PAIUTE

MWP

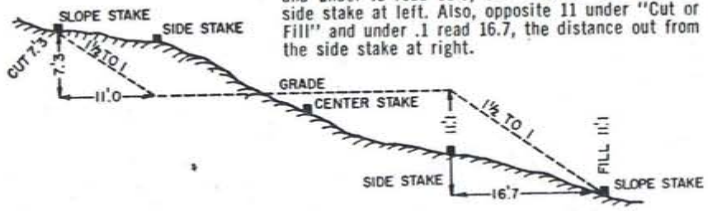
TRANSIT BOOK

Mark Payne

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

Roadway of any Width. Side Slopes 1½ to 1.

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.



Cut or Fill	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	Cut or Fill
	Distance out from Side or Shoulder Stake										
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

For Curve Tables see end of book.

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COMPUTER DESIGNATIONS FOR PAIUTE SAMPLES

Field 3

1 Rock Chip
2 Soil
3 Vegetation
4 Drilling
5 Stream Sediments
6 Fluid Inclusion

Field 4

1 Dump or adit
2 Pyritic
3 Non-pyritic
4 -20 Mesh
5 Heavy Mineral Concentrate
6 Duplicates
7 Orientation
8 Recon
9 Standard
10 Rerun

Field 5

1 Purple
2 Bleached
3 Gray
4 Red
5 White
6 Green

Field 6

1 Silicic
2 Argillic
3 Propylitic
4 Silicic & argillic

Field 7

1 welded
2 lapilli
3 lithic
4 Qtz
5 Qtz + pyrite
6 calcite veined
7 goethite-stained
8 welded / lithic
9 VUGGLE Silica
10 Barite
11 wkly qtz veined (1-10%)
12 mod. qtz veined (10-25%)
13 strongly qtz veined (25% +)
14 Jarosite-stained

Field 8

1 Lower Hartford Hill Fm
2 Middle Hartford Hill Fm
3 Upper Hartford Hill Fm
4 Pyramid Fm
5 Stockwork I Stringers - Breccia

Friday, June 22nd, 1984
Detailed geologic mapping of the East gold anom. on the Paiute Fault.

The area of interest for this season is the east end of the Paiute Fault Zone where Dennis took 2 lb rock chip recon-type samples that returned some ore-grade assays.

Sample 83033PR = 0.093 oz/ton gold
83081 PR = 0.184 oz/ton gold
83084 PR = 0.077 oz/ton gold

These samples more-or-less where high-grading Qtz stockworks.

The area of samples 33, 81, & 84 has been delineated and detailed mapping and sampling are now in progress. I will begin mapping at the east boundary of this area.

Robert is taking sample 84001PR at the NE corner of the area. I will also begin my work at this point.

At sample 84001PR the rock is all green with orange-brown limonite and dk brown goethite on the fractures. Green propylitically (?) altered wkly silicified lithic (?) tuff with only faint texture and moderately quartz veined. The veins are hair-line to ¼" in width, are chalcedonic looking qtz and only occasionally show any banding. The Qtz veinlets contain Qtz xtl filled open vugs. No sulfides visible. The veins contain bands of dk bluish-green that look like celadonite mixed with silica. This stuff has more of a cherty appearance to it than the remainder of the vein material.

This above described rock appears to be fairly representative of the mineralization on the northern side of the stockwork zone except that there is no visible pyrite here.

10 ft away from that first description the rock shows some argillization of feldspar phenocrysts and argillization beginning in the groundmass. I would now consider the Qtz veining to be strong here and most of the veins are small gash-fracture like fillings only millimeters long in extent. These little veinlets appear to be unrelated to the larger sugary white to clear qtz veins with the crystal-filled open vugs.

On the upper end of this large outcrop I have been describing, the silicification increases and is locally strong. In some instances. This appears as silica flooding of the rock grading into Qtz vein material.

Adjacent to 84005 PR the Qtz veining is strong and the veins are large, up to ½" wide, (the) have open vugs filled with euhedral Qtz xtls and faint cloudy-white patches with indistinct borders appears to be adularia interlayed with this ?

