. DN-P01-001-00

TEST NO.	PROBE DEPTH	MOIST. COUNT	COUNT RATIO	MOIST. PCF	DENSITY COUNT	COUNT RATIO	WET DENSITY	PERCENT COMP.	PERCENT MOIST.
1	8"	494	.668	12.75	431	.685	131.0	93.3	10.8
2	8"	512	.692	13.5	408	.649	134.5	95.5	11.2
3	8"	559	.775	15.75	423	.672	132.0	91.8	13.5
1	4"	494	.668	12.75	1004	1.596	130.0	92.5	10.8
2	4"	512	.692	13.5	975	1.550	132.5	93.9	11.4
3	4"	559	.775	15.75	973	1.547	132.5	92.1	13.5

NOTES: Maximum Dry Density 126.7%
Optimum Moisture 8.8%

Average of above tests 93.2%. However, this is based on modified proctor. Standard proctor results would be greater. Specifications do not indicate proctor type. Assume most commonly used to govern (standard proctor). Therefore test ok @ $\bar{x}$ = 93.2%

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P-01-001-00

R&M CONSULTANTS, INC. BUSCH PARK • 5280 SOUTH 320 WEST, SUITE 160 • MURRAY, UTAH 84107 • PHONE (801) 263-3419
ENGINEERS
GEOLOGISTS

RECEIVED
NOV 02 1981
BOYLE ENGINEERING CORP.

October 30, 1981 R&M No. 161024

Dave Ariotti
Boyle Engineering Corp.
18 South Carbon Ave.
Price, UT 84501

Subject: Proctor Density Test Results for Sedimentation Ponds Nos. 4, 6 and 7

Dear Dave:

Attached are the final results of the Proctor density tests for the above sites. Preliminary test results were relayed to you by telephone on October 7 and October 12.

The sample for Sedimentation Pond No. 4 was obtained by channel sampling the downstream slope of the existing embankment. The sample consists of a mixture of the two different colored clayey materials evident on the slope. The sample for Sedimentation Pond No. 6 was obtained by channel sampling the exposed slope northeast of the proposed basin. The sample for Sedimentation Pond No. 7 was obtained by channel sampling the exposed slope adjacent to the south of the proposed basin.

If there are any questions, please call.

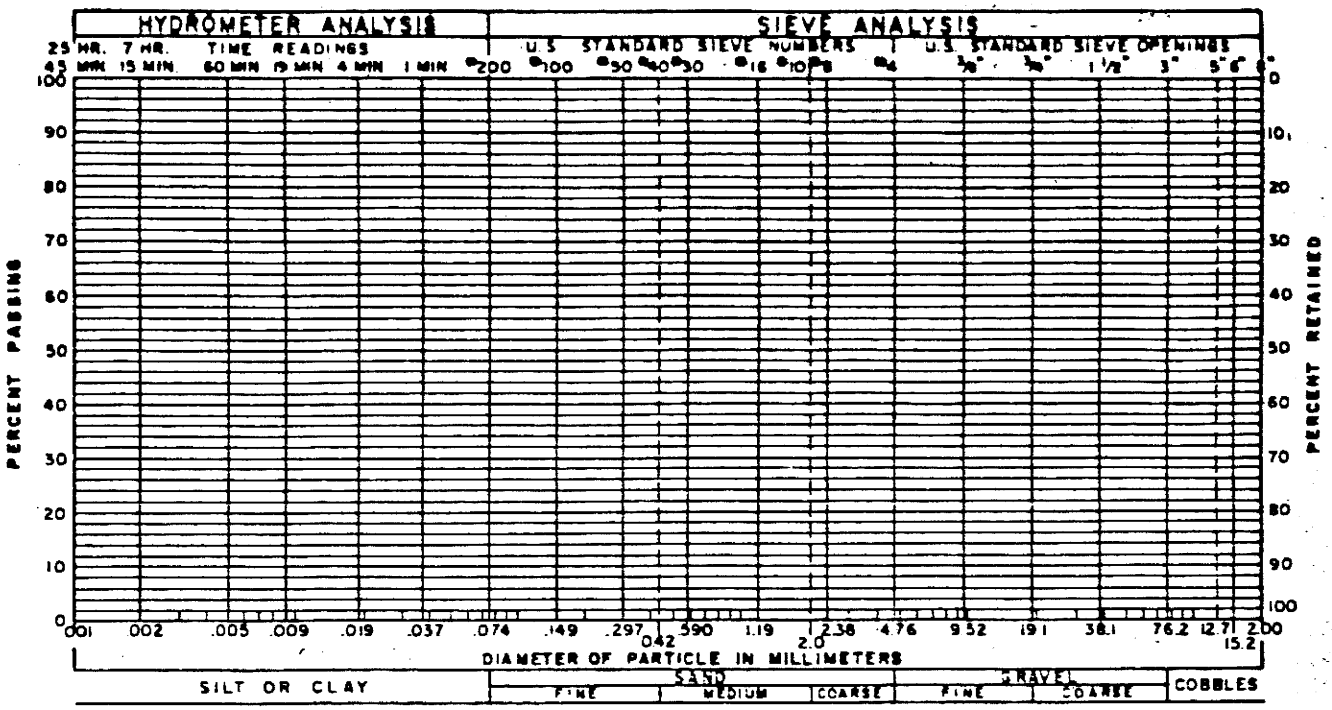
Sincerely,

LaMonte Sorenson
Senior Engineering Geologist

CW

ATTACHMENT #4

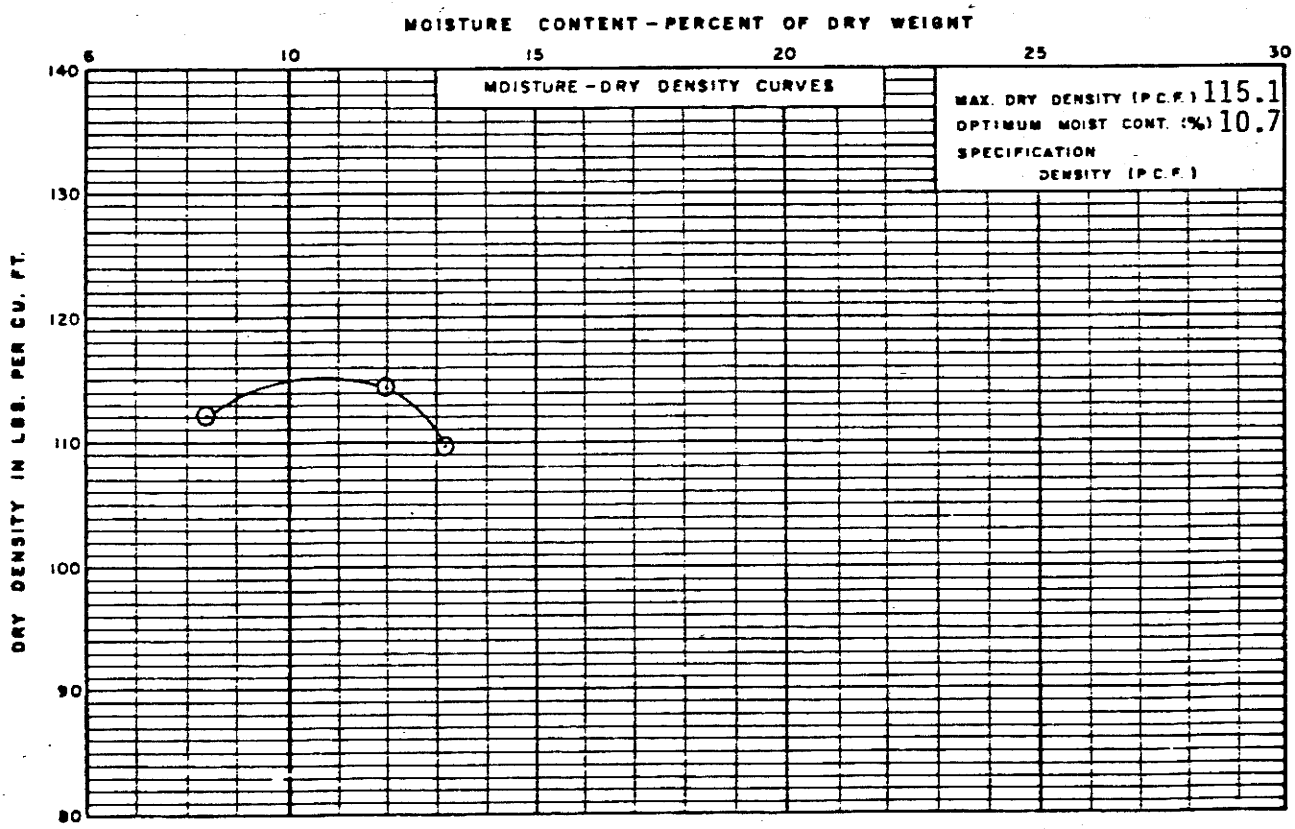
Delta



GRADATION TEST RESULTS

GRAVEL % SAND % SILT AND CLAY %

LIQUID LIMIT % PLASTICITY INDEX %



COMPACTION TEST RESULTS

COMPACTION TEST PROCEDURE ASTM D 698, Method C

SAMPLE OF Gravelly sandy clay

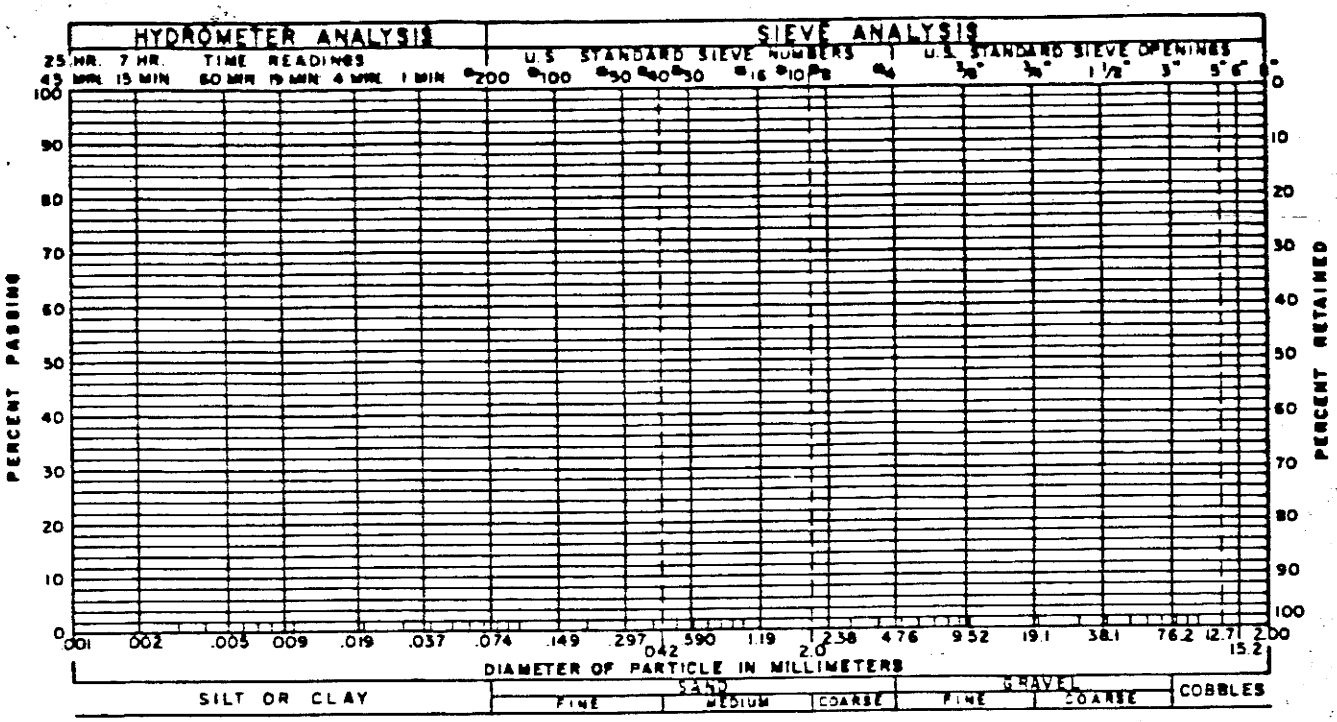
FROM Sediment Pond No. 4 DEPTH Channel sample from downstream Embankment Slope

Job No. 161024

ATTACHMENT #4

Figure 1

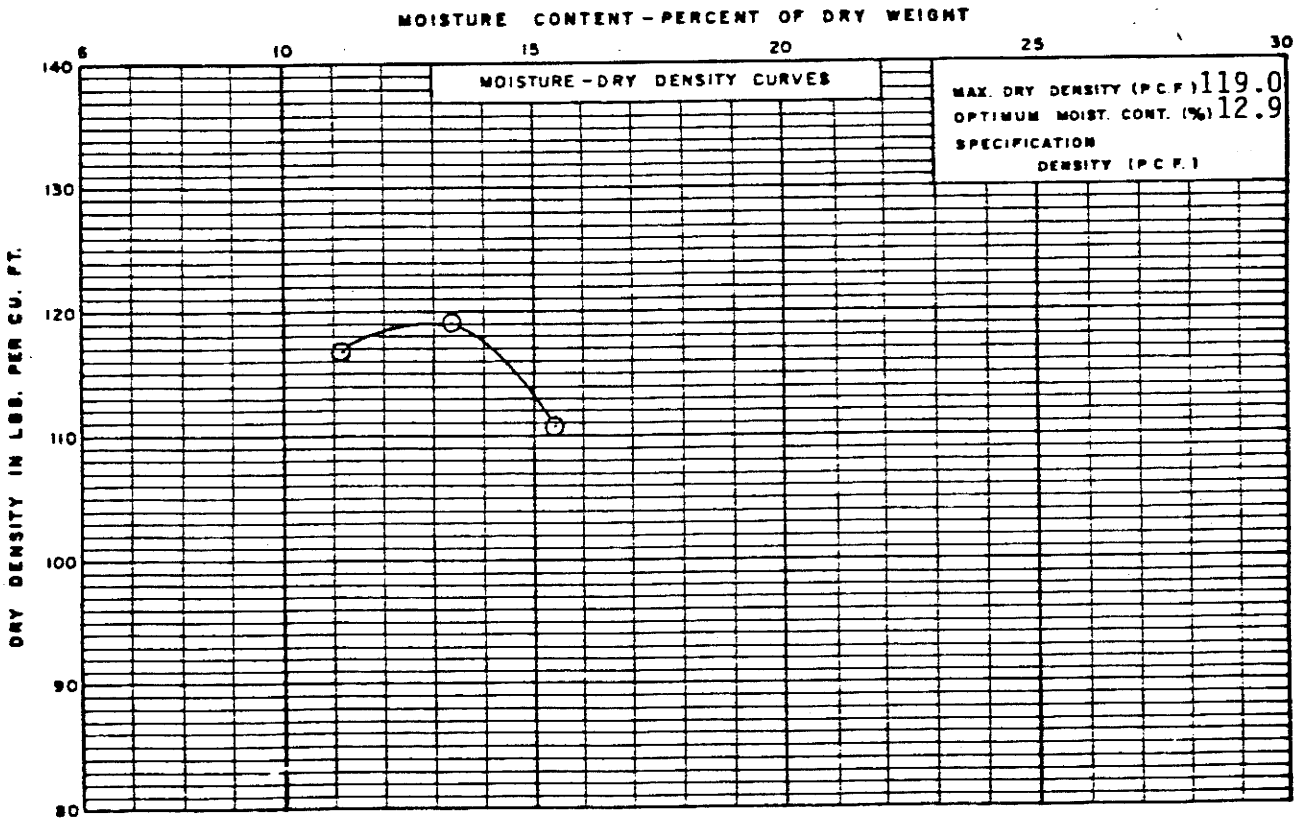
Delta



GRADATION TEST RESULTS

GRAVEL % SAND % SILT AND CLAY %

LIQUID LIMIT % PLASTICITY INDEX %



COMPACTION TEST RESULTS

COMPACTION TEST PROCEDURE ASTM D 1557-70, Method A

SAMPLE OF Sandy clayey gravel

FROM Sediment Pond No. 6 DEPTH Channel sample in borrow area adjacent to embankment.

Job No. 161024

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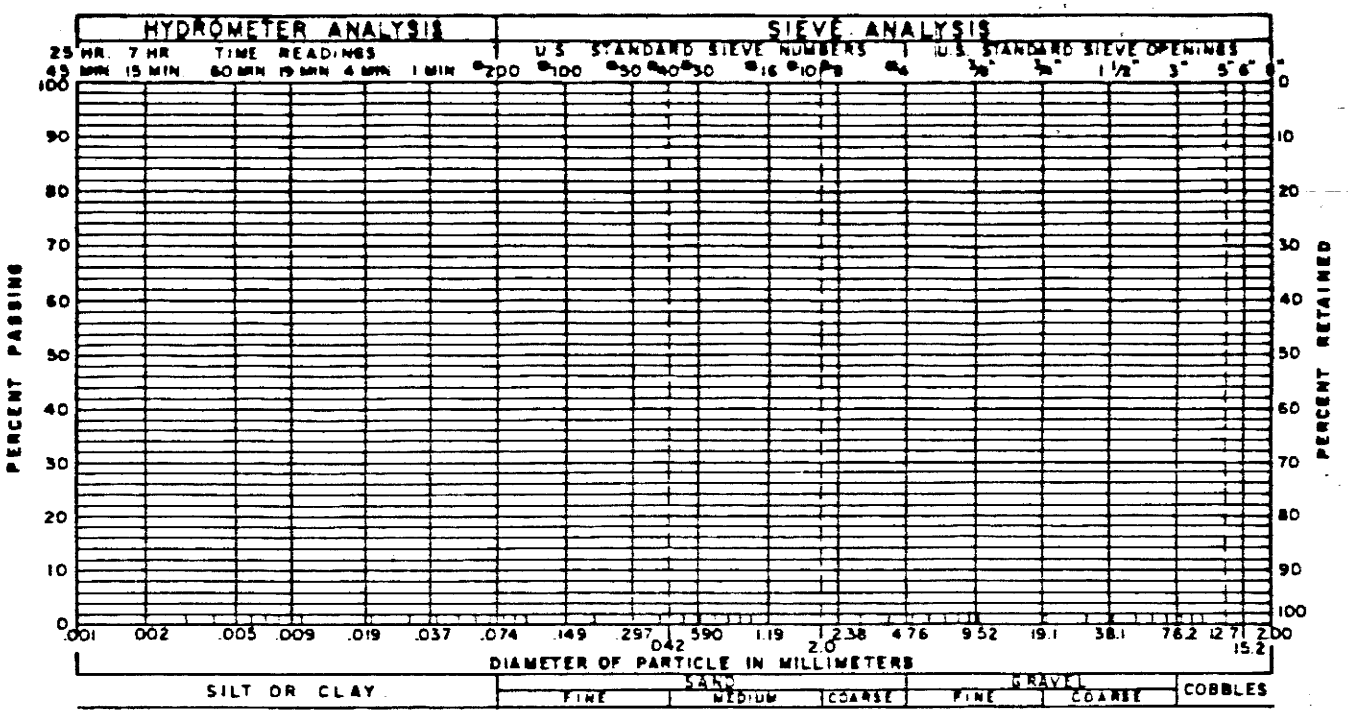
Figure 2

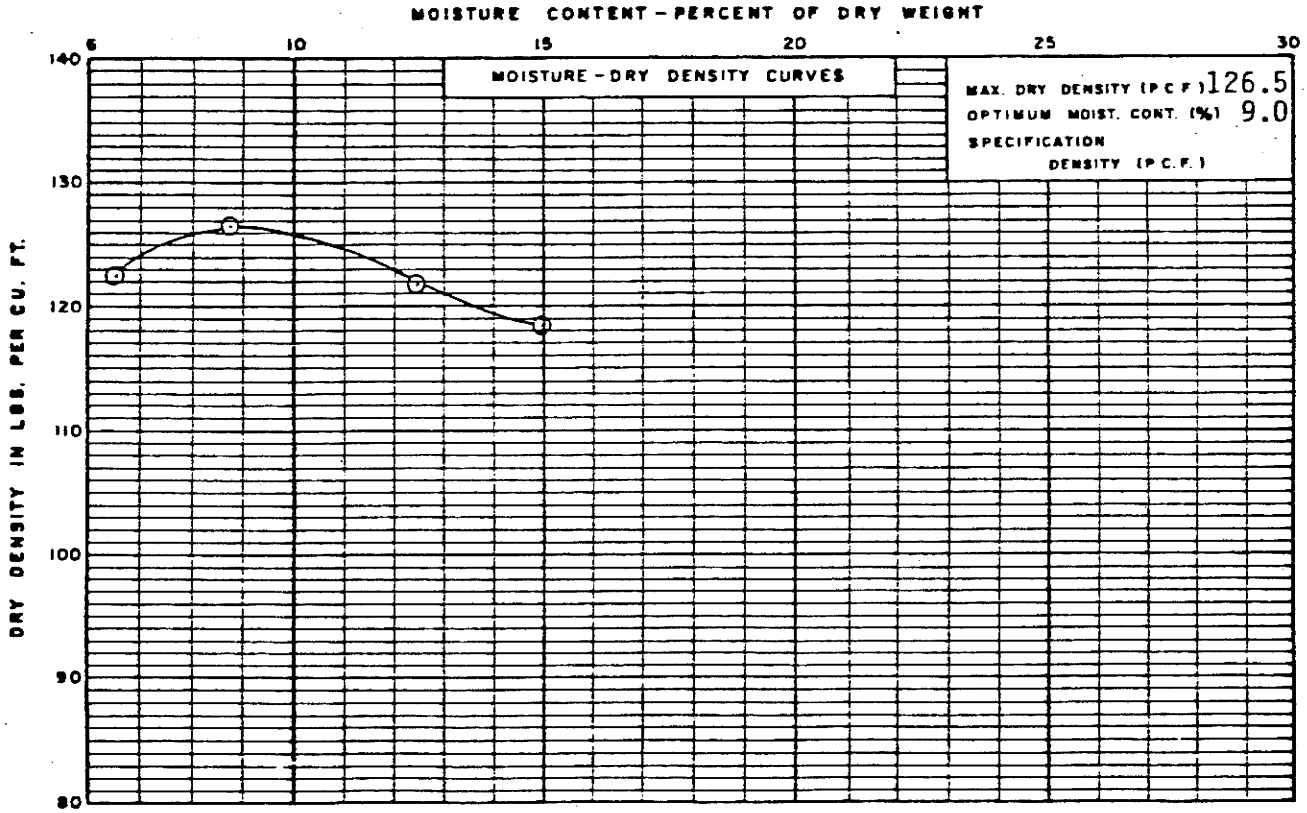
Delta



GRADATION TEST RESULTS

GRAVEL % SAND % SILT AND CLAY %

LIQUID LIMIT % PLASTICITY INDEX %



COMPACTION TEST RESULTS

COMPACTION TEST PROCEDURE ASTM D 1557-70, Method C

SAMPLE OF Sandy Gravel

FROM Sediment Pond No. 7 DEPTH Channel sample from cut slope adjacent to basin

Job No. 161024

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Figure 3

R&M CONSULTANTS, INC. BUSCH PARK • 5280 SOUTH 320 WEST, SUITE E-160 • MURRAY, UTAH 84107 • PHONE (801) 263-3419
ENGINEERS
GEOLOGISTS

November 18, 1981

Steve Rigby
Plateau Mining Co.
P.O. Box PMC
Price, UT 84501

RE: Slope Stability Report for Pond 1, 3 & 5, Plateau Mine, Wattis, Utah

Gentlemen:

In accordance with your request, we have completed the slope stability analysis for the above sedimentation ponds. The purpose of this letter is to address the stability safety factors indicated in the formal report for different static and dynamic load conditions. As you are aware, the Utah State Division of Oil, Gas & Mining (DOGM) requires a factor of safety against sliding for static conditions to be no less than 1.5; and for dynamic condition (earthquake) no less than 1.1.