33, 81, 84

Friday, June 22nd, 1984 (Cont'd)

The appearance of adularia in Qtz veins (Potassic Alteration) is a classic characteristic of precious metal bearing epithermal qtz veins as opposed to non-productive Qtz veins.

Have also noticed that in the large banded Qtz veins that have the bands of dk bluish-green celadonite + Qtz (?) material, is also commonly accompanied by strong bands of bright brick-red hematitic cherty or jaspery material.

I have now traversed to the south side of the Paiute Fault zone. The mineralized rock is very consistent in its appearance. The propylitic alteration, the degree of stockwork veining, degree of FeOx staining on fractures, etc, is fairly constant. There is an abrupt contact into a lt. olive-green, wkly propylitized lithic tuff, that contains no Qtz veining or recognizable mineralization.

The traverse across the mineralized zone described above will be sampled continuously by 5 ft channel samples at 10 pounds each, along a N15°W trend. All samples are marked with a lath and labeled metal tag, and the start and end of the sample are spray painted orange lines. All channel rock chip samples are horizontal and may have offsets in them to maintain the continuity of the sample. In the future I will refer to this continuous line of samples as ~~the~~ traverse no. 1.

Traverse no. 1 — the mineralized zone measured ⊥ to strike is approximately 280 feet wide.

From Traverse No. 1, I walked east and down slope to the creek in the bottom of Secret Canyon, and looked for outcrops of the mineralization. Didn't see any. Mostly alluvium and slope wash, float etc, except for small outcrop of silicified lithic tuff and two outcrops to the north, of unaltered biotite & feldspar porphyritic rhyolite. These two unaltered outcrops occur just downhill from the prospect with the white dump pile that is on the east slope of Secret Canyon. I'm now heading up to that prospect.

The dump marks the site of an old caved adit. The material on the dump is typical of the green propylitically altered tuff with stockwork Qtz veining throughout, and minor pyrite. Some of the tuff exhibits silica flooding. Sample 83061PR was taken here.

Monday, June 25th, 1984
Detailed geologic mapping of the East Gold Anomaly, East side of Secret Canyon.

Picking-up where I left off on Friday. Found the east strike extension of mineralization along the Paiute Fault Zone. The contact between the mineralization and the wall rocks is not exposed. The outcrops are separated by 40 to 50 feet of cover. The mineralization seems a bit weaker here, there is a decrease in Qtz veining and no pyrite is visible ~~at~~ but there is weak jarosite staining. The green propylitic alteration is weak to non-existent. There is some large flakes of white mica euhedral in shape but I think it is just bleached and somewhat argillized biotite and is not phyllic alteration.

There is another small white dump that marks a caved prospect adit about 50 feet north of the aforementioned dump. The rock in this working is lt. green, propylitically altered, moderately silicified tuff with weak limonite and jarosite on fractures and minor amounts of coarse euhedral pyrite assoc. with the Qtz stockwork veining. Veining is strong here.

This slope is very steep and is mostly covered with slope wash except for some of the more resistant outcrops. Based on definite outcrops the mineralized zone appears to be about 160 feet wide of Qtz vein stockwork rock and an additional 40 feet can be added to the north of rock carrying disseminated pyrite but no Qtz stockwork veining.

I will begin geologic mapping at 1" = 200 foot scale tomorrow. Don't have the aerophoto with me today. Will do some rock chip channel sampling today. Give Bill and Robert a hand. Up at Traverse no. 1.

** 84009PRØ · 06041205
5 ft channel sample on traverse no. 1. From north to south, 4 ft of green propylitically altered argillized lithic tuff with wk to strong quartz veining averaging moderate. The strength of the veining increases to the south. 1 foot is strongly silica flooded and Qtz veined rock.

** 84011PRØ · 06011205
5 ft channel rock chip sample on Traverse no. 1. Same as 84009, mod silicif, green propylitic altered, mod. qtz veined lithic tuff.

** 84015PRØ. Bill ~~took~~ finished taking this sample.

Thursday, June 28th, 1984
Detailed geologic mapping of the East End of the Paiute Fault Zone, west of Secret Canyon.

Walked from the south end of traverse No. 1 about 500 feet south through fresh volcanics to another mineralized zone similar to that sampled in traverse no. 1. This other zone is approx. 50 ft wide. On the north side of this zone the volcanics are weakly silica flooded and carry up to 1% dissem. pyrite. This grades into same with weak qtz stockwork veining and an increase up to 2% pyrite that is oxidized to limonite. No green propylitic alteration here, the rock is tan in color.

Marked-out a second rock chip channel sample traverse ⊥ across the Paiute Fault Zone

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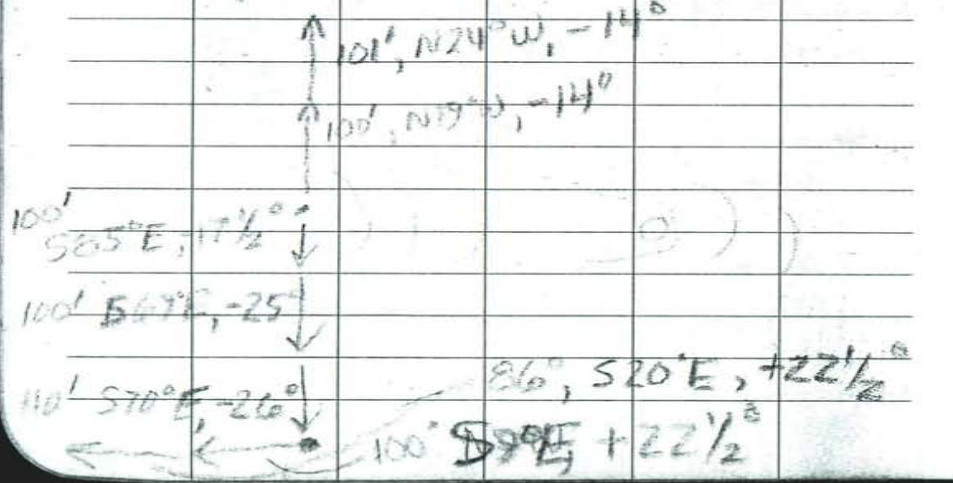
Tuesday, July 3rd, 1984
Rock chip sampling along the Paiute Fault Zone in the area of detailed channel sampling.

★ 84054PRØ-03011305
Strongly quartz-veined gray wkly silicified tuff with relict volcanic texture and lithic fragments. No propylitization here, only minor coarse disseminated pyrite. Some strong wggy silica flooding adjacent to some of the larger Qtz veins.

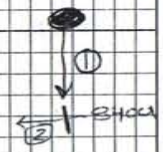
★ 84056PRØ - 03021305
Gray wkly argillized lithic tuff laced with strong qtz stockwork veining, no propylitic alteration, only trace coarse disseminated pyrite. Some of the veins up to ½" wide, randomly oriented.

7-12-84
Survey drill holes.



7-18-84

From the easternmost drill hole surveying in Traverse no. 1



① 106°, -13°, 161 ft. from drill hole to 84001PR.
② 192°, +31½°, 40 ft
③ sample 84015PR 225°, +43°, 40 ft.
④ sample 84025PR 168°, +5°, 50 ft
⑤ sample 84033PR 193°, +8½°, 50 ft.

Thursday, July 19th, 1984

Got assay results back from Hunter Labs.

Sample 84015PR ran 0.33 oz/t gold and 0.24 oz/t silver

Sample 84026PR ran 0.055 oz/t gold

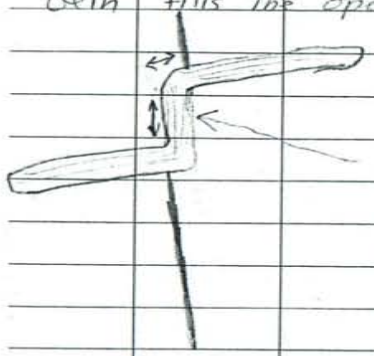
Sample 84030PR ran 0.014 oz/t gold

Sample 84032PR ran 0.030 oz/t gold

The remainder of the samples in traverse no. 1 (84001 → 84033) were either N.D.'s or double-ots.

Looking at sample 84015PR.