For use in the analysis, field data was determined by boring and sampling in the constructed embankments. Classifications for soils and certain physical properties were determined by laboratory testing. Utilizing these properties supplemented with published data, values for cohesion, angle of internal friction, density, etc. were determined.

Attached with this letter is a copy of Table 1, showing calculated values from the formal report. For Pond #1 it should be noted that without seismic force applied, the embankment is stable in its present configuration. However, the factor of safety is less than 1.5 as required by DOGM. For Pond #1, none of the critical slope failure circles were deep seated, rather all failure circles for every case were shallow in depth and were characteristically surface failures within the top six ft of the fill material for the pond embankment. Therefore, we do not anticipate a total embankment failure, and the pond would remain in place should embankment failure occur. The only damage to property caused by a surficial slope failure on this fill would be aesthetic, since no critical structures exist in the area below the embankment. Even a complete embankment failure, which we do not anticipate occurring, would not have catastrophic consequences because the pond is small and no stream exists below the sedimentation pond that could be polluted. Water from the pond would immediately be absorbed by surface vegetation and permeable soils.

It is our judgment that the depth of water in the pond will have little or no effect on the most critical sliding failure mode. Since the capacity of the pond is greater than DOGM design requirements, it is highly unlikely the pond will

ATTACHMENT #4

ever be full and even more unlikely that the pond will be full during total embankment failure.

We recommend that Plateau Mining seek a variance for the requirements of factor of safety on the slope stability of Pond #1 embankment with the following points under consideration: a) The slope stability analysis was performed for 100 failure surfaces of which the worst static condition was 1.09, and the worst seismic condition was .89. These failures are surficial and localized in nature and should be repaired immediately if they ever occur. No damage to life or property will be affected by these particular failures; b) A single stand pipe piezometer was installed in the embankment fill. Readings should be made at periodic intervals, perhaps four times annually to determine whether the water table has risen above the projected water table line shown in the calculations. If water is found in the Pond #1 piezometer at depths less than 16 ft, a geotechnical engineer should be notified immediately to determine whether action should be taken to lower the seepage line elevation; c) the downhill slope of Pond #1 embankment has already been seeded for re-vegetation. This effort must not be neglected. Periodic inspection should be made on the vegetation effort; d) the embankment for Sedimentation Pond #1 has been placed in an area that has already been disturbed. This location was suggested by DOGM because of its desirability from an environmental degradation standpoint. Since embankment failure does not constitute any appreciable damage to life and property, the cost in embankment changes to improve the factor of safety against sliding to be greater than 1.5, is high compared to the benefit achieved; e) for the tenth most critical slide failure, the static factor of safety is 1.2 and the dynamic factor of safety is 1.1. It is reasonable to assume that for extremely deep seated failures which would take the total embankment and pond down the hill, the factor of safety will be approximately 1.5 static and 1.1 or greater in the dynamic condition.

Stability calculations for Pond #3 indicate that deep seated failure is more likely to occur than surficial slip circle failure. We recommend that a variance be sought for the factors of safety less than 1.5 static and 1.1 dynamic considering the following: a) Factors of safety are greater than 1 for all conditions and the embankment therefore should not fail. Even if failure should occur, it will not constitute serious effect on life or property. To render the embankment stable in its present location would create undue economic hardship for Plateau Mining considering the benefit achieved; b) Based on published data, there is a 90% probability that acceleration of bedrock of 0.1g will not be exceeded in the general site area for a period of 50 years (UBC, 1979; Algermissen & Perkins, 1976; Utah Seismic Advisory Council, 1979). This estimate is based on: 1) Delineated seismic source; 2) Statistical consideration of the historic seismic record; 3) Determination of extreme cumulative probability for a given time period. Since the site is underlain by bedrock at shallow depths, amplification of seismic energy should not occur. For a minor pond such as Pond #3 any safety factor over 1 for seismic failure should be considered as

adequate; 4) Periodic inspections should be made, possibly every two months to inspect the top of the embankment for surface cracks. Also, the water level should be determined utilizing the installed stand pipe piezometer. If the determined water level is ever less than 20 ft in depth, a geotechnical engineer should be notified immediately to determine whether corrective action is necessary.

Pond #5 is sufficiently close to the DOGM required safety factors, that stability is not a serious question. We feel that a variance should be sought and indeed granted for Pond #5 without question.

Since subsurface physical characteristics of soils may vary, the accuracy of the slope stability calculations should not be considered better than plus or minus 10% (a variation in pure safety factor between plus and minus 0.15).

Since the stability characteristics of the pond embankments do not meet requirements of Utah State DOGM, future alterations to geometry or pond capacity should not be made without total review of stability by a geotechnical engineer. Inspections recommended in the above paragraphs are imperative to ensure against failure.

We recommend that the variance for these ponds be sought and feel that the request is reasonable and does not have a serious effect on the safety or property and more importantly, safety of human life in the Plateau Mine area.

Please feel free to call if you have questions concerning specifics within the report or details within this letter.

Sincerely,

Larry Migliaccio, P.E.
Director

cw

cc: Dave Ariotti/Boyle Engr

SEDIMENTATION PONDS NO. 1, 3 & 5

EMBANKMENT SLOPE STABILITY STUDY

R&M CONSULTANTS, INC.

ENGINEERS GEOLOGISTS

ATTACHMENT 14

R&M
R&M CONSULTANTS, INC. BUSCH PARK • 5280 SOUTH 320 WEST, SUITE E-160 • MURRAY, UTAH 84107 • PHONE (801) 263-3419
NGINEERS
OLOGISTS

R&M No. 161024

November 18, 1981

Mr. David Ariotti
Boyle Engineering Corp.
18 South Carbon Ave.
Price, UT 84501

Dear Dave:

SUBJECT: Sedimentation Ponds No. 1, 3 & 5 Embankment Slope Stability Study, Plateau Mining Co.

Included herewith are three copies of the embankment slope stability study report for the subject project. This report was authorized by Boyle Engineering Corp. on September 29, 1981.

We appreciate the opportunity of providing this geotechnical service to you on this project and will be glad to answer any questions you may have concerning this report.

Sincerely,

Larry Migliaccio, P.E.
Director

REGISTERED PROFESSIONAL ENGINEER
LARRY MIGLIACCIO
3595
STATE OF UTAH

CW

cc: Mr. Mel Coonrod, Plateau Mining (2 copies)

ATTACHMENT #4

EMBANKMENT SLOPE STABILITY STUDY
FOR
SEDIMENTATION PONDS NO. 1, 3 and 5
PLATEAU MINING CO.
WATTIS, UTAH

Prepared for

BOYLE ENGINEERING CORP.
Price, Utah

by

R&M CONSULTANTS, INC.
Salt Lake City, Utah

Proj. No. 161024

November, 1981

ATTACHMENT #4

R&M

I. INTRODUCTION

Presented in this report are the results of our geotechnical study on the embankment stability of three existing sedimentation ponds located on property leased by Plateau Mining Co. near Wattis, Carbon County, Utah (Drawing No. 1). This report has been prepared in accordance with a contractual agreement between R&M Consultants, Inc., Salt Lake City, and Boyle Engineering Corp., Price, Utah.

II. SCOPE

The embankments of the three ponds investigated, referred to herein as Sedimentation Ponds No. 1, 3, and 5, are man-placed fill embankments varying from 12-15 ft in height on the pond side and up to 160 ft in height on the downstream embankment slope. Each embankment impounds a sedimentation pond ranging from 2500-7500 sq ft in plan size. The purpose of these ponds is to serve as temporary water retention basins for surface runoff water collected from the general surrounding areas. The water is allowed to filter into the ground while the suspended particles, including the coal waste, are to be deposited on the bottom of the ponds.

The objective of our study is to determine the stability of each of the embankments. The scope of work included a drilling program of one test hole in each embankment of the ponds to investigate the subsurface conditions, a laboratory testing program to determine the engineering characteristics of the subsoils encountered and a slope stability analysis based on the data obtained from the drilling program, the lab test results, and field observations.

III. EXISTING SITE CONDITIONS

Sedimentation Pond No. 1

The embankment for this pond is located within the uppermost portion of a narrow, deep, very steep-walled drainage, which concaves upstream and extends for roughly 150 ft across the drainage in a normal direction. The crest of the embankment is about 15 ft vertical above the excavated floor of the sedimentation pond with the upstream embankment slope graded at 2H:1V. The crest width of the embankment is 15 ft. The downstream embankment slope is approximately 65 ft in height and slopes at approximately 1.4H:1V. The central portion of the toe of the downstream embankment slope is located within the channel of the ephemeral drainage.

The left abutment of the embankment is located normal to and on a very steep natural slope of the drainage. The right abutment grades into the surface of a level, man-placed fill area associated with the coal crushing facilities.

The impoundment area consists of a shallow basin roughly 50 x 50 ft in plan dimensions which has been excavated into the natural ground surface. The basin contained approximately 3 ft of water at the time of our investigations. Bedrock outcrops in the upstream wall of the impoundment excavation. The natural ground surface upstream from the impoundment is at a steep to very steep slope.

Sedimentation Pond No. 3

The embankment of this pond is located near the head of a narrow, deep, steep-walled drainage, which concaves upstream and extends for roughly 220 ft across the drainage in a normal direction. The crest of the embankment is approximately 12 ft vertical above the excavated floor of the sedimentation basin and is graded at a 2H:1V slope on the pond side. The crest width of the embankment is 14 ft. The downstream embankment slope is approximately 160 ft in vertical height and slopes at approximately 1.4H:1V. The central portion of the toe of the downstream embankment slope is located within the channel of the ephemeral drainage.

The left abutment of the embankment is located roughly parallel to and on the uppermost portion of the side of a small lateral drainage. This drainage is also ephemeral, and is projected to join the main drainage at the approximate area of the toe of the downstream slope. The right abutment is located on and grades into a level area of man-placed fill used in truck loading activities.

The impoundment area consists of a shallow basin apparently excavated into the fill material and is approximately 50 x 150 ft in plan dimensions. The basin contained no water at the time of our investigations. The natural ground surface upstream from the impoundment is at a steep to very steep slope.

Sedimentation Pond No. 5

The embankment of this pond is located at the head of a narrow, deep, very steep-walled drainage, which concaves upstream and extends for roughly 125 ft across the drainage. The upstream embankment slope is 14 ft in vertical height above the basin floor and is graded at a 2H:1V slope. The crest width of the embankment is approximately 14 ft. The downstream embankment slope is approximately 25 ft in height and slopes at approximately 1.4H:1V. The fill embankment extends onto a natural slope that continues at the same slope to the channel of the drainage, approximately 60 ft below the embankment crest.

The left abutment is apparently located on and approximately normal to the projected trend of the natural ground surface in this area. At this abutment, the presumed natural ground surface is covered by a steep, 30-ft high slope of a coal waste pile. The right abutment is located on and approximately normal to a steep to moderate natural ground slope.

The impoundment consists of a shallow basin roughly 50 x 100 ft in plan dimensions. The basin contained approximately 3 ft of water at the time of our investigations. The natural ground surface upstream of the impoundment is at a moderate slope.

IV. SUBSURFACE INVESTIGATIONS

Subsurface conditions were investigated by drilling one test hole at each of the sites as shown on Drawing No. 2. Test hole locations were determined in the field and were located close to the center of crest at the deepest portion of each of the embankments. Test Hole 1 (TH-1) was located on the embankment of Sedimentation Pond No. 1 and was drilled to a depth of 41.5 ft. Test Hole 2 (TH-2) was located on the embankment of Sedimentation Pond No. 3 and was drilled to a depth of 46.5 ft. Test Hole 3 (TH-3) was located on the embankment of Sedimentation Pond No. 5 and was drilled to a depth of 27 ft.

Method of Investigation

Hollow stem, continuous flight auger of 6-in. O.D., powered by a truck-mounted CME-55 drilling rig, was used in the test hole drilling.

Disturbed and undisturbed soil samples were obtained from each test hole at approximate 5-ft intervals using a Standard split spoon of 1-3/8 in. I.D. and a California split spoon sampler of 2.5-in. I.D. Dynamic penetration tests were performed using a 140-lb hammer, with 30-in. free fall, to drive the split spoon samplers into the bottom of the test hole. The resultant blow count of each test, which consists of the sum of the blows required to advance the sampler the last two 6-in. intervals of each 18-in. sampling interval, is a function of the in-situ density or consistency of the soil tested.

One to two bag samples of the auger return were also obtained from each test hole to determine the moisture-density relations (Proctor tests) of the embankment material.

The soil samples were visually classified in the field and forwarded to the soils laboratory for testing to determine their engineering properties.

Subsurface Conditions

Subsurface conditions, based on data obtained from test hole drilling, are presented below. The boring logs for the test holes are included in Appendix A.

Sedimentation Pond No. 1

TH-1, in the embankment of Sedimentation Pond No. 1, encountered 9 ft of fill consisting of medium dense fine sand and silt with some sandstone rock fragments of gravel and cobble size. A trace of visible moisture was noted in the lower portion of this material. This material is underlain by a slightly moist to moist, medium dense to loose coal fill, consisting of silt, sand and gravel-size coal fragments, to depth 24.5 ft. The fine sand and silt material in the coal fill is derived from sandstone parent rock and ranges from a trace to roughly 30% in volume.

The approximate natural ground surface was encountered at depth 24.5 ft. Beneath this contact, medium dense, highly weathered to decomposed bedrock was encountered which extends to 41.5 ft, the total depth of the test hole. The bedrock consists of a generally uniform, gray, fine sand and silt containing approximately 30% of silty, fine-grained sandstone rock fragments. The upper portion of this material contains appreciable visible moisture, while the lower portion decreases to slightly moist with increasing depth below depth 30 ft.

Sedimentation Pond No. 3

TH-2 in the embankment of Sedimentation Pond No. 3 encountered 29 ft of light to dark gray, medium dense to loose fill consisting predominantly of fine sandy silt with a trace to occasionally predominant gravel. This fill material also contains varying amounts of small to large cobbles of sandstone rock throughout its depth. Traces of clay and coal chips are encountered intermittently throughout this portion. This material is slightly moist to moist with a trace of visible moisture

encountered near the bottom of the layer. This fill overlies distinctly different fill, consisting of a dark gray to gray brown, stiff, silty to sandy clay, with a trace to some gravel of sandstone and coal. This fill material is uniformly slightly moist.

Sedimentation Pond No. 5

TH-3, in the embankment of Sedimentation Pond No. 5, encountered a fill material consisting of light to medium brown, stiff or medium dense fine sandy to silty clay containing varying amounts of gravel which range from a trace to 40%. Traces of gravel size coal were encountered. The material is moist decreasing to slightly moist with depth. The natural ground surface underlying the fill material was encountered at approximately 13.5 ft. Highly weathered bedrock was encountered from the natural ground surface at 13.5 ft to 27 ft, the total depth drilled. The bedrock consists of hard, light brown and occasionally red and buff, silty, fine grained sandstone. The sandstone is closely fractured with silt and fine sand in the fracture openings. This material is dry to slightly moist.

Ground Water

Free water was encountered only as visible moisture as described in the above paragraphs. No distinct static ground water table was observed. Piezometers were installed in each of the three test holes in order to monitor possible future groundwater occurrences.

V. LABORATORY TESTING

Laboratory tests were conducted on selected samples to determine their classification and engineering characteristics. Testing included determination of moisture content, dry density, Atterberg limits, soil particle gradation, and moisture-density relations. The test results are included in Appendix B.

Eleven soil samples, taken from the embankment fill materials and the natural ground in the test holes, were tested for their moisture contents (Table B-1). The moisture contents for the soils in TH-1 are fairly constant throughout its depth and are approximately 10%. The moisture contents for the fill materials in TH-2 vary from 4.5% to 12.5% with the high moisture in the materials close to the interlayer boundary of the silt fill and the clay fill. The moisture contents for the materials in TH-3 vary from 5.9% to 11.2%, with the high values in the clay fill embankment.

Five soil samples from the fill embankments and the natural ground were tested for their dry densities. These soil samples were obtained in brass liners by a California sampler. The dry densities in the embankment fill materials vary from 89.2 to 124.2 pcf. The wide range of the dry density of the fill embankment materials is probably due to the varying amounts and the sizes of the existing rock fragments and the non-uniform compaction efforts received by the fill embankment materials. The dry densities for the natural ground material is relatively uniform and averages 102 pcf.

The Atterberg limits on two samples of the clay fill embankment material obtained from TH-2 show liquid limits of 21.3 and 21.4%, and plasticity indices of 3.4 and 3.9, indicating the material is only slightly plastic. The test on a samples of the clay fill embankment material obtained from TH-3 shows a liquid limit of 19.0% and a plasticity index of 1.5, indicating the material is almost non-plastic.

Sieve analyses were performed on three soil samples (Figs. B-1 through B-2). The sample obtained from below the natural ground surface from TH-1, at depth 30-31.5 ft, indicates the material is fairly well graded with 27.5% finer than No. 200 sieve. The soil sample obtained from the silty embankment fill material in TH-2 shows a poorly graded silty gravel with 20.7% finer than No. 200 sieve. The

soil sample obtained from the clayey embankment fill material in TH-3 is fairly well graded with 40.9% finer than No. 200 sieve.

Five compaction tests were conducted according to ASTM D698 (Standard Proctor) on samples taken from the embankment fill materials to determine their moisture-density relations (Figs. B-3 through B-7). The test results show the sandy, silty fill of the Pond No. 1 embankment can be compacted to a maximum dry density of 123.6 pcf at an optimum moisture of 9.5%, and the underlying silty, gravelly coal fill to a maximum dry density of 117.5 pcf at an optimum moisture content of 10.6%. Similarly, the silty, sandy fill of the Pond No. 3 embankment can be compacted to a maximum dry density of 113.0 pcf at an optimum moisture of 11.8%. The clayey fill of the Pond No. 5 embankment can be compacted to a maximum dry density of 122.8 pcf at an optimum moisture content of 12.5%.

VI. SLOPE STABILITY ANALYSIS

A computer program, entitled "STABL2", was utilized for the analyses of the embankment slope stability for the sedimentation ponds considered. The STABL2 was originally developed in 1975 by R.A. Siegel, and subsequently revised in 1978 by E. Boutrup of Purdue University for the Indiana State Highway Dept. This program analyzes the slope stability by adapting the Modified Bishop Method using the limiting equilibrium procedure to obtain the value of the factor of safety.

As-built drawings were not available for the sedimentation ponds considered. Thus, for analysis purposes, a most critical cross-section of the embankment of each pond were visually determined, generally near the center of each embankment, and its geometrical dimensions including slopes and heights determined by a pocket transit and visual estimates (Drawings 3 to 11). These dimensions were not surveyed and should be considered as approximate. The soil profile of each cross-section was

determined by the data obtained from the drilling program and from the laboratory testing results. The original natural ground lines were constructed by interpolating or extrapolating from the existing natural ground lines upstream and downstream of the ponds, and from topographic data.

Three cases were investigated for each cross-section, namely: 1) full pool condition, 2) rapid drawdown condition, and 3) dry pool condition. For each case, analyses were made both with and without earthquake loading. A horizontal acceleration equivalent to 10% of the gravitational acceleration was applied on the embankments for their analysis under seismic situation. The full pool was taken to be at 6 ft below the crest of each embankment since the overflow shafts are set at this elevation for each pond. The embankment fill materials for all three ponds contain a substantial amount of granular materials, such as silts, sands, gravels, cobbles and large sandstone boulders, therefore, it was assumed that the pore water pressure would not build up under either the full pool or the rapid drawdown conditions.

For the slope stability analyses, the following soil parameters were used:

	Soil Layer	Unit Wt., pcf γm	Unit Wt., pcf γsat	ϕ, degrees	c, psf
Pond No. 1	Fill material	110	125	38	0
	Natural soil	115	125	40	0
Pond No. 3	Silty, Sandy Fill	110	125	36	0
	Clayey Fill	115	130	32	800
	Natural soil	110	125	40	0
Pond No. 5	Fill Material	120	130	34	500
	Natural soil	115	130	40	0

The most critical potential failure surfaces of each embankment under various conditions are superimposed onto its cross section as shown in Drawings 3 to 11. The minimum factors of safety of the most critical potential failure surfaces of

each embankment are summarized in Table 1. The output of the STABL 2 program for the Pond No. 1 embankment under full pool, and without seismic load imposed, is included in Appendix C. Due to the volume of printout material involved, the remainder of the computer output for the embankments under various conditions are not presented herein, but are available on file.

VII. CONCLUSIONS

According to the results obtained from the embankment slope stability analyses, Sedimentation Ponds Nos. 3 and 5 appear to be fairly stable, although the factors of safety against slope failure under seismic condition are marginal.

Pond No. 1 appears to be the least stable. The factors of safety against embankment failure are marginal under static load conditions, while the factors of safety under a seismic loading condition are less than one, indicating the embankment for Pond No. 1 would most likely not be able to withstand an earthquake with a resulting horizontal acceleration of greater than 10% of the gravitational acceleration at the site area.

To improve the factors of safety of the embankments, especially for Pond No. 1, the downstream slope of the embankment should be flattened or an earth-fill berm should be placed at the toe of the embankment equivalent to one-third the overall vertical height of the embankment.