There are several orientations of the Qtz veins which make-up the stockework. There is a group of larger, banded, granular Qtz veins with moderate limonite and goethite associated. These veins are vuggy with FeOx and euhedral Qtz crystals growing in vugs. They trend due north 0° and another set trend N30°E and are just white quartz stringers. ~~[illegible]~~ At one place, the smaller N30°E vein is cut-off and a later due north vein fills the open space. See diagram below.



Sample #15 is 3' horizontal and crosses thru this area which could possibly account for the 0.33 oz/t gold? The samples on either side of #15 look the same otherwise.

The wall rocks show no actual silica flooding, only

Thursday, July 19th, 1984 (Cont'd)

development of Qtz stockework veining.

It is also interesting to note that silica flooding of wall rocks in samples collected on traverse no. 1 showed no preferential concentration of gold. This deep in the hydrothermal system one would think this would have to be an important consideration though. The silicification would likely outline the pipes accessible to hydrothermal solutions.

EXPLORATION

Though the gold values are spotty at the surface there have to be ways to outline ore shoots at depth deeper in the system if they do indeed occur.

a) drill areas of clustered gold anomalies; obvious choice

b) Au:Ag ratios might pinpoint hot spots along the Paiute Fault? Expect the higher Au:Ag ratios in the hot spots

c) Analyze all rock chip samples for Fluorine, a good hydrothermal tracer that is stable in the weathering environment.

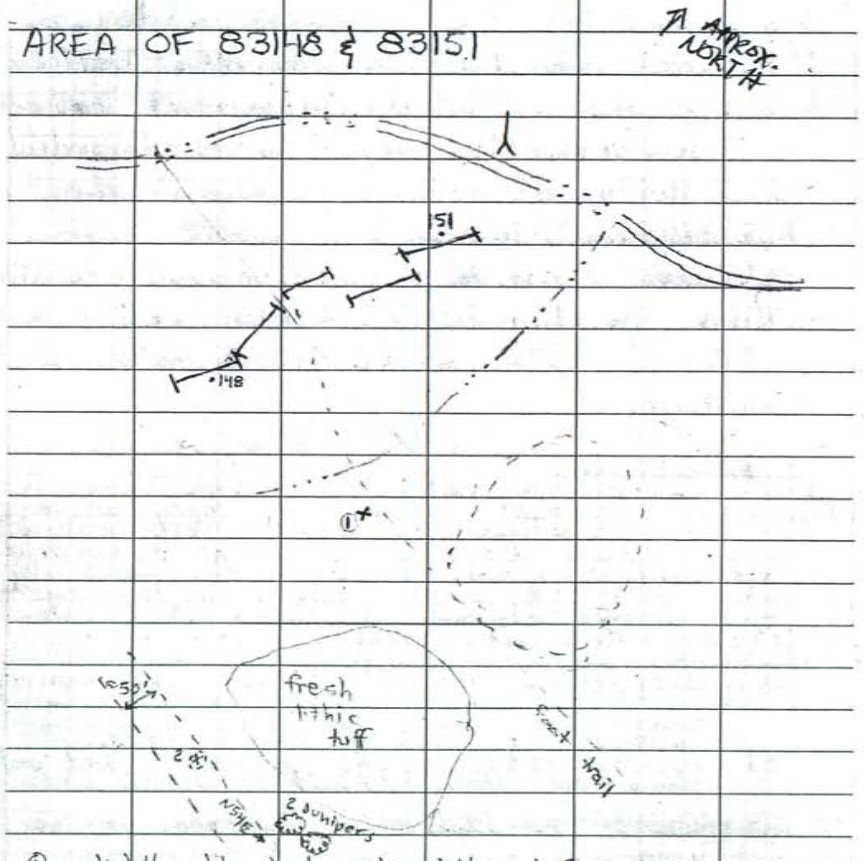
d) K/Rb ratios to hail-down hydrothermal hot spots in epithermal vein systems that typically have adularia associated with the best mineralization

e) additional structural complexities along the Paiute Fault Zone, ie. X-faulting, etc.

f) Oxygen isotopes could also pin down a hydrothermal hot spot.