Prepared by:

LaMonte Sorenson
Senior Engineering Geologist

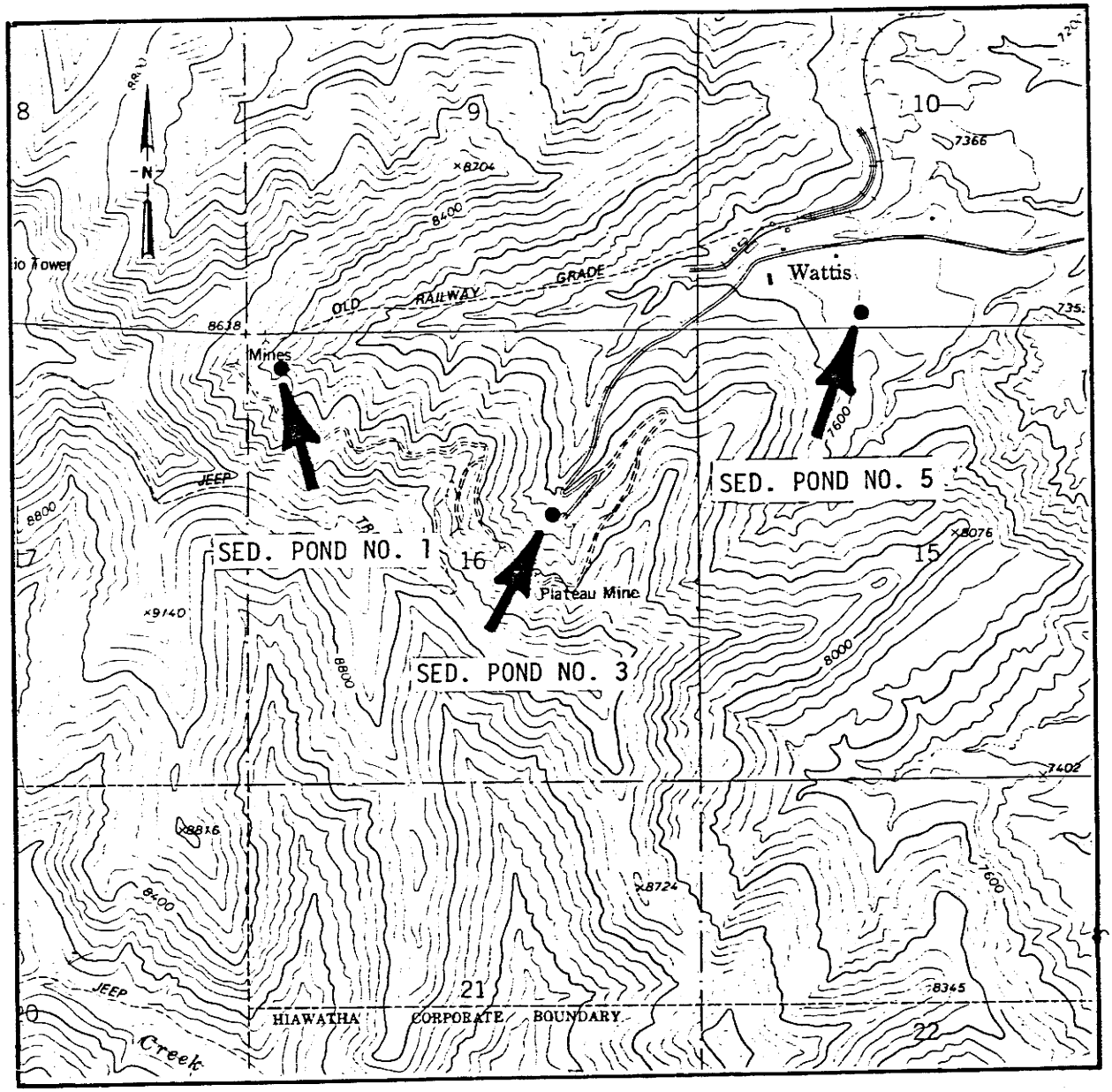
J.S. Liu
Senior Geotechnical Engineer

Reviewed by:

Larry Migliaccio
Director

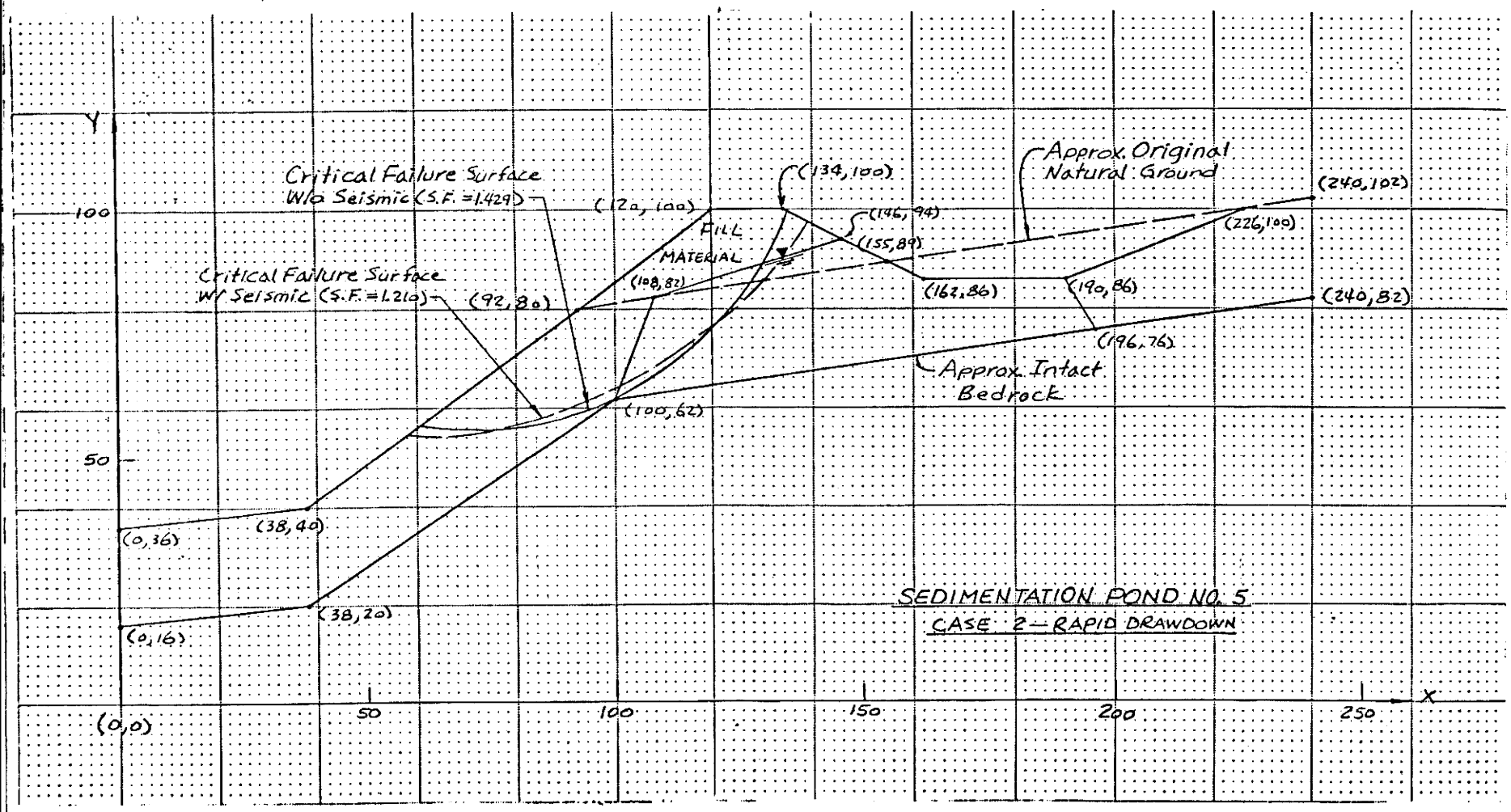
TABLE 1. MINIMUM FACTORS OF SAFETY AGAINST SLOPE FAILURE FOR SEDIMENTATION POND EMBANKMENT

		Pond No. 1	Pond No. 3	Pond No. 5
Full Pool	w/o Seismic	1.090	1.238	1.356
	w/ Seismic	0.893	1.042	1.140
Rapid Drawdown	w/o Seismic	1.090	1.238	1.429
	w/ Seismic	0.893	1.042	1.210
Dry Pool	w/o Seismic	1.090	1.238	1.577
	w/ Seismic	0.893	1.042	1.294



DWN. LES	R&M CONSULTANTS, INC. ENGINEERS GEOLOGISTS PLANNERS SURVEYORS	VICINITY MAP SEDIMENTATION PONDS 1, 3 and 5 PLATEAU MINING CO.	F.B.
CKD. JSL			GRID.
DATE. Oct. 81			PROJ. NO. 161024
SCALE. 1" = 2000'			DWG. NO. 1

ATTACHMENT #4



SEDIMENTATION POND NO. 5
CASE 2 — RAPID DRAWDOWN

PLATEAU MINING CO.
WATTIS, UTAH

R&M CONSULTANTS, INC.

JSL

DATE 11-10-81
SCALE 1" = 20'

F.B.
SHEET
PROJ. NO. 161074
DWG. NO. 10

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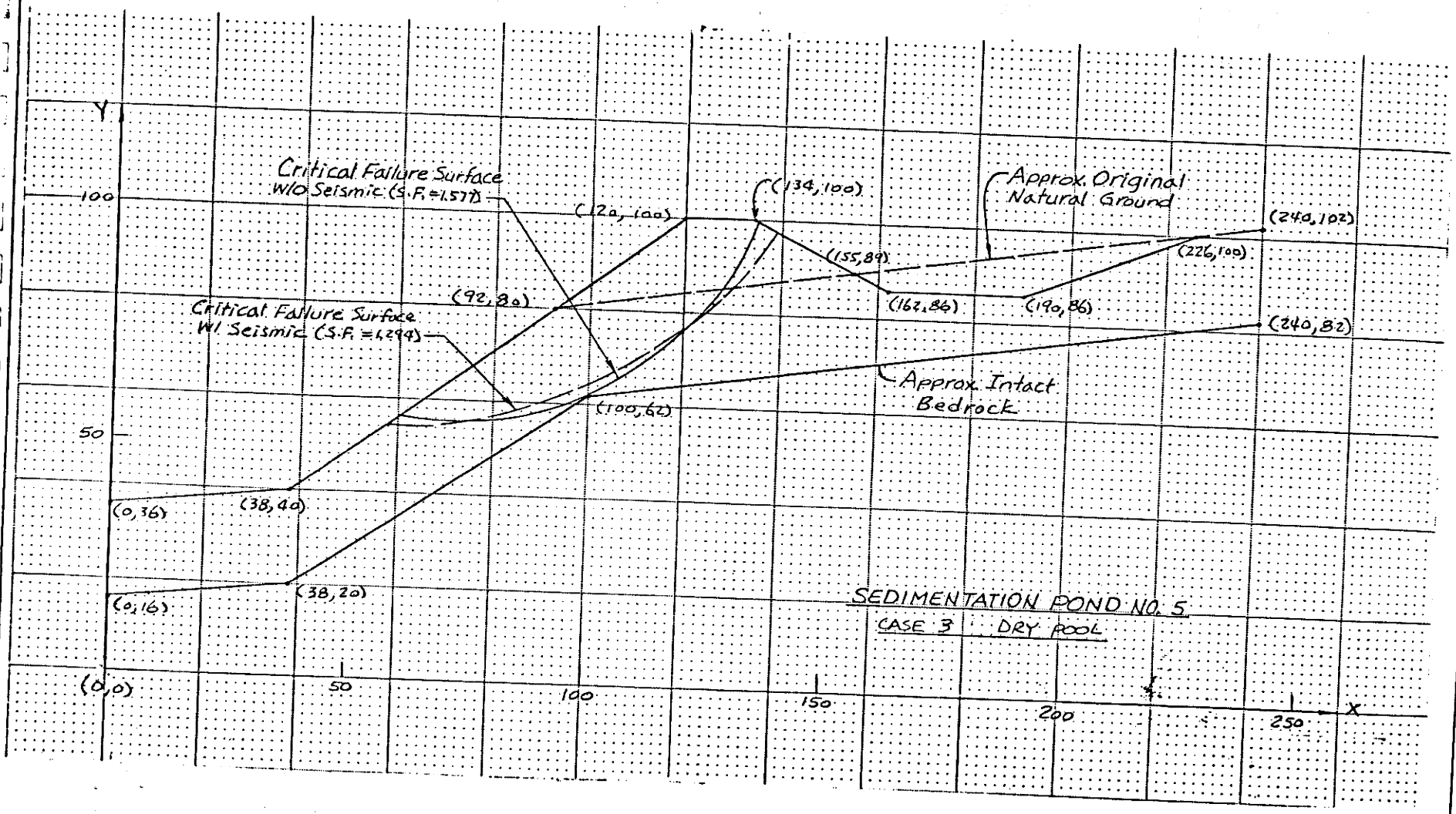


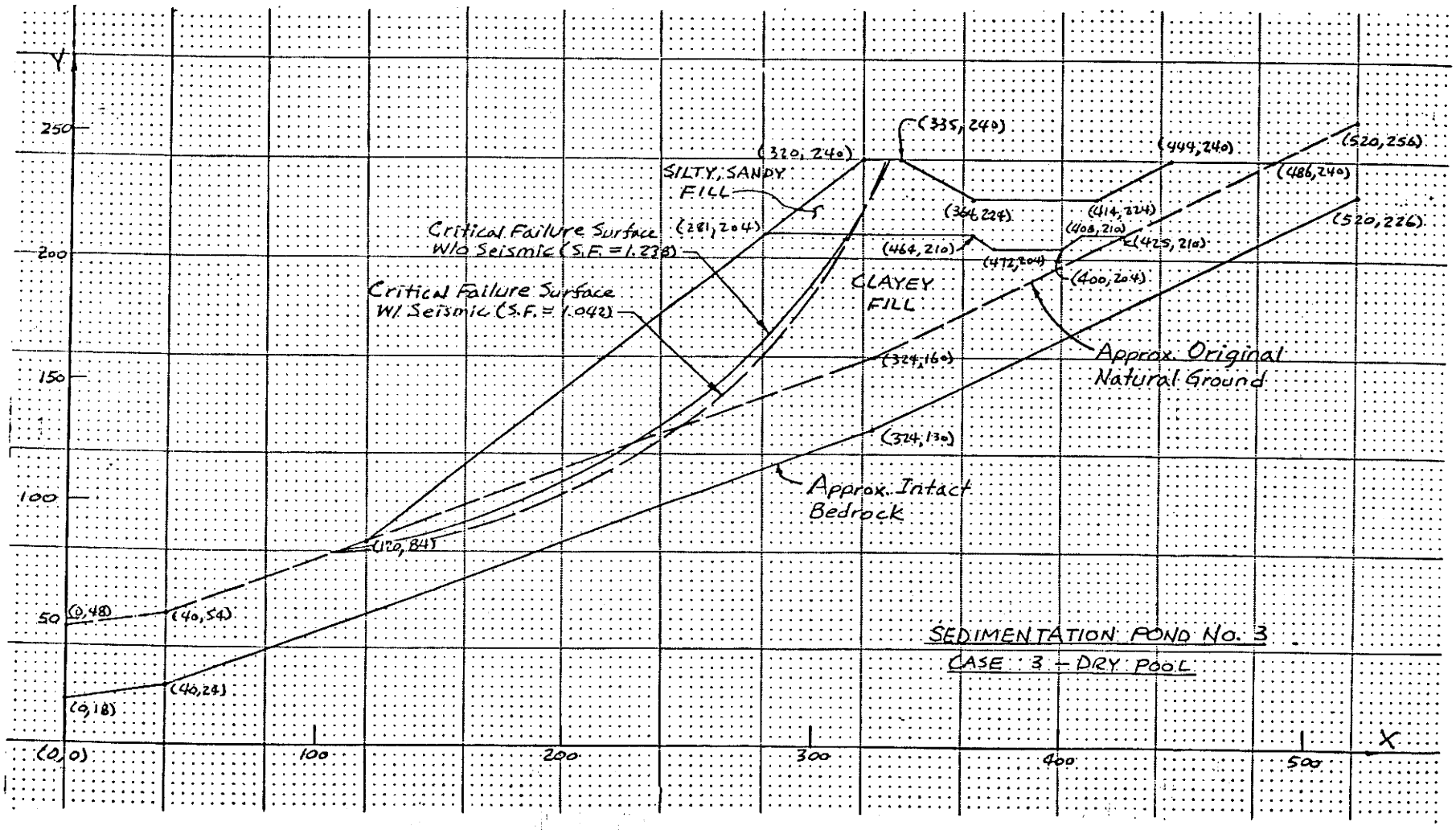
SEDIMENTATION POND NO. 5
CASE 3 DRY POOL

PLATEAU MINING CO.
WATTIS, UTAH

R&M CONSULTANTS, INC.

F.B.
SHEET
PROJ. NO. 6/1024
DWG. NO. 11

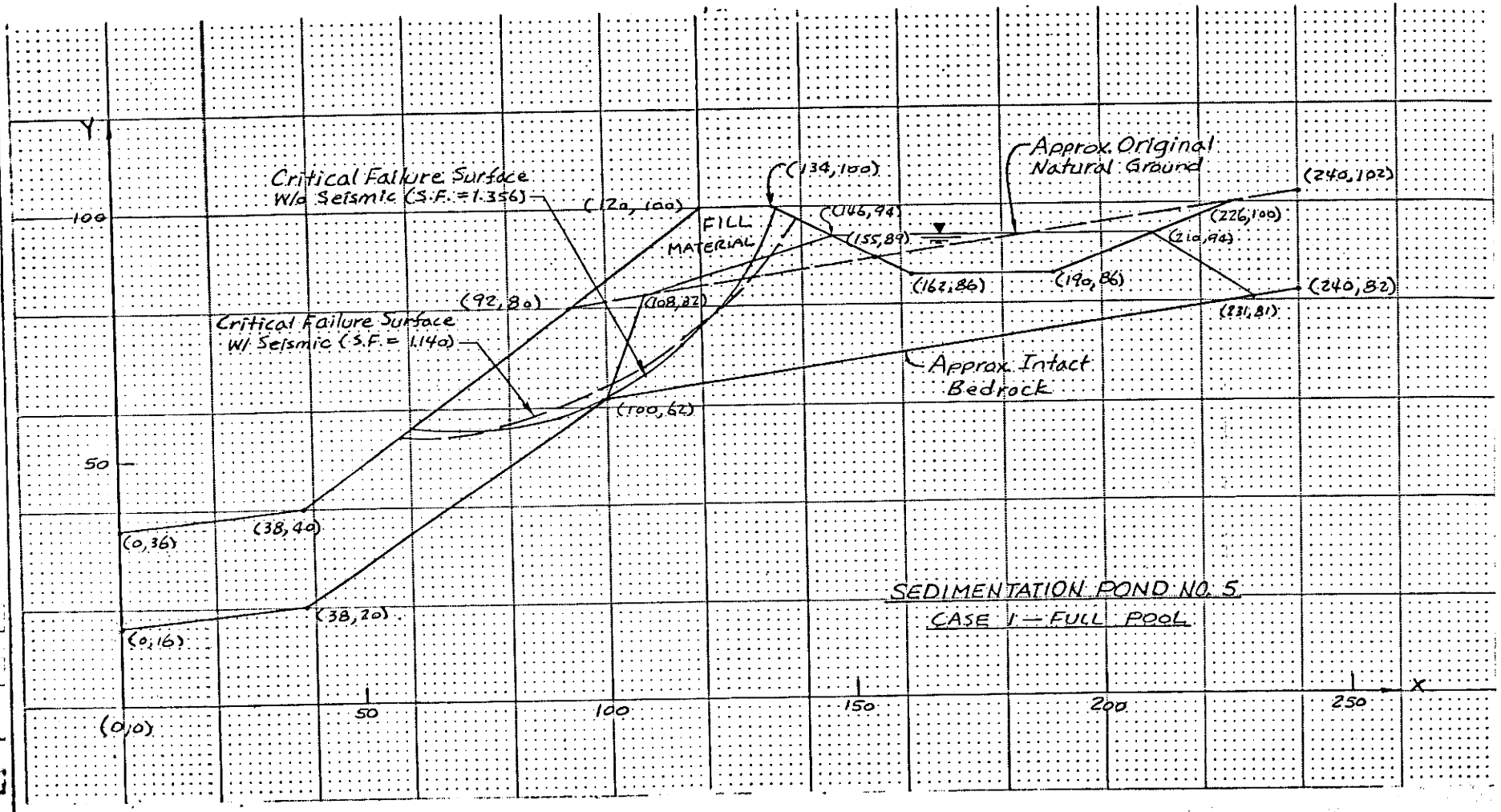
7-10-81
1" = 20'



PLATEAU MINING CO.
WATTIS, UTAH

R&M CONSULTANTS, INC.

11-10-81



SEDIMENTATION POND NO. 5
CASE 1 — FULL POOL

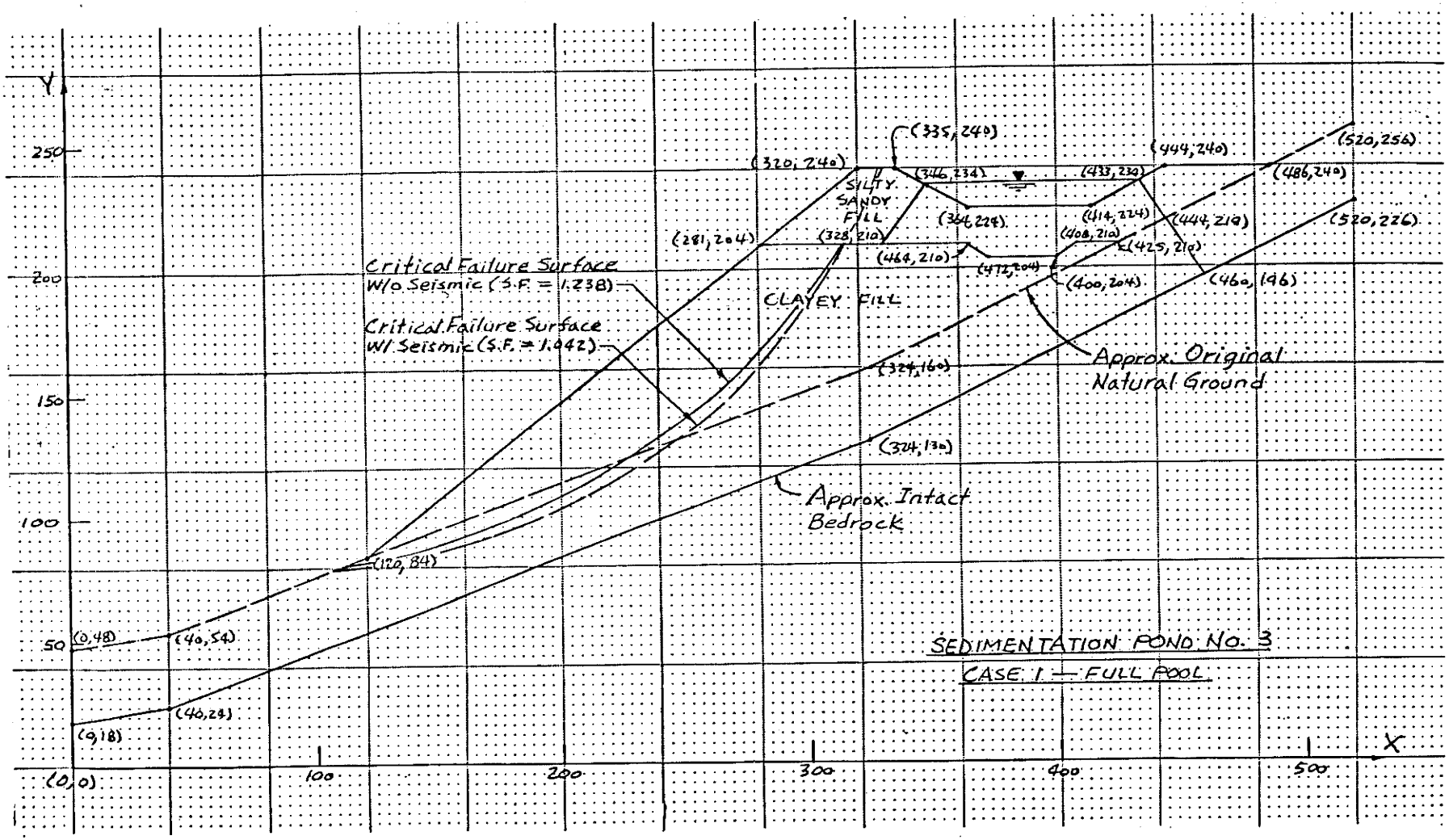
PLATEAU MINING CO.
WATTIS, UTAH

R&M CONSULTANTS, INC.

JSL
DATE 11-10-81
SCALE 1" = 20'

FB.
ENGR.
PROJ. NO. 161024
DWG. NO. 9

ATTACHMENT #4



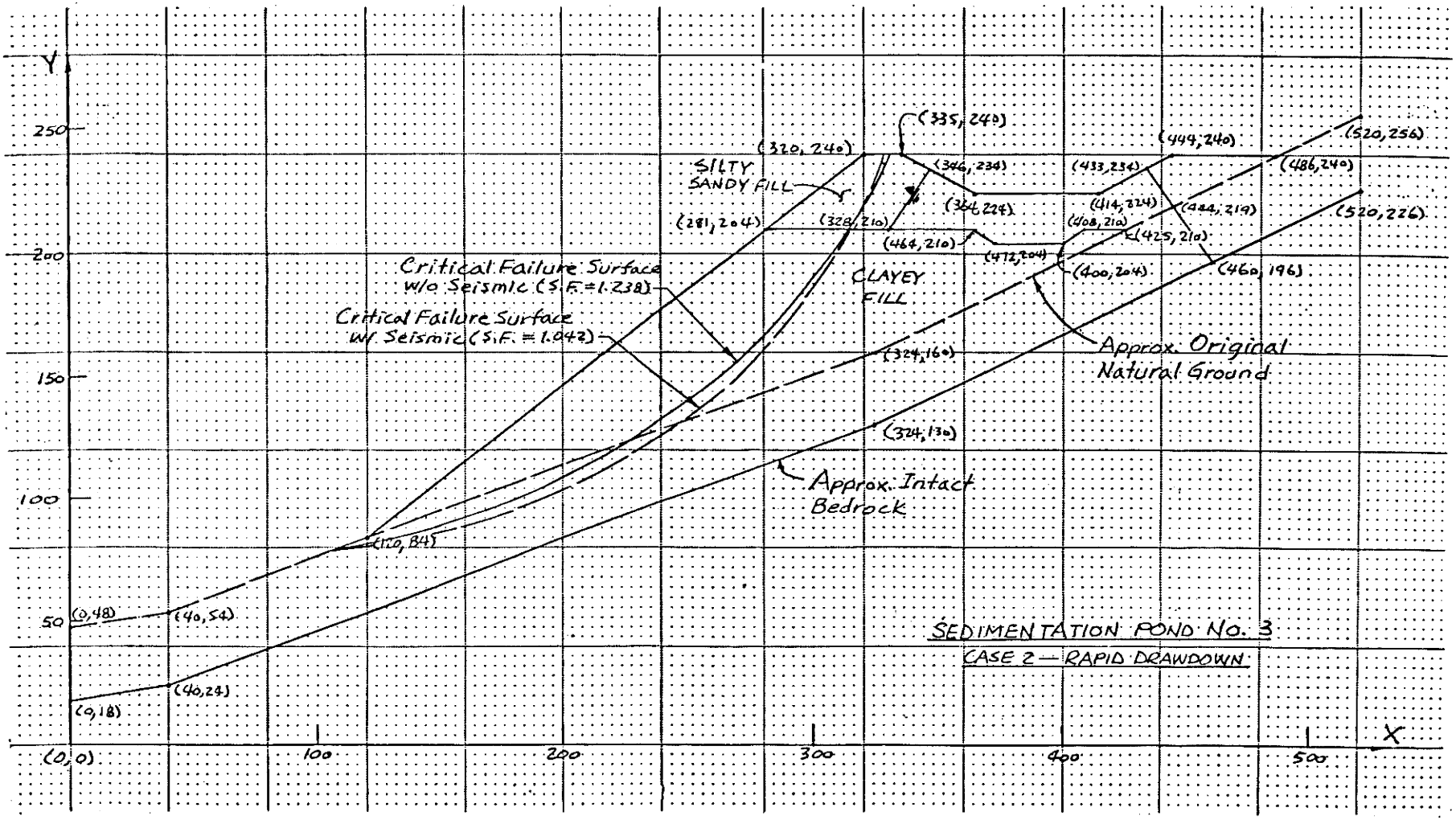
PLATEAU MINING CO.
WATTIS, UTAH

R&M CONSULTANTS, INC.

JSL
DATE 11-10-81
1" = 40'

F.B.
BKD.
PROJ. NO. 161024
DWG. NO. 6

ATTACHMENT #4



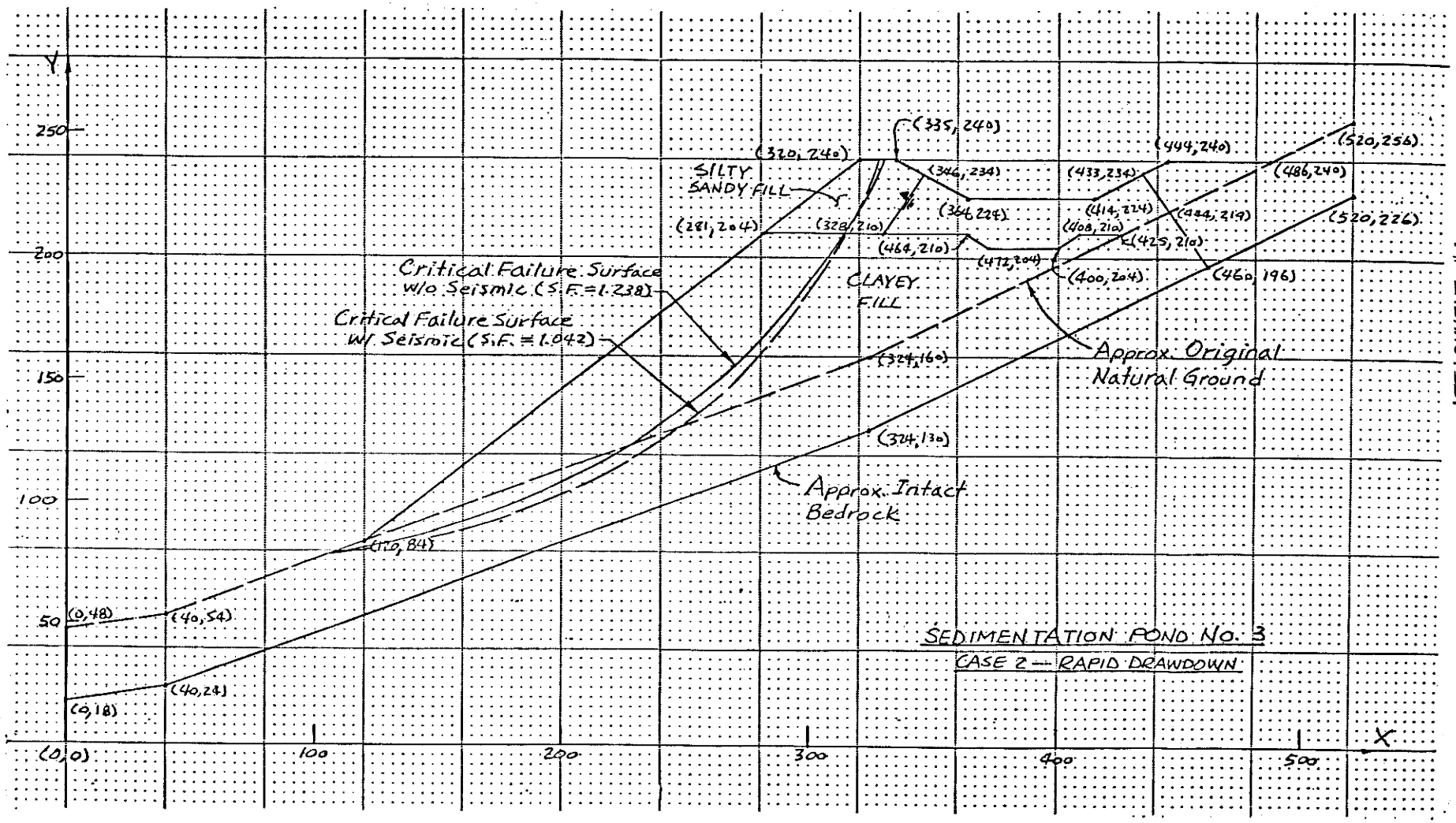
PLATEAU MINING CO.
WATTIS, UTAH

R&M CONSULTANTS, INC.

DR. JSL
CHK.
DATE 11-10-81
SCALE 1" = 40'

F.B.
BND.
PROJ. NO. 16 10 24
DWG. NO. 7

ATTACHMENT #4

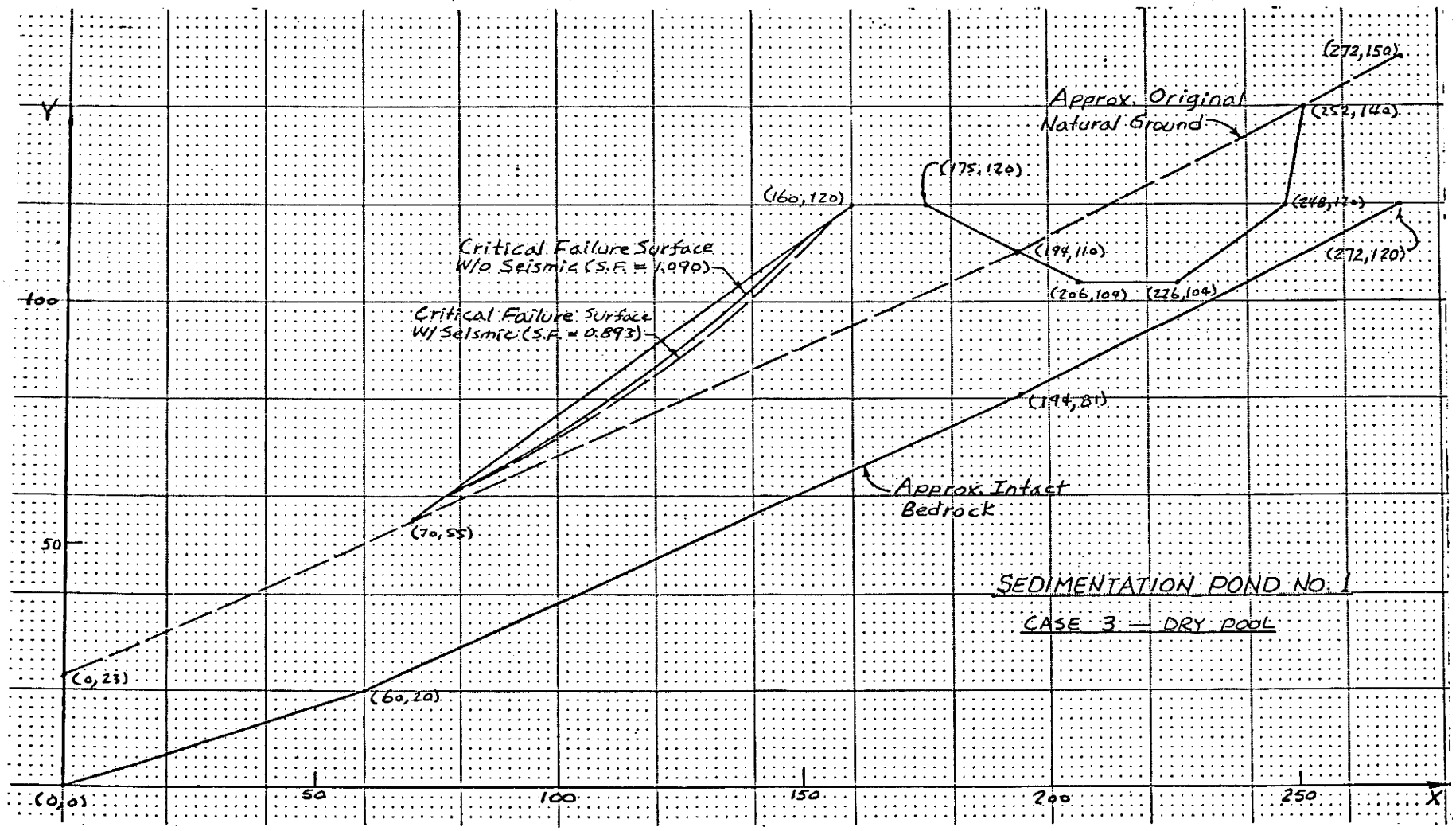


ATTACHMENT #4

PLATEAU MINING CO.

RSM

JSL



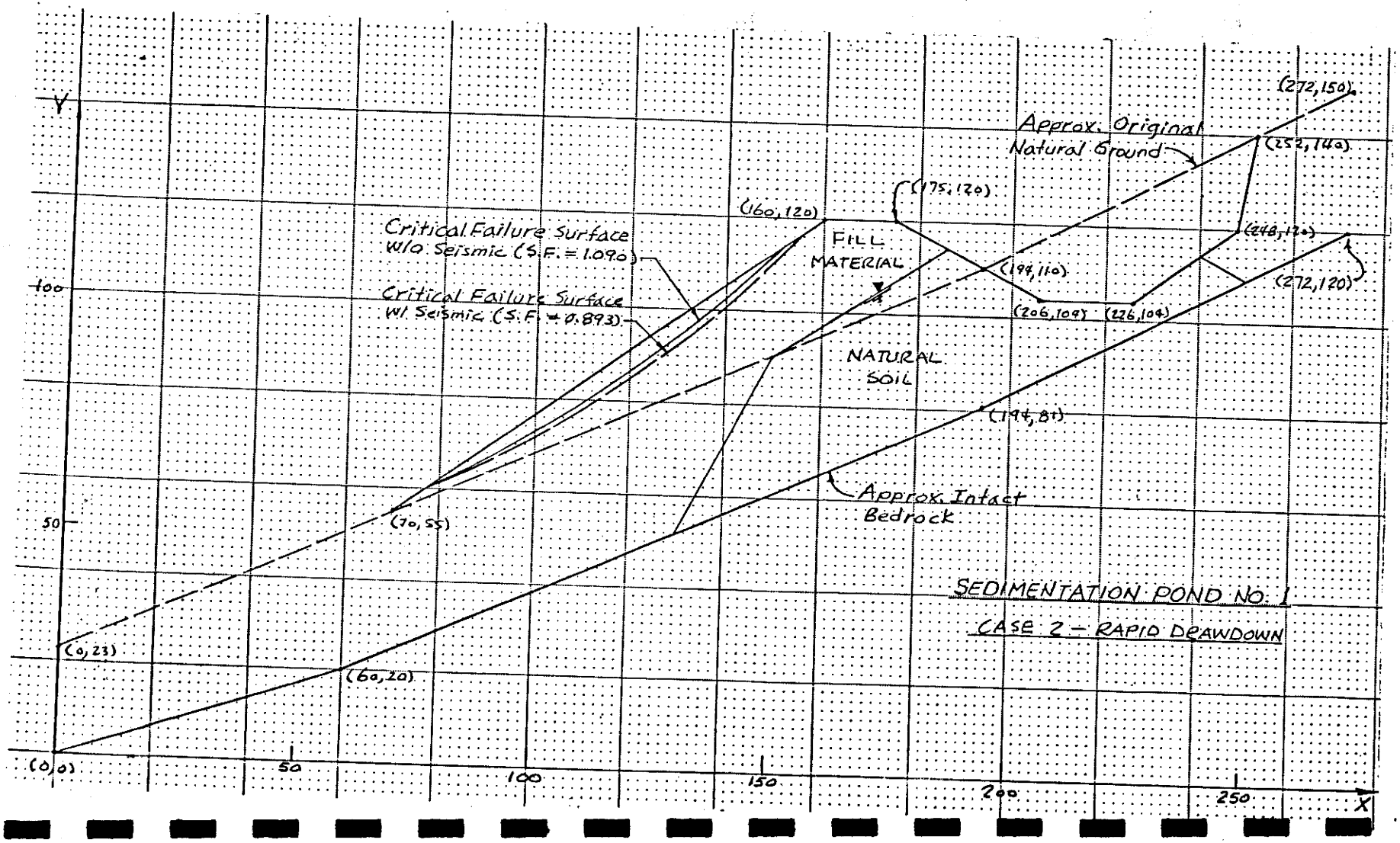
PLATEAU MINING CO.
WATTIS, UTAH

R&M CONSULTANTS, INC.

DWN. JSL
CKD.
DATE 11-10-81
SCALE 1" = 20'

F.B.
BND.
PROJ. NO. 161024
DWG. NO. 5

ATTACHMENT #4



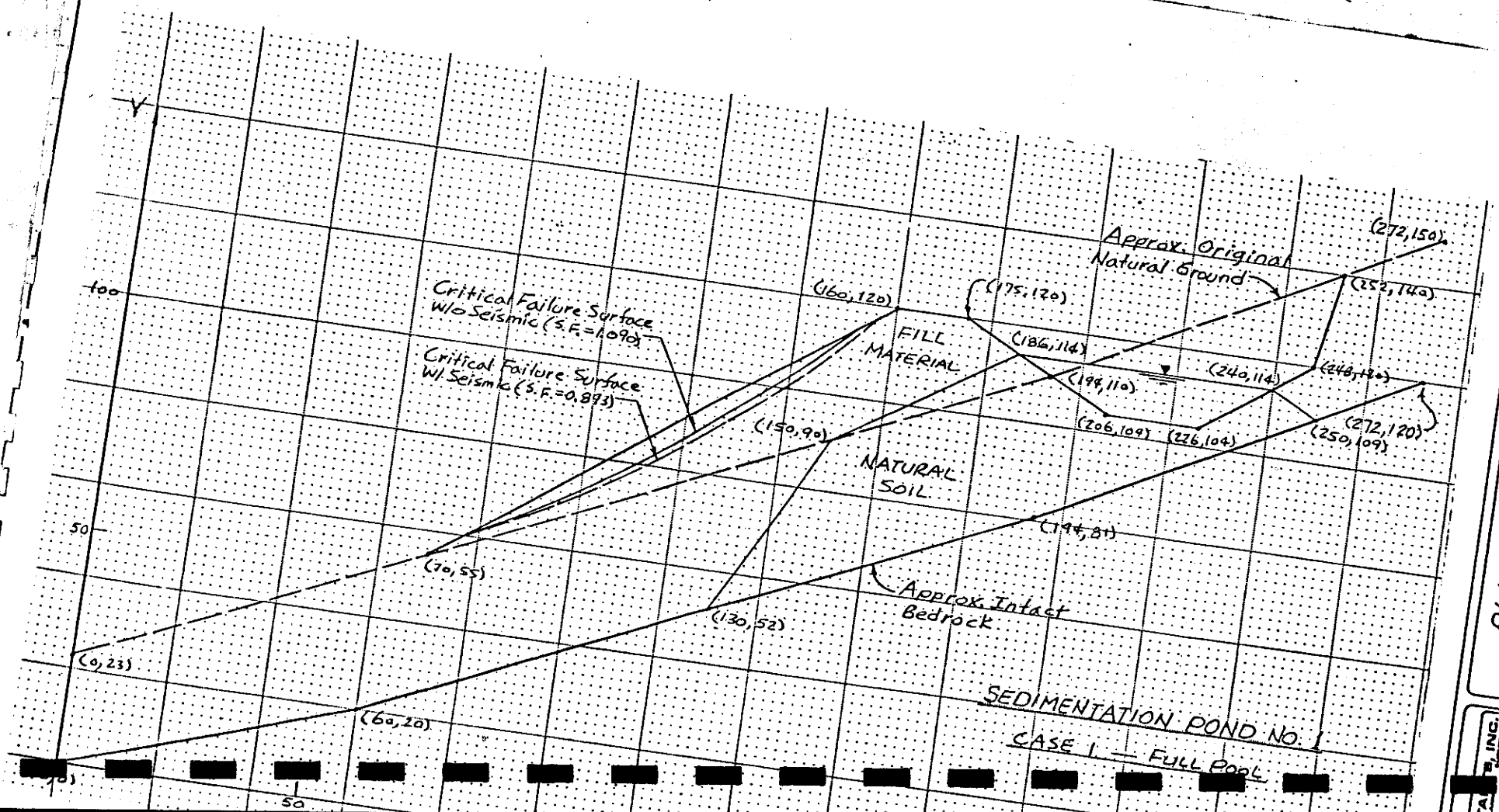
PLATEAU MINING CO.
WATTIS, UTAH

R&M CONSULTANTS, INC.