Thursday, July 19th, 1984 (Cont'd)

AREA OF 83148 & 83151



① slightly bleached silic lithic tuff w/ Qtz pieces. this outcrop is on the foot trail where it crosses the steep gully. Wk Qtz veining with assoc. limonite. Qtz veins predominantly trending N74°E, dip 58° SE. These are actually veinlets not veins. Original texture in the rock is not obscurred. In fresh outcrops nearby, one of the predominant joint directions parallels the trend of the Qtz veinlets.

② Small outcrop of wkly alt'd (argillized & bleached) lithic tuff full of Qtz stockwork veining; strong, vuggy with limonite associated.

Tuesday, July 24th, 1984

84175PRØ - 03021101
6 ft horizontal channel rock chip sample. Wkly argillized lithic tuff, lt gray in color. The first section on the NW end of the sample is laced with weak quartz veining, granular white Qtz. Otherwise no Qtz veining in remainder of sample.

84176PRØ - 03011205
6 ft horizontal channel rock chip sample. Strongly silicified lithic tuff with gray color. Vuggy - porous; intergrown barite in places where the silicification is massive. Moderate Qtz veining.

84181PRØ - 03041101
6 ft horizontal channel rock chip. Both wkly argillized and wkly to strongly silicified, grey and locally green wkly propylitically altered. Weak Qtz veining. Lithic crystal tuff.

Wednesday, July 25th, 1984

84184PRØ - 06041101
5 ft horiz. channel rock chip sample. Pale green & gray wkly to mod. propylitically altered, both wkly argillized & silicified lithic crystal tuff. Wk qtz veining, mostly hairline type, but one was ½" wide with vuggy white Qtz, limonite, & heavy amounts of bluish-green celadonite?

84185PRØ - 02020301
tan-gray, bleached, wkly argillized, wkly propylitized to pale green lithic XT tuff w/ bleached mica flakes. No Qtz veins here.

Wednesday, July 25th, 1984 (Cont'd)

84186PRØ-03021101
5ft channel rock chip sample.
Lt gray wkly argillized lithic XtI tuff with very minor hairline Qtz veining and trace amounts of green propylitic alteration on fractures. Rock has a wkly bleached appearance.

84192PRØ-03021101
5 ft channel rock chip, horiz.
Lt gray with green propylitic minerals locally. Wk Qtz stockwork veining only hairline-sized, randomly interlocking. Disseminated pyrite locally, oxidized to limonite dots. Same lithic tuff unit wkly argillized.

Thursday, July 26th, 1984

Meet with Dave Todd of Coates Drilling at the Property this morning. Spent most of the morning with him.

84195PRØ-06041205
5ft diagonal channel rock chip
Green propylitized lithic XtI tuff, wkly argillized except local clumps of strong silicification. with no

Thursday, July 26th, 1984 (Cont'd)

preferred orientation. Moderate small to hairline Qtz stockwork veinlets, some of the larger ones vuggy and banded. Up to 2% dissem pyrite oxidized to orange limonite dots occur on the uphill 1 foot length of the channel, associated with strong silicification.

84196PRØ-06041205
same as 195 with moderate Qtz stockwork veinlets.

84201PRØ-03021101
Lt gray, wkly to moderately argill and bleached lithic XtI tuff. with wk Qtz stockwork veining very small and short in length. No propylitic no pyrite.

FRIDAY, JULY 27th, 1984
84202PRØ-03011101
Lt gray, wkly qtz stockwork veining, wk to mod silicified lithic XtI tuff. Minor limonite on fractures. No pyrite, No propylitic alteration.

84206PRØ-03011205
Gray granular massive silica with moderate Qtz stockwork veins. Veins & silica are vuggy. minor pyrite, wk green propylitic alt'n locally