PROJ. NO. 161024
DWG. NO. 4

1-10-81
1" = 20'

ATTACHMENT #4

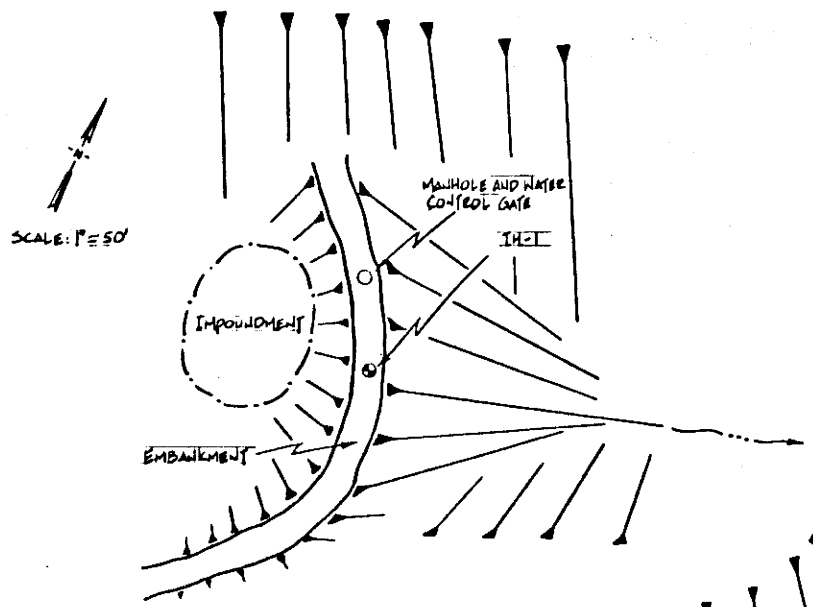


SEDIMENTATION POND NO. 1
CASE 1 — FULL POOL

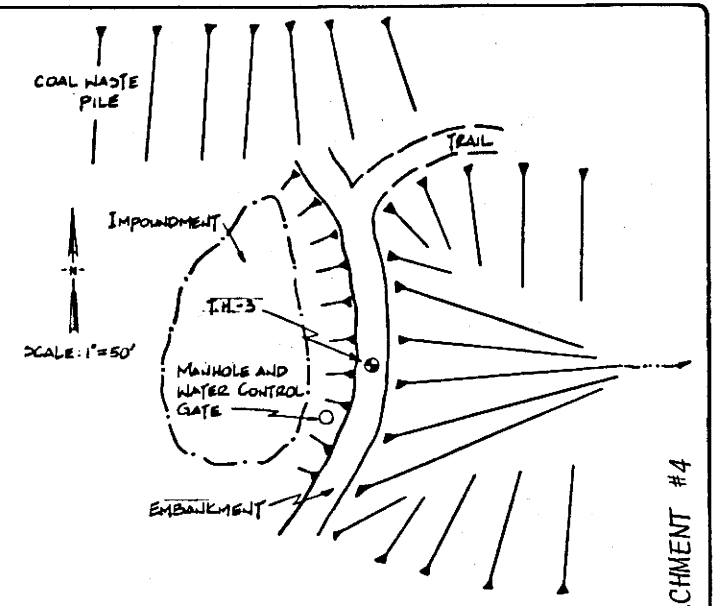
PLATEAU MINING CO.
WATTIS, UTAH

F.B.
BKG.
PROJ. NO. 161024
DWG. NO. 3

ATTACHMENT



SEDIMENTATION POND NO. 1



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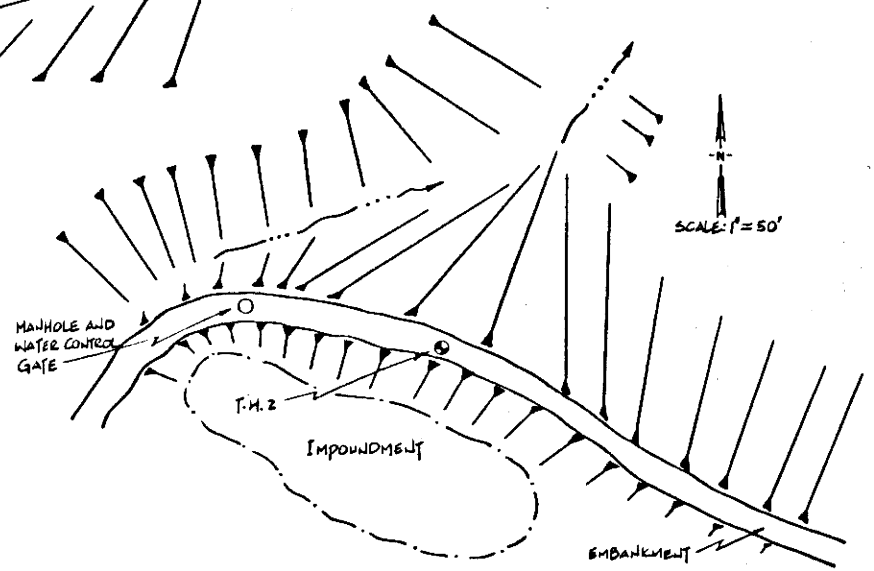


SEDIMENTATION POND NO. 3

ATTACHMENT #4

SITE AND TEST HOLE LOCATION PLAN
SEDIMENTATION PONDS 1, 3 & 5
PLATEAU MINING CO.

R&M CONSULTANTS, INC.

DRAWN	JKH
CHECKED	LGS
DATE	Oct 81
SCALE	

FILE
DWG
PROJ NO 161024
DRWG NO 2

APPENDIX A - BORING LOGS

ATTACHMENT #4

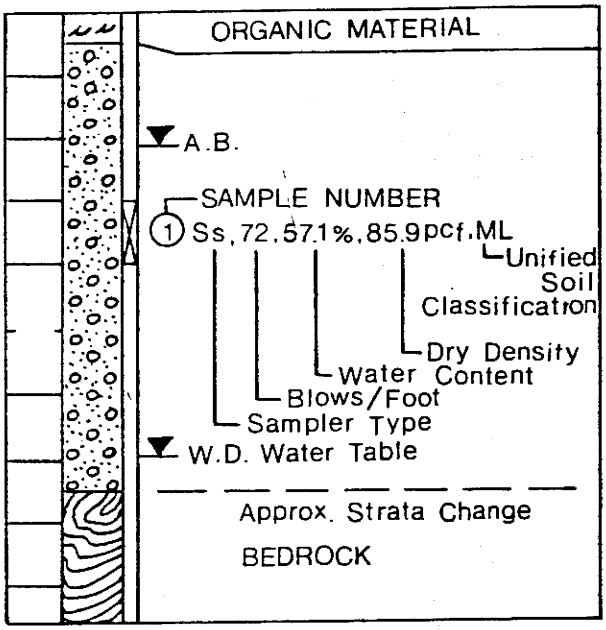
BORING NUMBER TH-1 Date Completed 10-1-81

Depth (ft)	Soil Graph	Location Sampled	SOIL DESCRIPTION
		1	Ss, 55, GM FILL (FINE SAND & SILT) w/gravel, cobbles of fine grained sandstone-high BPF due to rock-intervening, soil is med. dense, moist, dark brown
5		2	Ss, 20, GM same, occasional trace of visible moisture. Material drills easily but erratic due to rock.
			FILL (COAL - silt to gravel size)
10		3	Sl, 30, GM Fill, no recovery-sampler blocked by rock.
		4	Sl, 16, 9.7%, 89.2 pcf, GM Tr. to some fine sand & silt, few sandstone chips, med. dense,
		5	Ss, 17, GM moist, black. PP=2.0Tft²
15		6	Ss, 11, GM Same, but increase in % of silt & fine sand. Drills easily, uniformly
20		7	Ss, 8, GM, same, but loose Drills easily, uniformly
			APPROXIMATE NATURAL GROUND SURFACE
25			

LOCATION SKETCH No Scale

Note: Distances Shown Are Approximate And Have Not Been Measured by Surveying Methods.

EXPLANATION



W.D.-While Drilling
A.B.- After Boring

TYPICAL SOIL LOG

Ss 1.4" Split Spoon With 140 lb. Hammer (30" F.F.)
Sz 1.4" Split Spoon With 340 lb. Hammer (12" F.F.)
Sl 2.5" Split Spoon With 140 lb. Hammer (30" F.F.)
Sp 2.5" Split Spoon, Pushed
A Auger Sample
Ts Shelby Tube
Tm Modified Shelby Tube
Bs Bulk Sample
PP=qu by pocket penetrometer

SAMPLE TYPE SYMBOLS

Organic Material
Clay
Silt
Sand
Gravel
Cobbles & Boulders
Bedrock, weathered
Man-made fill

SOIL SYMBOLS

DWN.	LGS
CKD.	JSL
DATE.	10/12/81
SCALE.	

R&M CONSULTANTS, INC.
ENGINEERS GEOLOGISTS PLANNERS SURVEYORS
SOIL LOG

PLATEAU MINING CO.
SEDIMENTATION POND NO. 1

FB.	
GRID.	
PROJ.NO.	161024
DWG.NO.	A1-1

ATTACHMENT #4

BORING NUMBER TH-1 Date Completed 10/1/81

Depth (ft)	Soil Graph	Location Sampled	SOIL DESCRIPTION
		8	Sl, 44, 9.8%, 103.0 pcf, GM BEDROCK - HIGHLY WEATHERED to decomposed
		9	Ss, 20, GM Silt and fine sand w/ 30% med. gray, fine grained sandstone fragments, visible moisture on partings common, med. dense, very moist, gray and brown
30		10	Ss, 13, GM SAME but very moist to wet, medium brown Drills moderately easy-occasionally erratic
35		11	Ss, 11, GM SAME - sampler blocked off by rock, 6" Rec., loose to med. dense, slightly moist, light gray
40		12	Ss, 24, GM SAME but med. dense and light tan

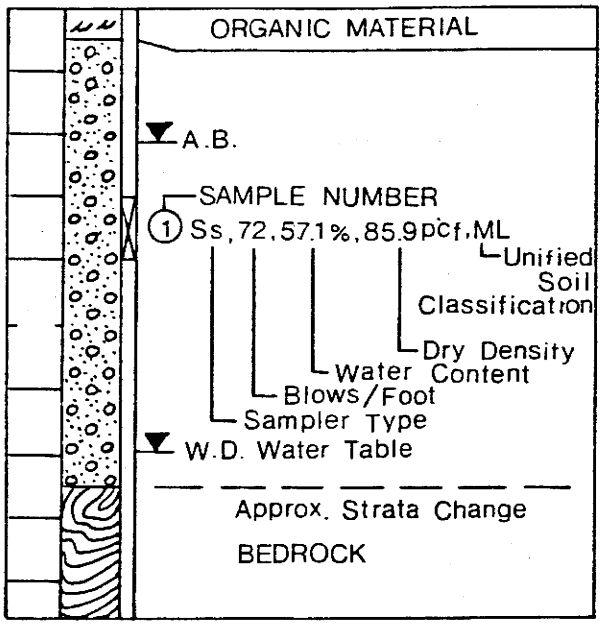
Total Depth = 41.5 ft

Piezometer installed to total depth w/bottom 10 ft slotted & gravel packed in annular space.

LOCATION SKETCH No Scale

Note: Distances Shown Are Approximate And Have Not Been Measured by Surveying Methods.

EXPLANATION



W.D.-While Drilling
A.B.- After Boring

TYPICAL SOIL LOG

Ss 1.4" Split Spoon With 140 lb. Hammer (30" F.F.)
Sz 1.4" Split Spoon With 340 lb. Hammer (12" F.F.)
Sl 2.5" Split Spoon With 140 lb. Hammer (30" F.F.)
Sp 2.5" Split Spoon, Pushed
A Auger Sample
Ts Shelby Tube
Tm Modified Shelby Tube
Bs Bulk Sample

PP=qu by pocket penetrometer

SAMPLE TYPE SYMBOLS

Organic Material
Clay
Silt
Sand
Gravel
Cobbles & Boulders
Bedrock, weathered
Man-made fill

SOIL SYMBOLS

DWN.	LGS
CKD.	JSL
DATE.	10-12-81
SCALE.	

R&M CONSULTANTS, INC.
ENGINEERS GEOLOGISTS PLANNERS SURVEYORS

SOIL LOG

PLATEAU MINING CO.
SEDIMENTATION POND NO. 1

F.B.	
GRID.	
PROJ.NO.	161024
DWG.NO.	A1-2

ATTACHMENT #4

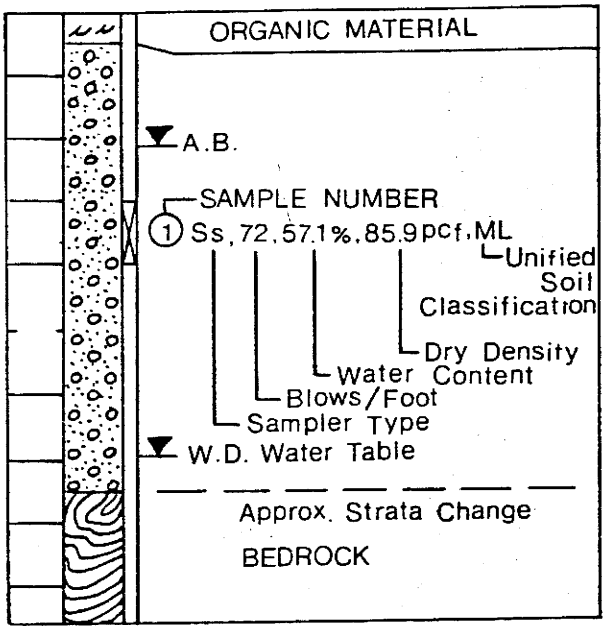
BORING NUMBER TH-2 Date Completed 10-2-81

Depth (ft)	Soil Graph	Location Sampled	SOIL DESCRIPTION
			FILL (SILT) w/fine sand, some gravel of coal & sandstone chips, med. dense, moist, med-dark gray.
		① Sl, 28, GM	
5		② Ss, 8, GM	same, trace clay, loose, slightly moist, gray & brown. sandstone slab 7-8' occasional large cobbles
10		③ Ss, 13, GM	same, trace clay, decrease to trace gravel, med. dense, moist, light gray. Material drills easily except for occasional large cobbles
15		④ Sl, 30, GM	Increase in gravel to +50%, decrease in silt-fine sand, sampler blocked off by rock-recovery=8" PP=2.0Tft²
		⑤ Sl, 27, GM	Decrease in gravel to 50% w/silt & fine sand, medium dense, dry, light gray
20		⑥ Ss, 9, GM	Decrease in gravel to 30%, trace clay, loose, slightly moist, med. gray PP=1.2Tft² Material drills easily
25			

LOCATION SKETCH No Scale

Note: Distances Shown Are Approximate And Have Not Been Measured by Surveying Methods.

EXPLANATION



W.D.-While Drilling
A.B.-After Boring

TYPICAL SOIL LOG

Ss 1.4" Split Spoon With 140 lb. Hammer (30" F.F.)
Sz 1.4" Split Spoon With 340 lb. Hammer (12" F.F.)
Sl 2.5" Split Spoon With 140 lb. Hammer (30" F.F.)
Sp 2.5" Split Spoon. Pushed
A Auger Sample
Ts Shelby Tube
Tm Modified Shelby Tube
Bs Bulk Sample
PP=q_u by Pocket Penetrometer

SAMPLE TYPE SYMBOLS

Organic Material
Clay
Silt
Sand
Gravel
Cobbles & Boulders
Bedrock, weathered
Man-made Fill

SOIL SYMBOLS

DWN.	LGS
CKD.	JSL
DATE.	10/12/81
SCALE	

R&M CONSULTANTS, INC.
ENGINEERS GEOLOGISTS PLANNERS SURVEYORS

SOIL LOG

PLATEAU MINING CO.
SEDIMENTATION POND NO. 3

EB.	
GRID.	
PROJ.NO.	161024
DWG.NO.	A2-1

ATTACHMENT #4

BORING NUMBER TH-2 Date Completed: 10-2-81

Depth (ft)	Soil Graph	Location Sampled	SOIL DESCRIPTION
		7	Sl, 14, 11.1%, 97.7 pcf, GM Same, but w/trace of visible moisture, med. dense, moist to very moist, medium gray.
			FILL (CLAY)
30		8	Sl, 60 CL-GC w/silt, tr. to some sand, few rock and coal chips, stiff, moist, dark gray-brown PP=2.8Tft²
		9	Ss, 14, CL-GC Same
35		10	Ss, 46, CL-GC Same, but increase in rock (gray siltstone), (high BPF due to sampler blocked off by rock).
40		11	Ss, 13, CL-GC Same, w/decrease in rock, few coal chips, stiff, moist, gray PP=1.5Tft²
45		12	Ss, 29, CL-GC Same, only 4" recovery due to sampler blocking off by rock.

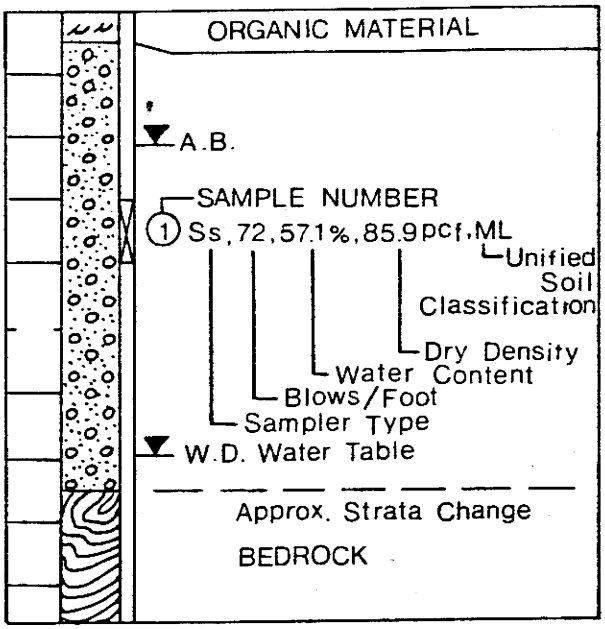
TOTAL DEPTH = 46.5 ft

Piezometer installed w/bottom 20 ft slotted and gravel packed in annular space.

LOCATION SKETCH — No Scale

Note: Distances Shown Are Approximate And Have Not Been Measured by Surveying Methods.

EXPLANATION



W.D.-While Drilling
A.B.- After Boring

TYPICAL SOIL LOG

Ss 1.4" Split Spoon With 140 lb. Hammer (30" F.F.)
Sz 1.4" Split Spoon With 340 lb. Hammer (12" F.F.)
Sl 2.5" Split Spoon With 140 lb. Hammer (30" F.F.)
Sp 2.5" Split Spoon, Pushed
A Auger Sample
Ts Shelby Tube
Tm Modified Shelby Tube
Bs Bulk Sample

PP=q_u by Pocket Penetrometer

SAMPLE TYPE SYMBOLS

Organic Material
Clay
Silt
Sand
Gravel
Cobbles & Boulders
Bedrock, weathered
Man-made Fill

SOIL SYMBOLS

DWN. LGS	
CKD. JSL	
DATE. 10-12-81	
SCALE	

R&M CONSULTANTS, INC.
ENGINEERS GEOLOGISTS PLANNERS SURVEYORS

SOIL LOG

PLATEAU MINING CO.
SEDIMENTATION POND NO. 3

FB.	
GRID.	
PROJ.NO.	161024
DWG.NO.	A2-2

ATTACHMENT #4

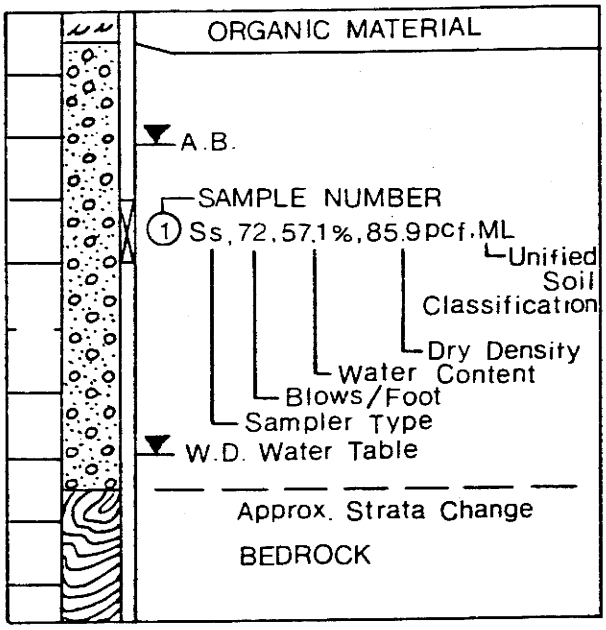
BORING NUMBER TH-3 Date Completed 10-2-81

Depth (ft.)	Soil Graph	Location Sampled	SOIL DESCRIPTION
			FILL (CLAY) w/silt and fine sand, trace to some gravel as sandstone chips,
		1	Ss, 13, SC-GC stiff to med. dense, moist, light brown.
5		2	Sl, 29, 9.8%, 124.2 pcf, SC-GC same, increase in gravel to 40%, few coal chips. PP=3.6Tft²
		3	Ss, 12, SC-GC same, decrease in gravel.
10		4	Ss, 26 same, w/silt & fine sand, 40% gravel as coal and rock chips, stiff to med. dense, slightly moist, med. brown. (High BPF due to rock).
			APPROXIMATE NATURAL GROUND SURFACE
15		5	Sl, 58, 5.9%, 101.4 pcf, GM BEDROCK, HIGHLY WEATHERED Sandstone, fine grained to silty, closely jointed w/silt-fine sand in partings, hard, dry to slightly moist, light brown, buff and occasional red.
		6	Ss, 41, GM
20		7	Ss, 45, GM SAME

LOCATION SKETCH No Scale

Note: Distances Shown Are Approximate And Have Not Been Measured by Surveying Methods.

EXPLANATION



W.D.-While Drilling
A.B.-After Boring

TYPICAL SOIL LOG

Ss 1.4" Split Spoon With 140 lb. Hammer (30" F.F.)
Sz 1.4" Split Spoon With 340 lb. Hammer (12" F.F.)
Sl 2.5" Split Spoon With 140 lb. Hammer (30" F.F.)
Sp 2.5" Split Spoon, Pushed
A Auger Sample
Ts Shelby Tube
Tm Modified Shelby Tube
Bs Bulk Sample
PP=q_u by Pocket Penetrometer

SAMPLE TYPE SYMBOLS

Organic Material
Clay
Silt
Sand
Gravel
Cobbles & Boulders
Bedrock, weathered
Man-made Fill

SOIL SYMBOLS

DWN.	LGS
CKD.	JSL
DATE.	10/19/81
SCALE.	

R&M CONSULTANTS, INC.
ENGINEERS GEOLOGISTS PLANNERS SURVEYORS

SOIL LOG

PLATEAU MINING CO.
SEDIMENTATION POND NO. 5

F.B.	
GRID.	
PROJ.NO.	161024
DWG.NO.	A3-1

ATTACHMENT #4

BORING NUMBER TH-3 Date Completed: 10-2-81

Depth (ft.)	Soil Graph	Location Sampled	SOIL DESCRIPTION
		8	Ss, Refusal - 23/1", GM SAME
		9	Ss, Refusal - 27/1", GM SAME

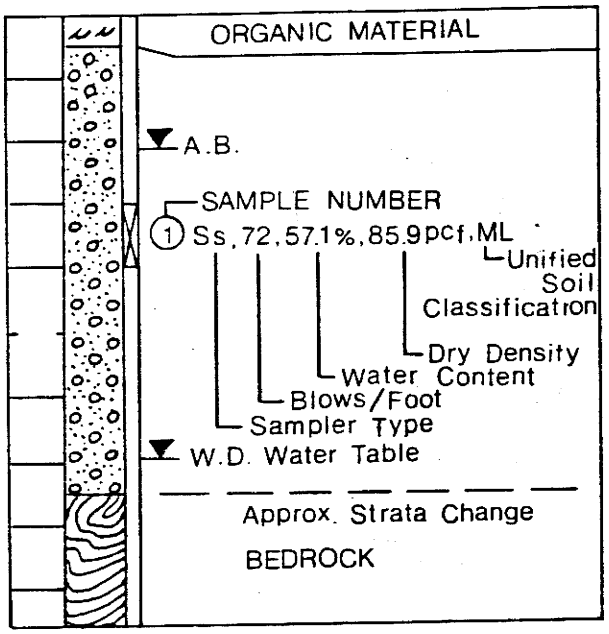
TOTAL DEPTH = 27 ft

Piezometer installed w/bottom 10' slotted, and gravel packed in annular space.

LOCATION SKETCH No Scale

Note: Distances Shown Are Approximate And Have Not Been Measured by Surveying Methods.

EXPLANATION



W.D.-While Drilling
A.B.- After Boring

TYPICAL SOIL LOG

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Sz 1.4" Split Spoon With 340 lb. Hammer (12" F.F.)
Sl 2.5" Split Spoon With 140 lb. Hammer (30" F.F.)
Sp 2.5" Split Spoon, Pushed
A Auger Sample
Ts Shelby Tube
Tm Modified Shelby Tube
Bs Bulk Sample

PP=q_u by Pocket Penetrometer

SAMPLE TYPE SYMBOLS

Organic Material
Clay
Silt
Sand
Gravel
Cobbles & Boulders
Bedrock, weathered
Man-made Fill

SOIL SYMBOLS

DWN.	LGS
CKD.	JSL
DATE.	10-19-81
SCALE.	

R&M CONSULTANTS, INC.
ENGINEERS GEOLOGISTS PLANNERS SURVEYORS

SOIL LOG

PLATEAU MINING CO.
SEDIMENTATION POND NO. 5

F.B.	
GRID.	
PROJ.NO.	161024
DWG.NO.	A3-2

ATTACHMENT #4

APPENDIX B - LABORATORY TEST RESULTS

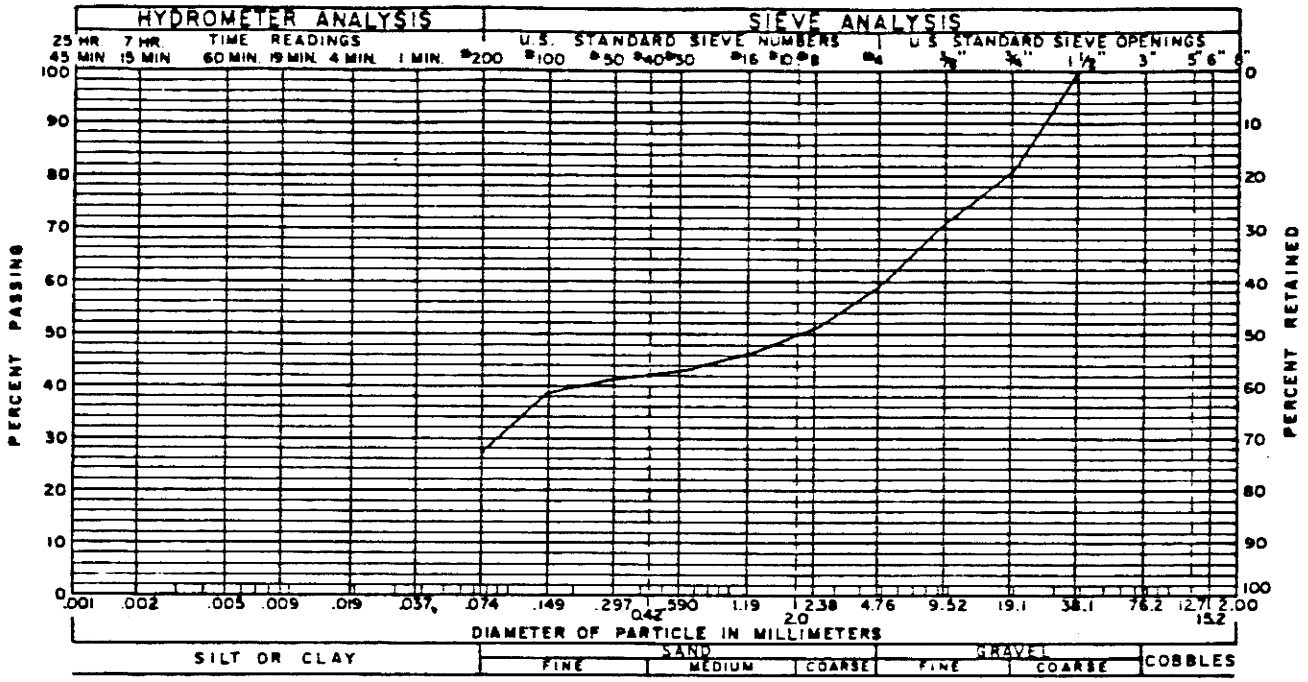
ATTACHMENT #4

TABLE B-1

SUMMARY OF LABORATORY TEST RESULTS

HOLE	DEPTH (FEET)	NATURAL MOISTURE (%)	NATURAL DRY DENSITY (PCF)	ATTERBERG LIMITS		UNCONFINED COMPRESSIVE STRENGTH (PSF)	% Passing		TRIAXIAL			SOIL TYPE
				LIQUID LIMIT (%)	PLASTICITY INDEX (%)		#4 Sieve	#200 Sieve	ø°	c, psf		
1-4	12-13.5	9.7	89.2									silty, sandy gravel
1-8	25-26.5	9.8	103.0									gravelly, silty sand
1-10	30-31.5	10.9					59.2	27.5				silty, sandy gravel
2-4	15-16.5	4.5										silty, sandy gravel
2-5	16.5-18	5.1					38.1	20.7				sandy, silty gravel
2-7	25-26.5	11.1	97.7									sandy, silty gravel
2-8	30-31.5	12.5		21.3	3.4							sandy, silty clay
2-11	40-41.5	7.5		21.4	3.9							sandy, silty clay
3-1	1-2.5	11.2		19.0	1.5							sandy, silty clay
3-2	5-6.5	9.8	124.2				75.1	40.9				gravelly sandy silt
3-5	15-16.5	5.9	101.4									silty, sandy gravel

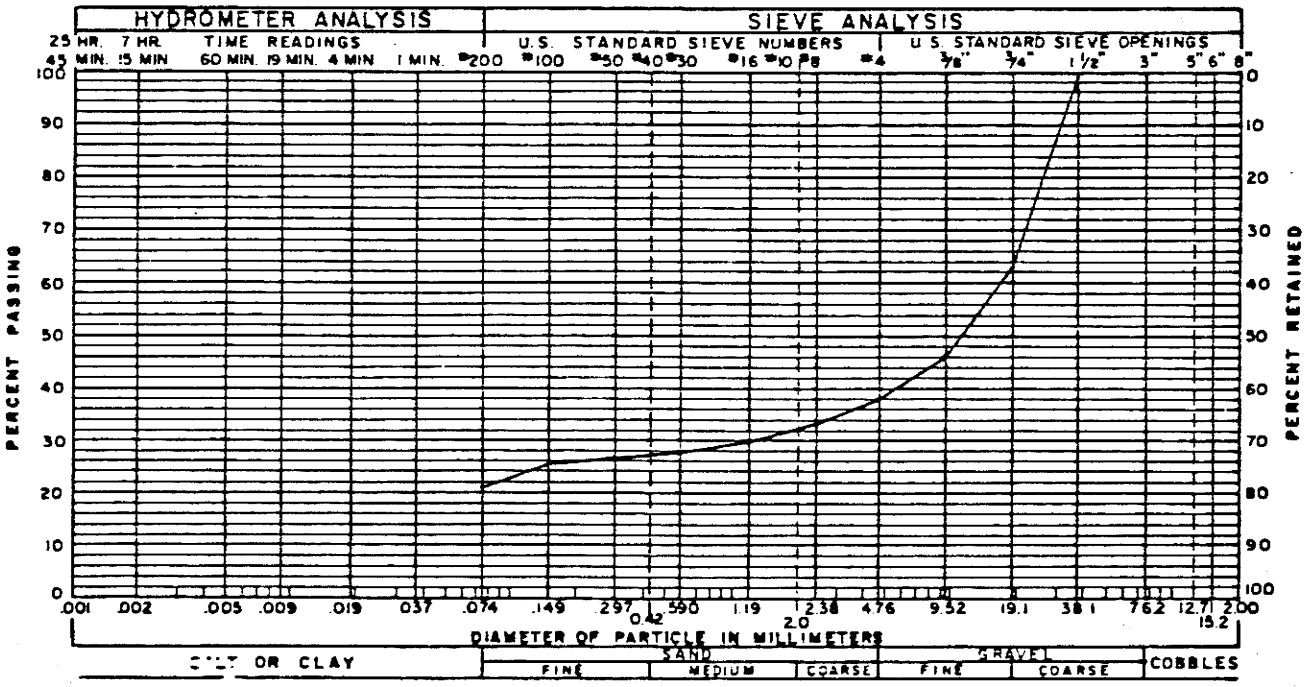
ATTACHMENT #4



GRAVEL 40.8 % SAND 31.7 % SILT AND CLAY 27.5 %

LIQUID LIMIT % PLASTICITY INDEX %

SAMPLE OF Silty sandy gravel FROM Test Hole 1-10 @ 30-31.5 feet



GRAVEL 61.9 % SAND 17.4 % SILT AND CLAY 20.7 %

LIQUID LIMIT % PLASTICITY INDEX %

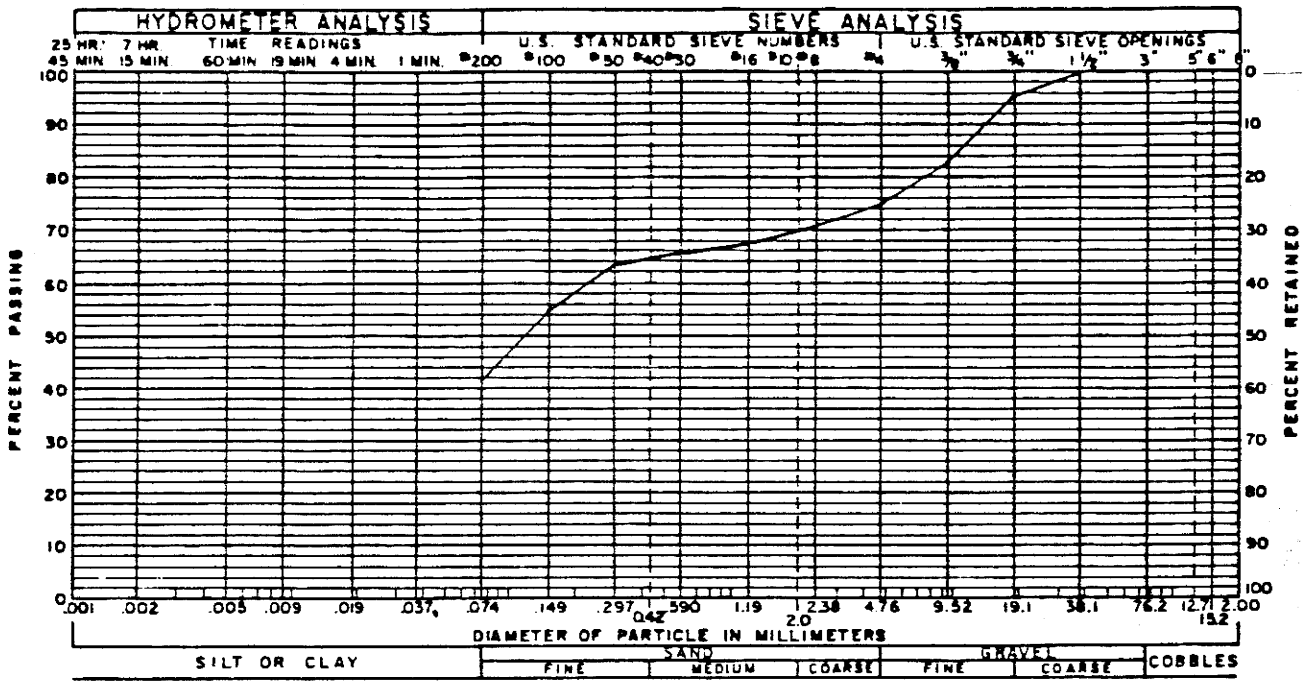
SAMPLE OF Sandy silty gravel FROM Test Hole 2-5 @ 16.5-18.0 feet

GRADATION TEST RESULTS

Job No. 161024

Figure B-1

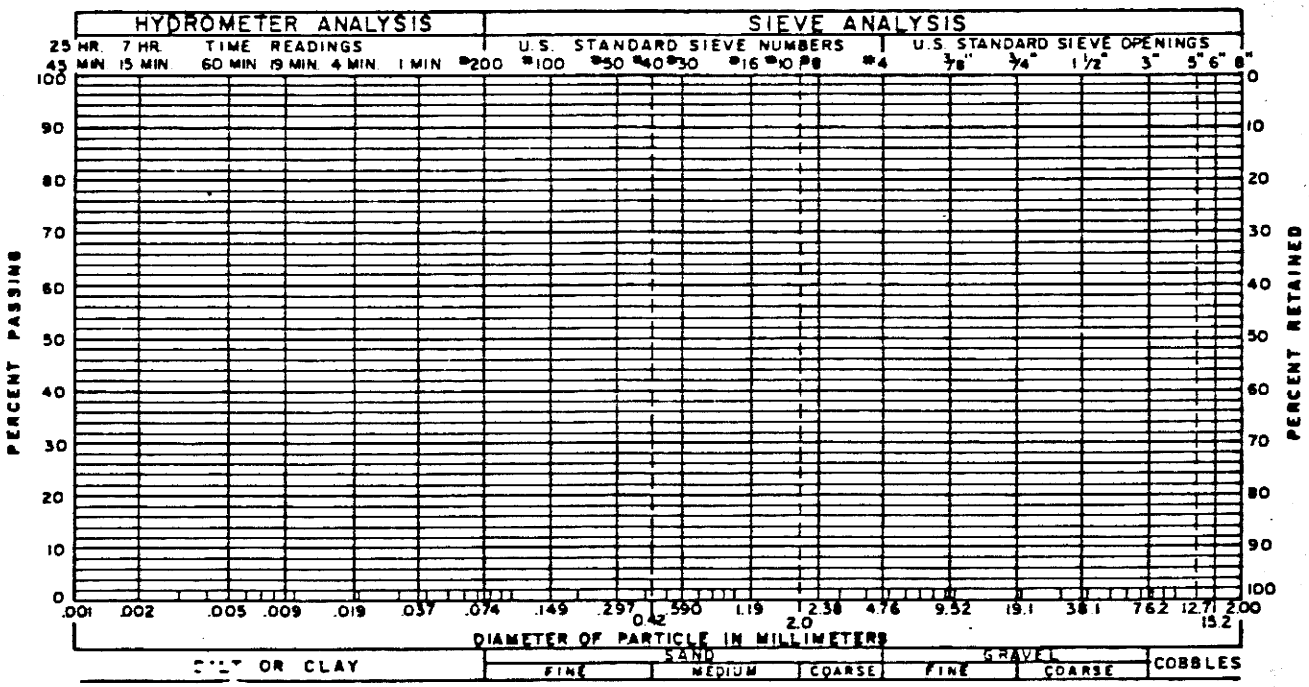
ATTACHMENT #4



GRAVEL 24.9 % SAND 34.2 % SILT AND CLAY 40.9 %

LIQUID LIMIT % PLASTICITY INDEX %

SAMPLE OF Gravelly sandy silt FROM Test Hole 3-2 @ 5-6.5 feet



GRAVEL % SAND % SILT AND CLAY %

LIQUID LIMIT % PLASTICITY INDEX %

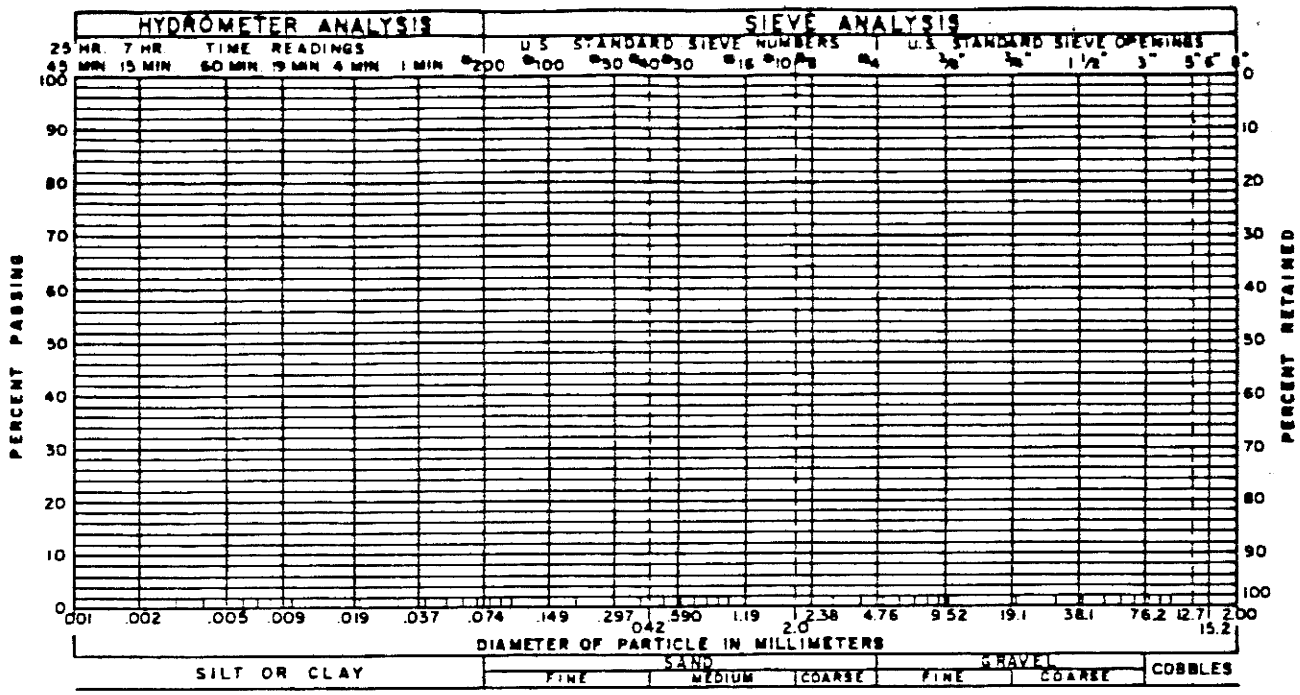
SAMPLE OF FROM

GRADATION TEST RESULTS

Job No. 161024

ATTACHMENT #4

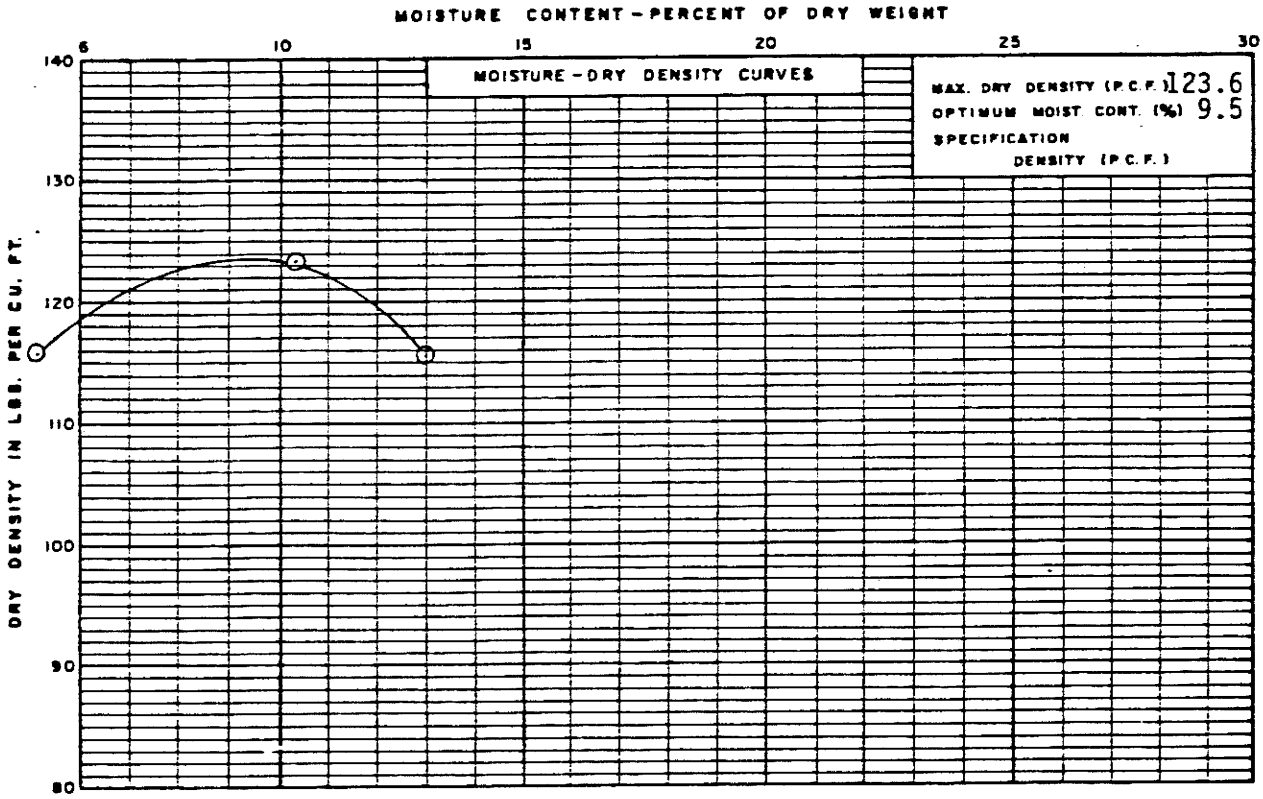
Figure B-2



GRADATION TEST RESULTS

GRAVEL % SAND % SILT AND CLAY %

LIQUID LIMIT % PLASTICITY INDEX %



COMPACTION TEST RESULTS

COMPACTION TEST PROCEDURE ASTM D 698, Method C

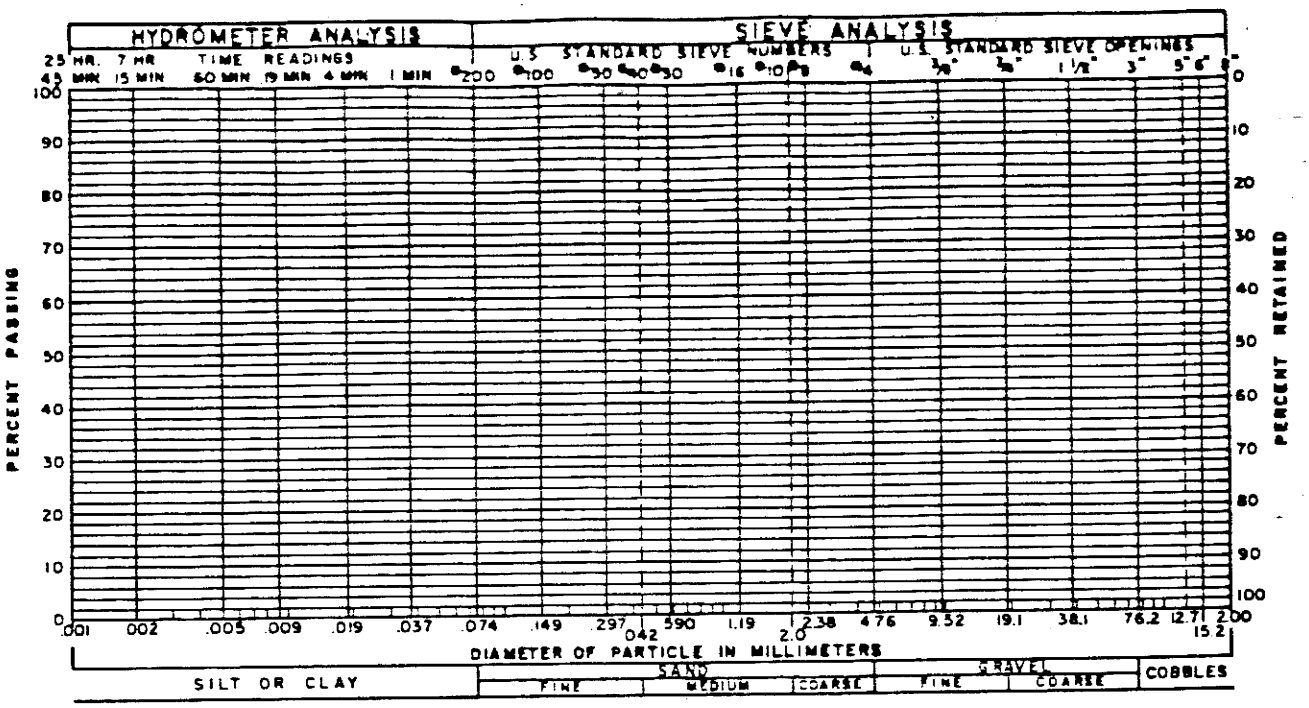
SAMPLE OF Gravelly sand

FROM Sediment Pond No. 1 DEPTH 2-8'