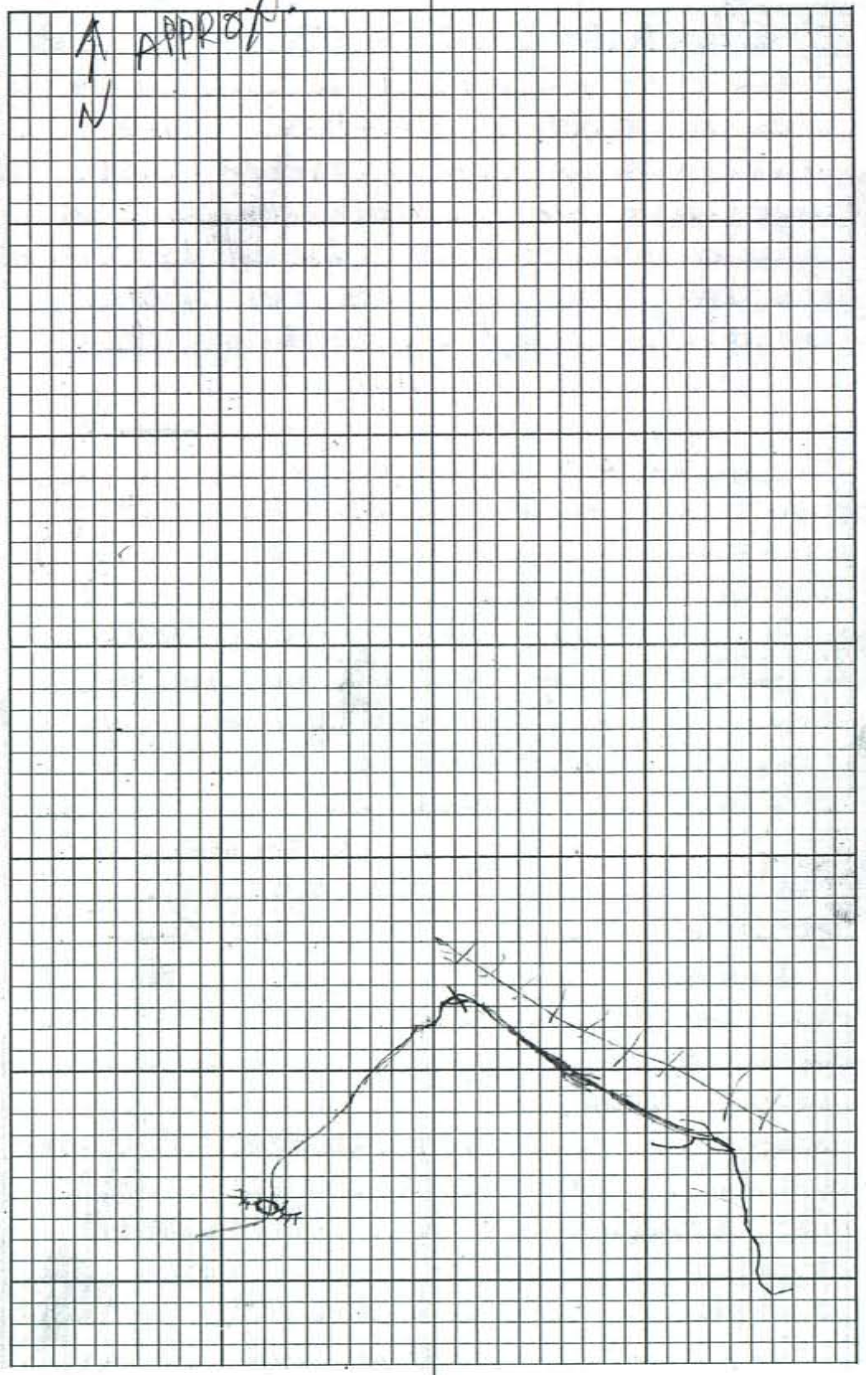
Friday, July 27th, 1984 (Cont'd)

84209PRØ · 03011205

Lt gray, locally pale bluish-gray vuggy granular massive silica with moderate Qtz veining up to 1/4" wide with vugs and banding. Most veins are small. Volcanic texture is very faint.

84210PRØ · 03011105

same as 209 except slight decrease in % Qtz veining total in rock. Still strongly silicified to mod. silicified



August 2nd, 1984, Thursday

84236PRØ · 06041105
Green wkly argillized grading locally into moderately silicified lithic tuff with moderate green propylitic minerals. No pyrite; wk quartz stockwork veining, banded, variable in size from hairline to ½ cm. Some veins vuggy and containing dk red SiO_2 + Hematite.

84237PRØ · 06011205
same as 236 except the Qtz stockwork veining is of moderate intensity. No pyrite here either

84239PRØ · 03021105
Pale green and lt. gray wkly argillized lithic tuff with wk quartz stockwork veining. No visible pyrite, but there is some jarosite + hematite on fractures in moderate amounts. Also goethite too.

84240PRØ · 06041205
wkly to mod. silicified dk green propylitized lithic tuff with moderate quartz stockwork veining. Definite increase in the size of the veins. 1 foot on the ophill end of channel rock chip sample is vuggy & gossanous with oxidized disseminated pyrite.

August 2nd, 1984, Thursday (Cont'd)

84242PRØ · 06011105
Dk green wk to mod. silicified propylitized lithic tuff with weak quartz stockwork veining but the veins are large, up to ¼" wide. No visible pyrite but there is moderate jarosite and hematite on fractures.

84244PRØ · 06011305
Gray green strongly silicified rock with faint fragmental volcanic texture preserved. Trace fine dissem. pyrite. Strong quartz stockwork veining ranging from hairline to ¼" wide. Rock very cherty looking, fine, cryptocrystalline. Veins are granular white Qtz. Much Jarosite & hematite on fractures.

84246PRØ · 03011105
Lt. gray locally green propylitized lithic tuff wkly to mod. silicified but locally strongly silicified and chalcedonic. wk qtz stockwork veining, narrow things; Trace pyrite dissem. locally. Weak to mod. Jarosite and hematite on fractures locally.

August 2nd, 1984, Thursday (Cont'd)

84247PRØ·03021105 5 ft horiz. channel
Wkly argillized to mod. argillized pale greenish-gray lithic tuff with wk qtz stockwork veining; veining locally strong though. No visible pyrite but very strong Jarosite + hematite on fractures. Only tiny localized patches that are strongly silicified.

84249PRØ·06021205
5 ft horiz. rock chip channel sample. Same as #247 except that there has been an increase in the degree of stockwork Qtz veining to moderate instead of weak.

84251PRØ·06011205
5 ft horiz. channel rock chip sample Wallrock is strongly to mod. silicified or wkly argillized lithic tuff with moderate Qtz stockwork veining; no visible pyrite, but rock is jarosite & hematite stained on fractures.

August 3rd, 1984 Friday

84252PRØ·06021105
5 ft horiz. channel rock chip sample. Pale grayish-green lithic tuff, wk propylitic, wk argillized locally almost scaly looking(?) Weak Qtz stockwork veining. No visible pyrite but there is moderate Jarosite + hemat. on fractures. The rock has a bleached appearance to it.

84254PRØ·03011305
5 ft horizontal channel rock chip sample. Pale gray to dk gray wkly to locally strongly silicified and veined rock with faint volcanic textures. Qtz veins are sugary banded white & colorless Qtz with large vugs. Small hairline veinlets of chalcedonic appearance. Minor disem. pyrite assoc. w/ areas of strong silicif. The areas of strong silicification are zones of silica flooding adjacent to highly veined zones that show some brecciation.

84257PRØ·03011205
4 ft horiz. rock chip channel sample. Pale gray mod to strongly silicified, wk-mod. Qtz stockwork veined lithic tuff. Textures better preserved than in #254. No visible pyrite.

August 3rd, 1984 Friday (Cont'd)

84258PRØ: 06011305
Dk bluish-green, strongly propylitized strongly silicified, strongly Qtz veined rock with faint volcanic texture. No pyrite visible. Veins are upto 1/4" wide and are both vuggy granular white and colorless Qtz locally banded, and some chalcedonic veinlets with red bands of jasper brecciated in the veinlets.

August 7th, 1984 Tuesday

84260PRØ: 06011205
Med. bluish-green, propylitized mod to str. silicified, mod Qtz stockwork veined lithic tuff. No visible pyrite.

August 8th, 1984 Wednesday

Survey in all anomalous gold samples.

15	0.330	previously surveyed in July.
26	0.055	
29	0.014	
32	0.030	
50	0.075	
60	0.017	
61	0.012	
72	0.062	
81	0.015	
99	0.020	
106	0.037	
111	0.120	3.72
112	0.062	3.00
119	0.052	
135	0.015	
148	0.017	
155	0.039	
162	0.019	
176	0.015	1.78
193	0.029	

August 8th, 1984 (Cont'd)

Stake at Holes 2a & 2b to sample 50

132°, +1½°, 38 ft.
124°, -10°, 300 ft.
120°, -8½°, 76 ft.

sample 50 to the borderline between sample 60 & 61.