Job No. 161024

Figure B-3

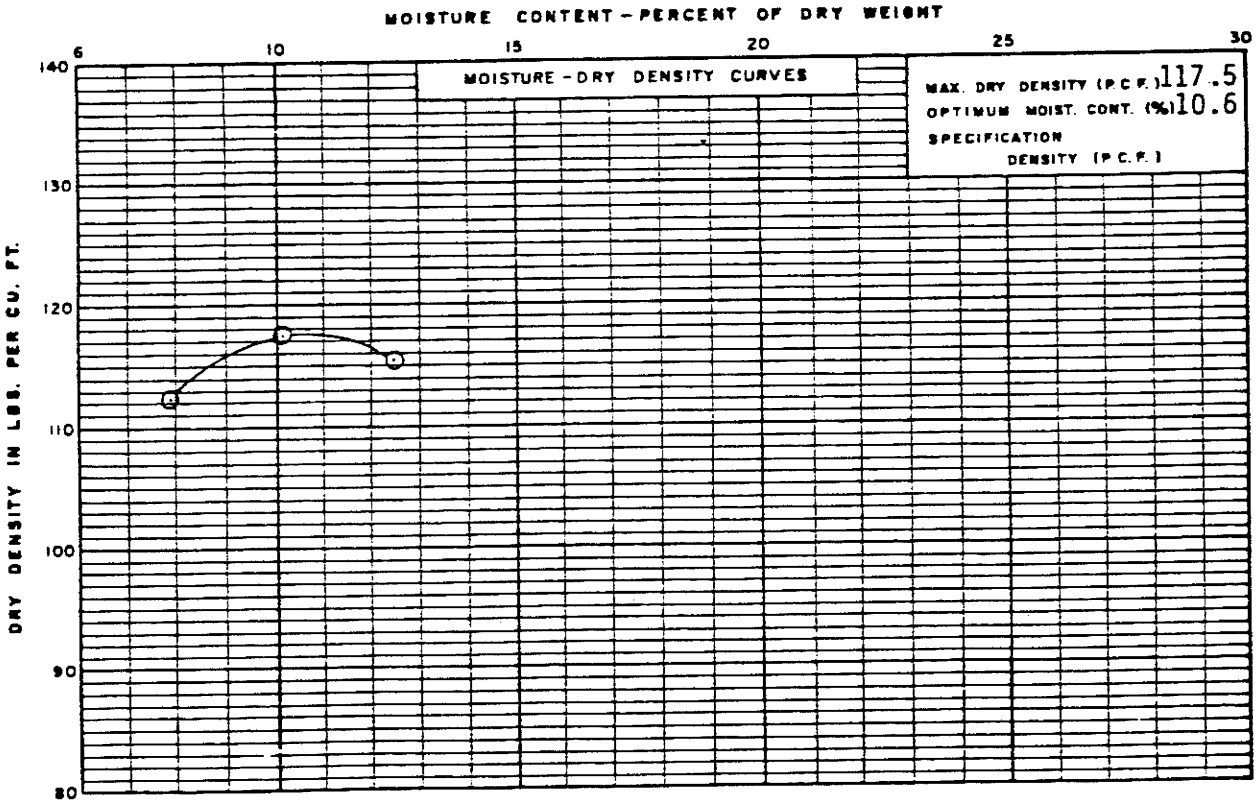
ATTACHMENT #4



GRADATION TEST RESULTS

GRAVEL % SAND % SILT AND CLAY %

LIQUID LIMIT % PLASTICITY INDEX %



COMPACTION TEST RESULTS

COMPACTION TEST PROCEDURE ASTM D 698, Method D

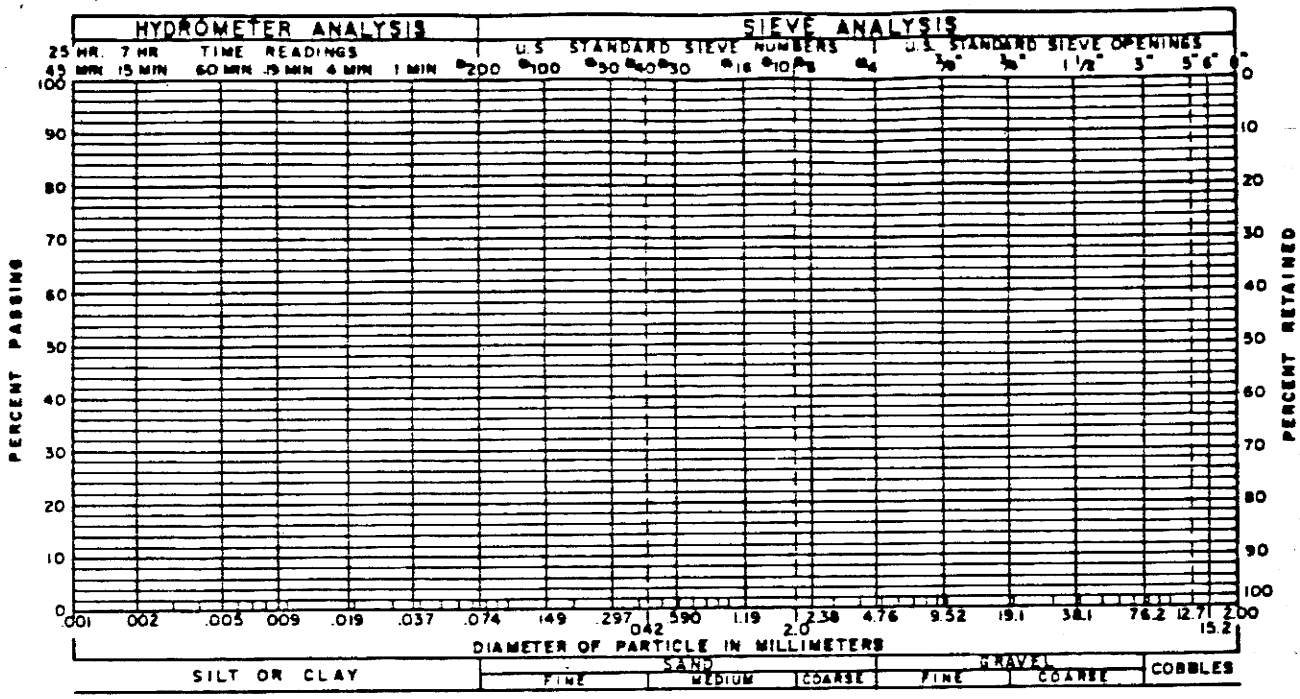
SAMPLE OF Gravelly, silty sand w/some coal

FROM Sediment Pond No. 1 DEPTH 12-18'

Job No. 161024

Figure B-4

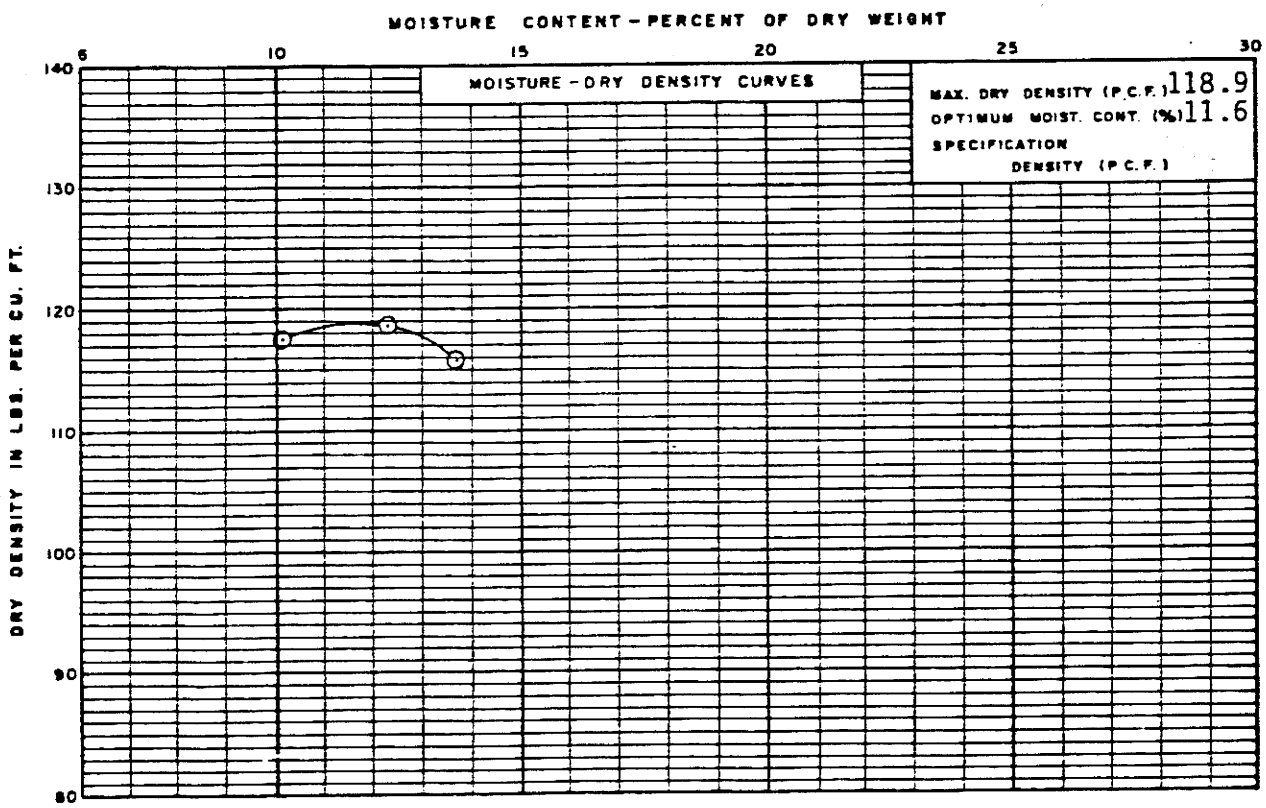
ATTACHMENT #4



GRADATION TEST RESULTS

GRAVEL % SAND % SILT AND CLAY %

LIQUID LIMIT % PLASTICITY INDEX %



COMPACTION TEST RESULTS

COMPACTION TEST PROCEDURE ASTM D 698, Method D

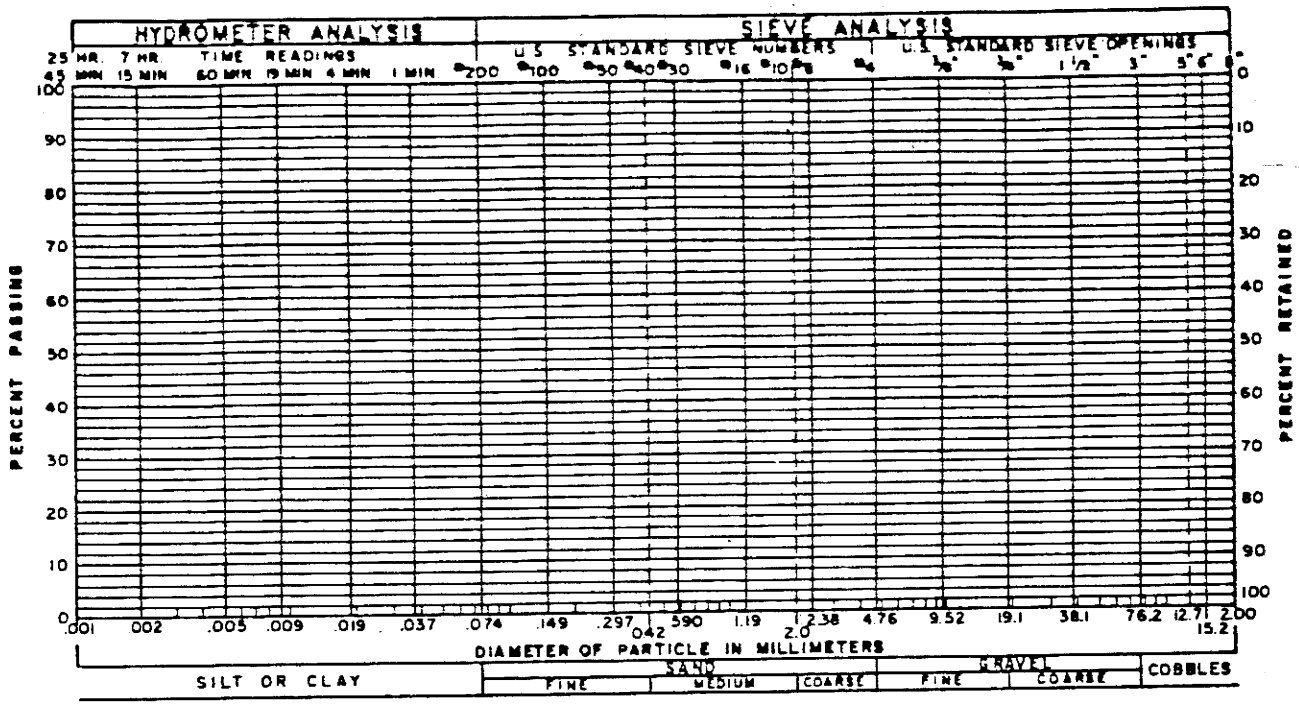
SAMPLE OF Gravelly, silty sand with some coal

FROM Sediment Pond No. 3 DEPTH 5-15'

Job No. 161024

ATTACHMENT #4

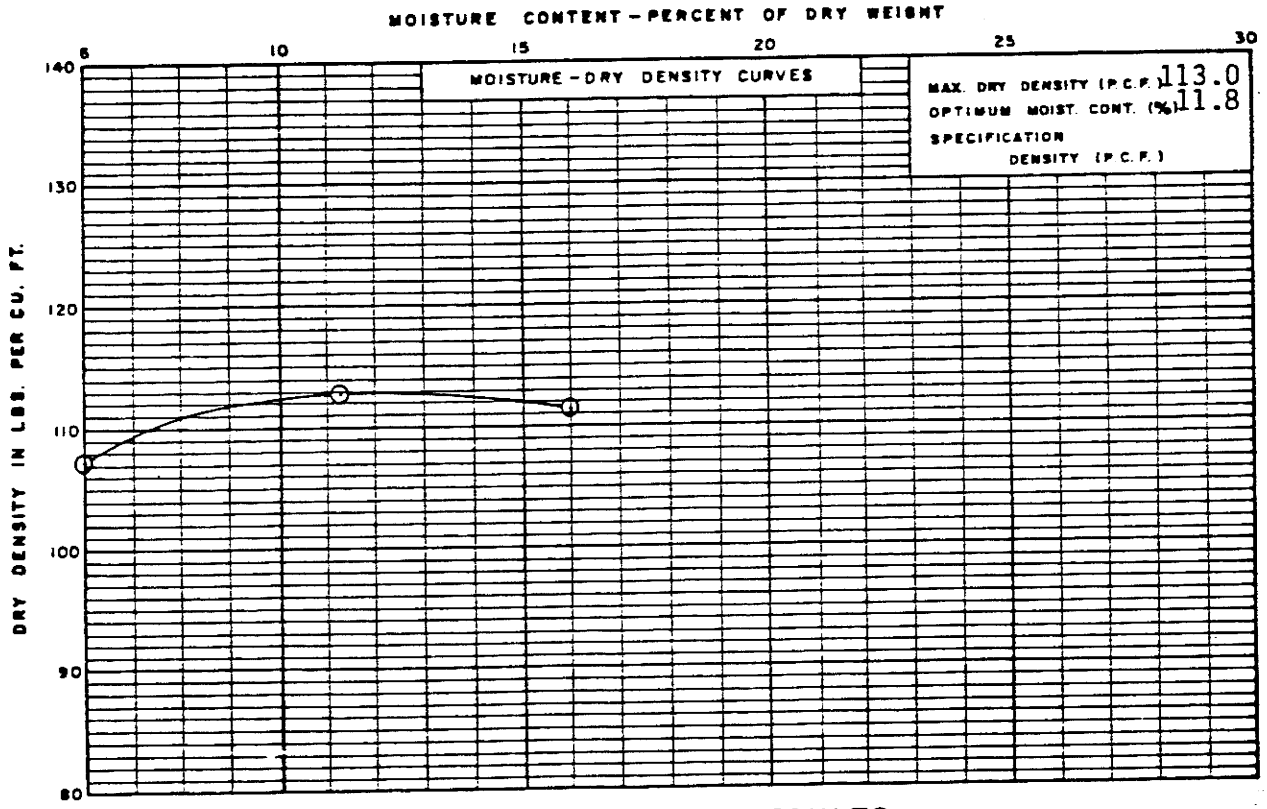
Figure B-5



GRADATION TEST RESULTS

GRAVEL % SAND % SILT AND CLAY %

LIQUID LIMIT % PLASTICITY INDEX %



COMPACTION TEST RESULTS

COMPACTION TEST PROCEDURE ASTM D 698, Method C

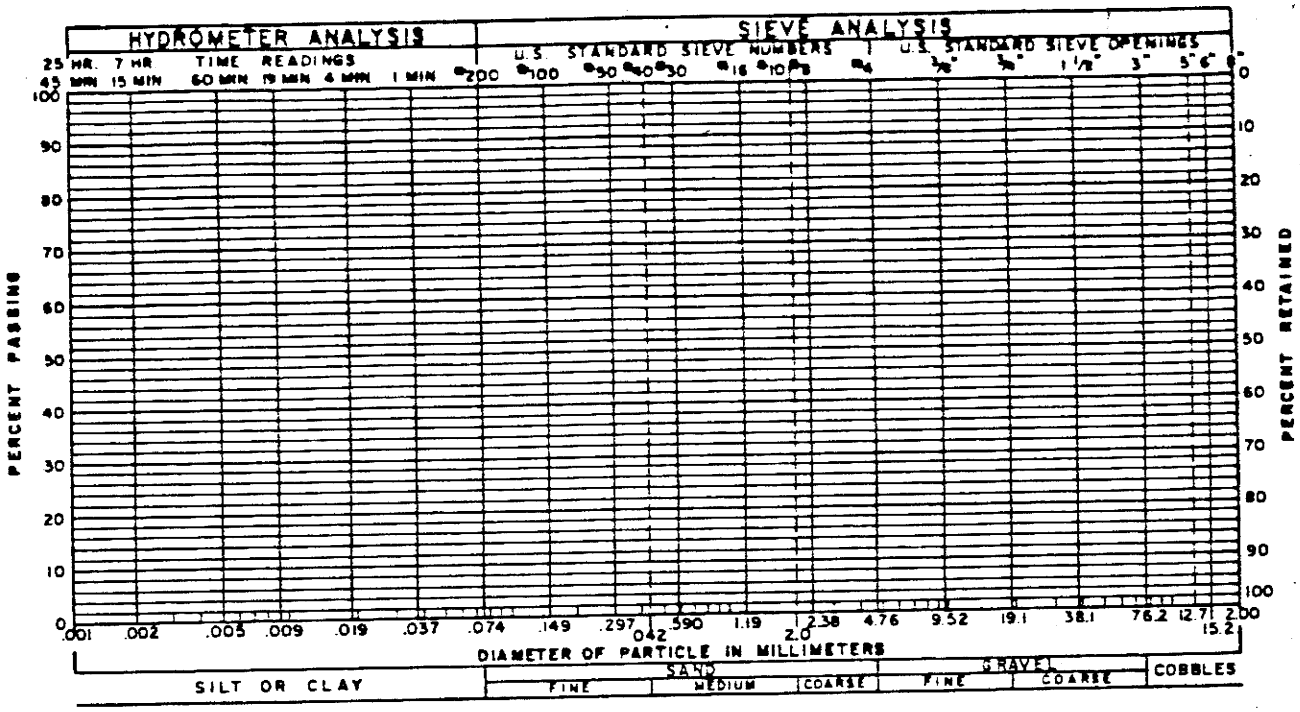
SAMPLE OF Gravelly clay with some coal

FROM Sediment Pond No. 3 DEPTH 32-40'

Job No. 161024

Figure B-6

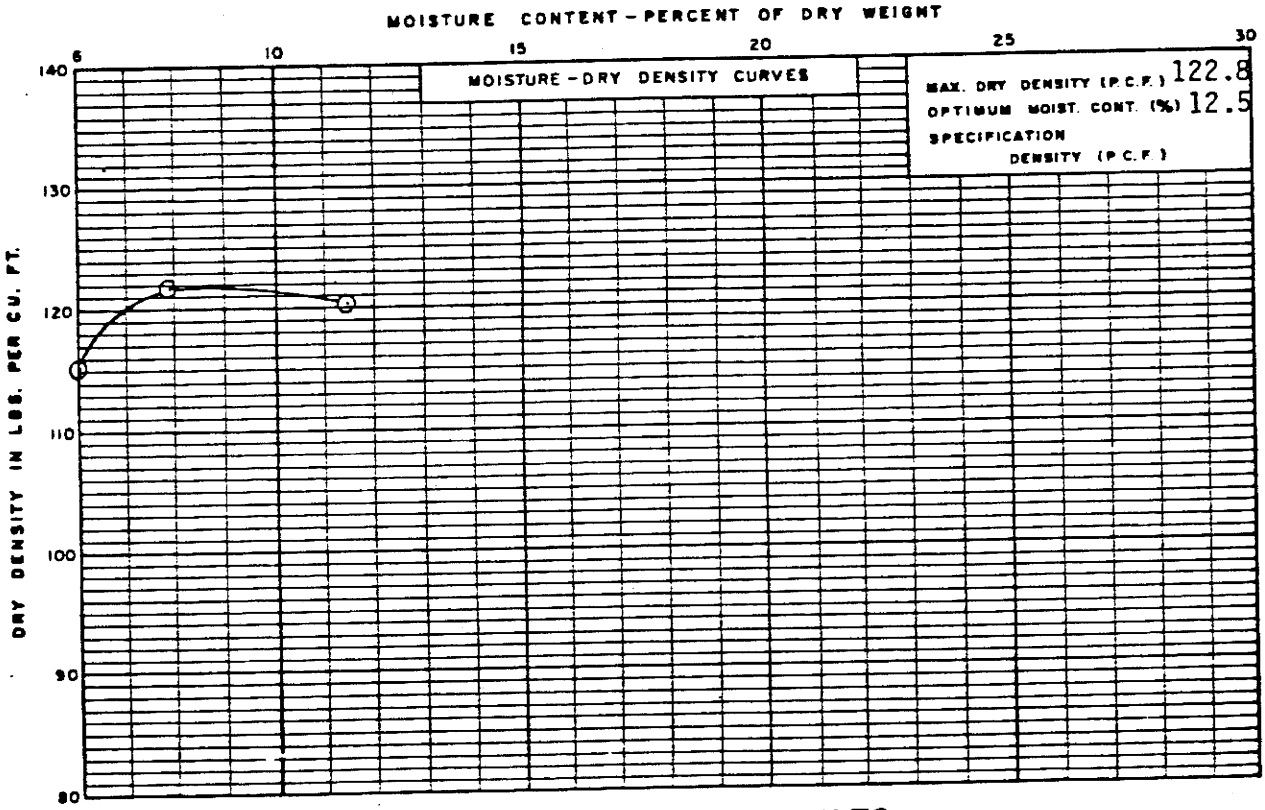
ATTACHMENT #4



GRADATION TEST RESULTS

GRAVEL % SAND % SILT AND CLAY %

LIQUID LIMIT % PLASTICITY INDEX %



COMPACTION TEST RESULTS

COMPACTION TEST PROCEDURE ASTM D 698, Method D

SAMPLE OF Gravelly, sandy clay

FROM Sediment Pond No. 5 DEPTH 2-8'

Job No. 161024

ATTACHMENT #4

Figure B-7

APPENDIX C - STABL2 COMPUTER PROGRAM OUTPUT

ATTACHMENT #4

--SLOPE STABILITY ANALYSIS--
SIMPLIFIED JANBU METHOD OF SLICES
IRREGULAR FAILURE SURFACES

PROBLEM DESCRIPTION PROJ NO 161024 PLATEAU MINE -- POND 1
CASE 1 -- FULL POOL

BOUNDARY COORDINATES

11 TOP BOUNDARIES
13 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (FT)	Y-LEFT (FT)	X-RIGHT (FT)	Y-RIGHT (FT)	SOIL TYPE BELOW BNE
1	.00	23.00	70.00	55.00	2
2	70.00	55.00	160.00	120.00	1
3	160.00	120.00	175.00	120.00	1
4	175.00	120.00	186.00	114.00	1
5	186.00	114.00	194.00	110.00	1
6	194.00	110.00	206.00	104.00	2
7	206.00	104.00	226.00	104.00	2
8	226.00	104.00	240.00	114.00	2
9	240.00	114.00	248.00	120.00	2
10	248.00	120.00	252.00	140.00	2
11	252.00	140.00	272.00	150.00	2
12	70.00	55.00	150.00	90.00	2
13	150.00	90.00	194.00	110.00	2

ATTACHMENT #4

ISOTROPIC SOIL PARAMETERS

2 TYPE(S) OF SOIL

SOIL TYPE NO.	TOTAL UNIT WT. (PCF)	SATURATED UNIT WT. (PCF)	COHESION INTERCEPT (PSF)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER	PRESSURE CONSTANT (PSF)	PIEZOMETRIC SURFACE NO.
1	110.0	125.0	.0	38.0	.00	.0	1
2	115.0	125.0	.0	40.0	.00	.0	1

ATTACHMENT #4

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 62.40

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 8 COORDINATE POINTS

POINT NO.	X-WATER (FT)	Y-WATER (FT)
1	.00	.00
2	60.00	20.00
3	130.00	50.00
4	150.00	90.00
5	186.00	114.00
6	240.00	114.00
7	250.00	109.00
8	272.00	120.00

ATTACHMENT #4

SEARCHING ROUTINE WILL BE LIMITED TO AN AREA DEFINED BY 5 BOUNDA
OF WHICH THE FIRST 5 BOUNDARIES WILL DEFLECT SURFACES UPWARD

BOUNDARY NO.	X-LEFT (FT)	Y-LEFT (FT)	X-RIGHT (FT)	Y-RIGHT (FT)
1	.00	.00	60.00	20.00
2	60.00	20.00	130.00	52.00
3	130.00	52.00	194.00	81.00
4	194.00	81.00	250.00	109.00
5	250.00	109.00	272.00	120.00

ATTACHMENT #4

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED.

100 TRIAL SURFACES HAVE BEEN GENERATED.

10 SURFACES INITIATE FROM EACH OF 10 POINTS EQUALLY SPACED ALONG THE GROUND SURFACE BETWEEN X = 60.00 FT.
AND X = 140.00 FT.

EACH SURFACE TERMINATES BETWEEN X = 100.00 FT.
AND X = 200.00 FT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION AT WHICH A SURFACE EXTENDS IS Y = .00 FT.

10.00 FT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

FOLLOWING ARE DISPLAYED THE 15% MOST CRITICAL OF THE TRIAL FAILURE SURFACES EXAMINED. THEY ARE ORDERED - MOST CRITICAL FIRST.

FAILURE SURFACE SPECIFIED BY 11 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	77.78	60.62
2	86.63	65.27
3	95.71	70.23
4	103.82	75.46
5	112.14	81.03
6	120.77	86.86
7	128.19	92.96
8	135.89	99.34
9	143.37	105.98
10	150.61	112.88
11	151.75	114.04

*** 1.090 ***

FAILURE SURFACE SPECIFIED BY 12 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	77.78	60.62
2	87.25	63.22
3	96.52	67.57
4	105.56	71.96
5	114.32	76.67
6	122.79	81.99
7	130.93	87.79
8	138.72	94.06
9	146.13	100.76
10	153.13	107.92
11	159.70	115.46
12	163.28	120.00

*** 1.128 ***

ATTACHMENT #4

FAILURE SURFACE SPECIFIED BY 10 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	95.56	73.46
2	104.44	75.74
3	113.19	82.62
4	121.80	87.97
5	130.27	93.30
6	138.57	99.37
7	146.71	104.67
8	154.69	110.70
9	162.49	116.96
10	166.06	120.00

*** 1.149 ***

FAILURE SURFACE SPECIFIED BY 10 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	95.56	73.46
2	105.20	76.11
3	114.57	79.59
4	123.60	83.89
5	132.22	88.96
6	140.36	94.76
7	147.97	101.26
8	154.97	108.40
9	161.32	116.13
10	163.97	120.00

*** 1.156 ***

ATTACHMENT #4

FAILURE SURFACE SPECIFIED BY 8 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	113.33	86.30
2	122.28	90.77
3	131.35	95.57
4	139.64	100.69
5	148.03	106.13
6	156.21	111.83
7	164.18	117.93
8	166.70	120.20

*** 1.199 ***

FAILURE SURFACE SPECIFIED BY 8 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	113.33	86.30
2	123.25	87.61
3	132.76	90.70
4	141.55	95.47
5	149.33	101.75
6	155.94	109.34
7	160.87	117.98
8	161.59	120.00

*** 1.210 ***

ATTACHMENT #4

FAILURE SURFACE SPECIFIED BY 8 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	122.22	92.72
2	132.12	94.18
3	141.39	97.91
4	149.54	103.76
5	156.11	111.24
6	160.68	120.00

*** 1.213 ***

FAILURE SURFACE SPECIFIED BY 4 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	140.00	105.56
2	149.55	108.51
3	156.57	115.64
4	157.27	118.03

*** 1.219 ***

ATTACHMENT #4

FAILURE SURFACE SPECIFIED BY 10 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	95.56	73.46
2	105.53	74.19
3	115.36	76.47
4	124.52	80.25
5	133.76	85.43
6	140.71	91.39
7	147.23	99.46
8	152.52	107.96
9	156.39	117.18
10	156.46	117.44

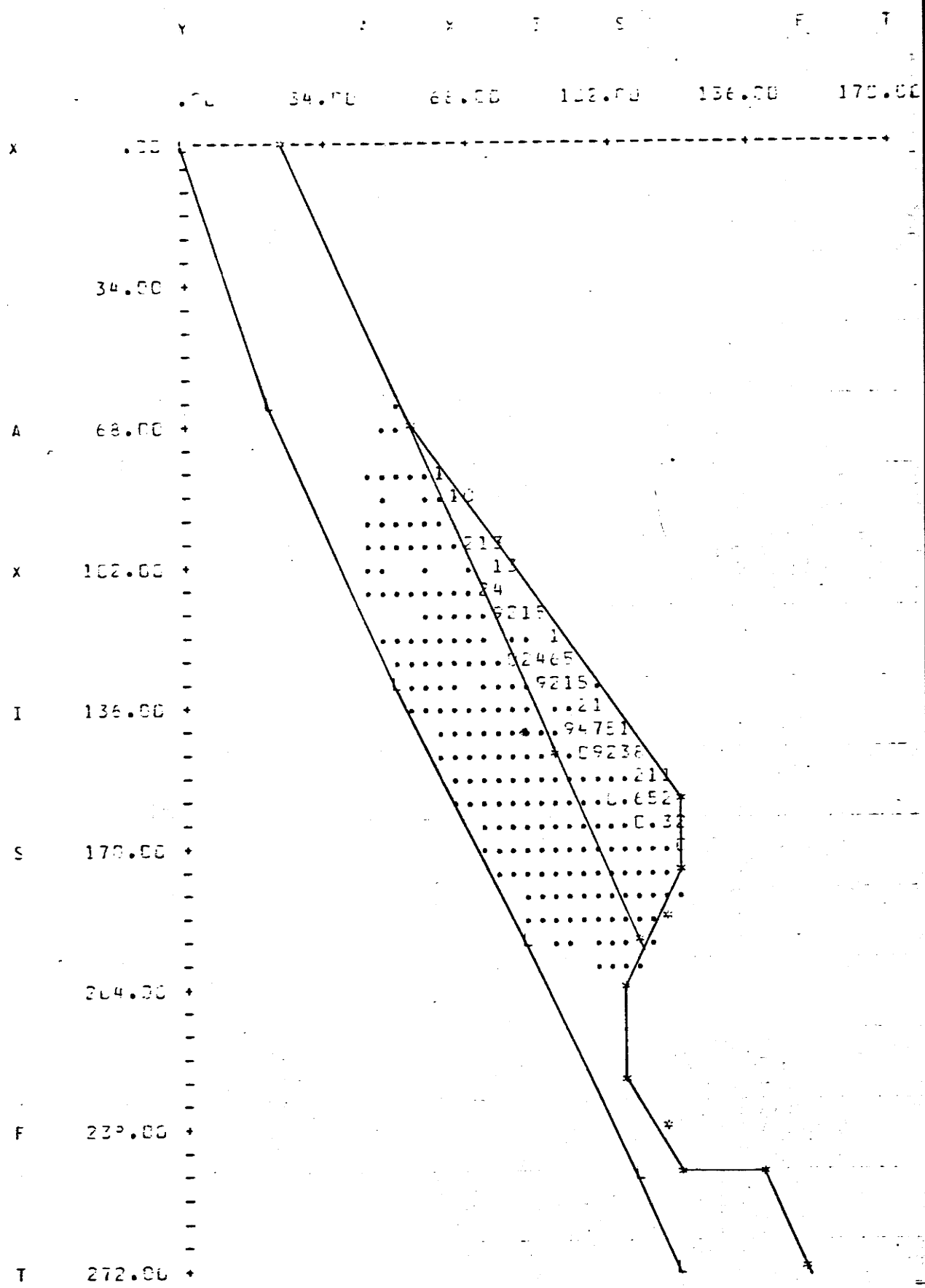
*** 1.224 ***

FAILURE SURFACE SPECIFIED BY 12 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	86.67	67.04
2	96.43	69.18
3	106.02	72.04
4	115.37	75.59
5	124.43	79.81
6	133.16	84.69
7	141.51	90.19
8	149.44	96.29
9	156.89	102.95
10	163.84	110.14
11	170.25	117.82
12	171.81	120.00

*** 1.240 ***

ATTACHMENT #4



ATTACHMENT #4

A HORIZONTAL EARTHQUAKE LOADING COEFFICIENT
OF .100 HAS BEEN ASSIGNED

A VERTICAL EARTHQUAKE LOADING COEFFICIENT
OF .100 HAS BEEN ASSIGNED.

CAVITATION PRESSURE = .0 PSF

A OPTIMAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED.

100 TRIAL SURFACES HAVE BEEN GENERATED.

10 SURFACES INITIATE FROM EACH OF 10 POINTS EQUALLY SPACED ALONG THE GROUND SURFACE BETWEEN X = 60.00 FT.
AND X = 140.00 FT.

EACH SURFACE TERMINATES BETWEEN X = 150.00 FT.
AND X = 200.00 FT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION AT WHICH A SURFACE EXTENDS IS Y = .00 FT.

10.00 FT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

ATTACHMENT #4

FOLLOWING ARE DISPLAYED THE TEN MOST CRITICAL OF THE TOTAL FAILURE SURFACES EXAMINED. THEY ARE ORDERED - MOST CRITICAL FIRST.

FAILURE SURFACE SPECIFIED BY 12 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	77.78	57.62
2	86.78	64.96
3	95.60	69.68
4	104.24	74.71
5	112.69	80.07
6	120.92	85.74
7	128.94	91.73
8	136.72	98.01
9	144.25	104.58
10	151.53	111.44
11	158.55	118.57
12	159.58	119.69

*** .693 ***

FAILURE SURFACE SPECIFIED BY 6 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	122.22	92.72
2	131.20	97.13
3	139.62	102.51
4	147.41	108.79
5	154.45	115.90
6	154.62	116.11

*** .897 ***

ATTACHMENT #4

FAILURE SURFACE SPECIFIED BY 6 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	122.22	93.72
2	131.36	95.37
3	140.67	100.11
4	149.20	106.69
5	154.07	114.79
6	154.65	116.13

*** .951 ***

FAILURE SURFACE SPECIFIED BY 4 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	140.00	105.56
2	149.35	109.10
3	157.43	114.99
4	161.44	120.00

*** .955 ***

ATTACHMENT #4

FAILURE SURFACE SPECIFIED BY 14 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	60.00	50.43
2	69.68	52.94
3	79.19	56.02
4	88.52	59.64
5	97.61	63.80
6	106.45	68.48
7	115.00	73.66
8	123.23	79.34
9	131.12	85.48
10	138.64	92.08
11	145.76	99.09
12	152.47	106.50
13	158.73	114.31
14	162.77	120.00

*** .968 ***

FAILURE SURFACE SPECIFIED BY 13 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	77.78	60.62
2	86.49	65.52
3	95.16	70.51
4	103.76	75.58
5	112.35	80.73
6	120.87	85.96
7	129.35	91.27
8	137.77	96.67
9	146.14	102.14
10	154.45	107.69
11	162.71	113.33
12	170.92	119.04
13	172.88	120.00

*** .986 ***

ATTACHMENT #4

FAILURE SURFACE SPECIFIED BY 13 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	68.89	54.49
2	78.73	56.29
3	88.39	59.57
4	97.81	62.23
5	106.92	66.34
6	115.67	71.16
7	124.00	76.71
8	131.86	82.90
9	139.19	89.71
10	145.94	97.08
11	152.07	104.98
12	157.54	113.35
13	161.15	120.00

*** 1.002 ***

FAILURE SURFACE SPECIFIED BY 13 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	77.78	60.62
2	86.33	64.86
3	95.81	69.27
4	104.70	73.84
5	113.50	73.59
6	122.22	83.49
7	130.94	88.56
8	139.36	93.79
9	147.78	99.18
10	156.11	104.73
11	164.32	110.43
12	172.43	116.28
13	176.38	119.25

*** 1.027 ***

ATTACHMENT #4

FAILURE SURFACE SPECIFIED BY 8 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	117.33	86.30
2	122.05	91.20
3	127.73	96.16
4	139.35	101.17
5	146.91	106.24
6	156.60	111.36
7	165.15	116.54
8	172.79	120.00

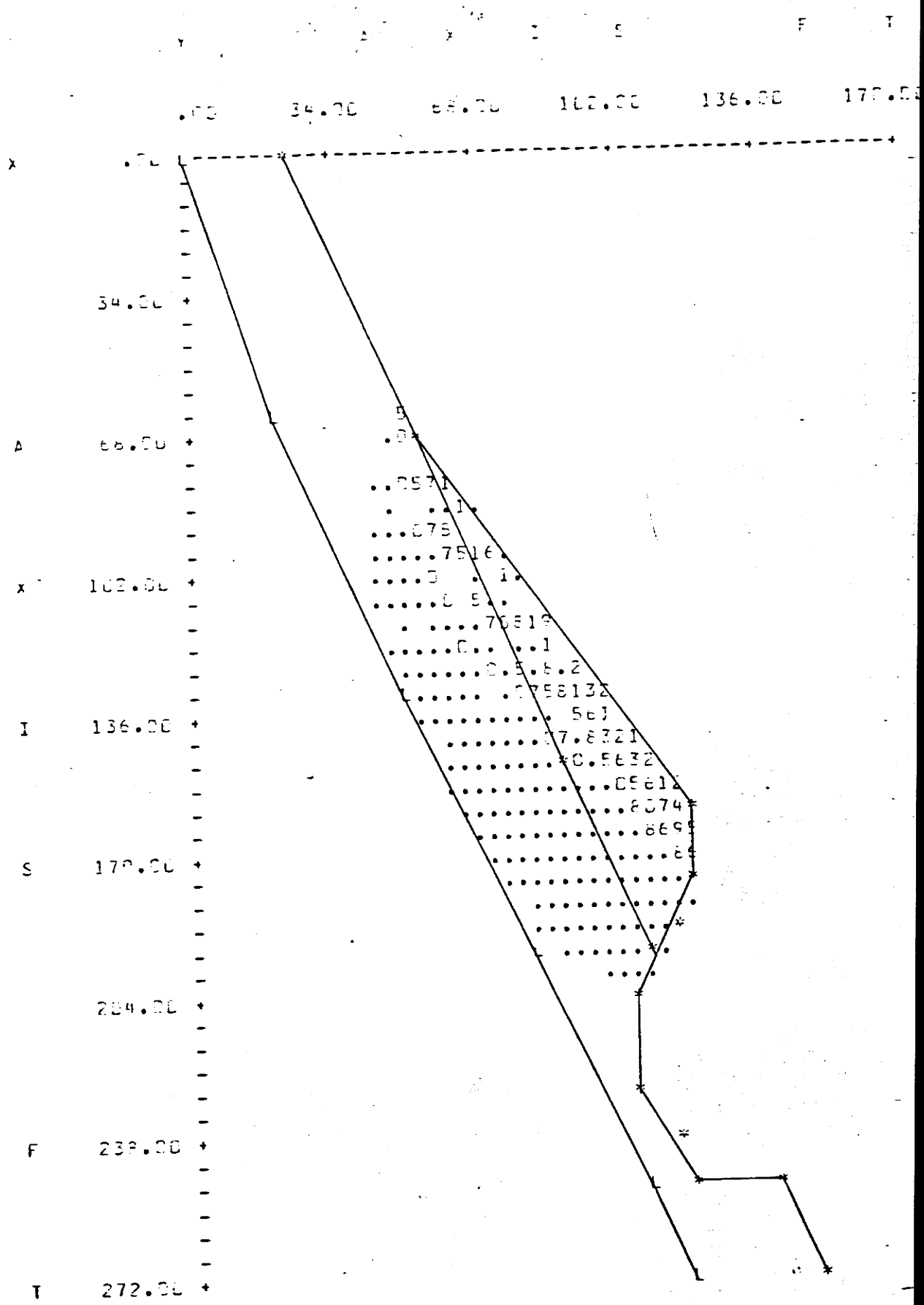
*** 1.063 ***

FAILURE SURFACE SPECIFIED BY 15 COORDINATE POINTS

POINT NO.	X-SURF (FT)	Y-SURF (FT)
1	60.00	50.43
2	70.00	50.71
3	79.92	51.94
4	89.66	54.12
5	99.19	57.21
6	108.36	61.21
7	117.10	66.06
8	125.35	71.72
9	133.01	76.14
10	140.02	85.27
11	146.33	93.03
12	151.86	101.36
13	156.57	110.19
14	160.41	119.42
15	162.59	120.00

*** 1.071 ***

ATTACHMENT #4



ATTACHMENT #4

ATTACHMENT #5

FIRE PREVENTION PLAN - REFUSE PILES

Fire prevention in the refuse pile is accomplished by adequate compaction of each lift with spreading and haulage equipment and by removing and spreading, before ignition occurs, any hot material observed.

Wetting of roadways on the refuse pile during dry seasons is used to insure compaction of dry fines. Inclusions of extraneous combustible materials are prohibited.

FIRE CONTROL PLAN - REFUSE PILES

Although PMC has never experienced a fire in its Refuse Pile, the following measures will be taken in the unlikely event a fire should ever occur:

1] In small, isolated areas, the burning material will be removed, spread, and extinguished.

2] In larger areas, a soil seal 24 inches in thickness will be applied and compacted.

3] Water infusion may be required for deep burning areas or continued burning of sealed areas.