300°, +8½°, 76 ft.
272°, +32°, 98 ft.

Sample 60/61 to sample 72.

227°, +27°, 93 ft

sample 72 to sample 81.

291°, +11°, 228 ft.
152°, +14°, 194 ft.
152°, +10°, 39 ft.

sample 81 to sample 176

332°, -10°, 39 ft
332°, -14°, 194 ft.
291°, -6°, 121 ft.
278°, -4½°, 284 ft.
259°, +3°, 282 ft.
242°, 0°, 232 ft.

sample 176 to sample 162

170°, +46°, 44 ft.
175°, +41°, 45 ft.

sample 162 to 155

299°, -5½°, 105 ft.

August 8th, 1984 Wednesday (Cont'd)

sample 155 to sample 148

350°, -30°, 85 ft.

sample 148 to sample 135

331°, -21°, 67 ft.

sample 135 to sample 193

84°, -13½°, 95 ft
55°, -30°, 80 ft

sample 193 to sample 119

235°, +30°, 80 ft.
355°, -26°, 92 ft.

Sample 119 to 112/111 line

32°, -29°, 70 ft

Sample 111/112 line to sample 106

312°, +3°, 49 ft

Sample 106 to sample 99

8°, -16°, 38 ft

August 8th, 1984 Wednesday (Cont'd)

84265PRØ-06011305
dk bluish-green propylitically altered, mod. to strongly silicified, strongly Qtz stockwork veined lithic tuff, Minor goethite on fractures.
Veins are hairline upto ½ cm.
No visible pyrite, but there is Jarosite and melanterite on fractures.

84268PRØ-06011205
Same as 265 except only moderatly Qtz stockwork veins that are narrower. Visible pyrite associated w/ Qtz veins.

August 9th, 1984 Thursday

In conversation w/ Ted in A.M.

given claims # covering Ed DeBoli's ¼-¼ section.
#23 #25 and west ½ of W½ of #27
location posts are in the clear.

Patented claim cuts into claim #29.

Longyear bid:
Going to Parker Mtn 16th to 18th
then to Reno. 19th Sunday

August 9th, 1984 Thursday (Cont'd)

84283PRØ-02021101
Lt gray slightly bleached and argillized lithic tuff. Minor green minerals on fracture planes. Wk narrow Qtz stringers in the uphill 1 foot at the end of the 5 ft channel sample. Otherwise no Qtz veining in the remaining 4 feet.

August 10th, 1984 Friday

Jaime wants Roberts final salary distrib. real soon.

Reclamation work at Fairview
Reclamation work at WIS & TUF
Flush out Rome warehouse wed.
Flush out Bridgeport office. Mon & Tue.
Fairview 5 miles of roads & trenches.
5-6 day job then reseeding
Cat out of ELY

Grant can't get free to do work at WIS & tuf.

Coates drilling bid looks good.
Need to talk to cat operator on the reservation.

Come-up with some things to look at
Silver Creek, OR.
Iron Mountain, CA.
Utah properties

August 28th, 1984
Coates Drilling Crew arrived on the scene this morning at quarter to nine.

Had to unload the skid-rig off the semi- on Indian Reservation land. Had Bruce Mull scrape a ramp near the spring to unload.

★ Must remember to reseed this scraped area with some Crested wheat grass.

★ Catskinner's phone # 575-2278 George or Bruce Mull.

Drillers set-up and left at 5:00.

★ Must remember to notify Ray Garcia when we need to pick-up water.

★ Remember to have Gordon fix up the bottom of Big Mouth Creek.

Aug. 29th, 1984 Paiute Drilling

Began Paiute Drilling, Hole 1
bearing 225°, -60°

The drillers used a rock bit for the first 8-10ft or so to set a casing.

0-10 ft lost.

10-16.0' 100% recovery!
Rock is purple coarsely lithic tuff with green propylitic minerals form'g along fractures. wk fract'g

16.0-26.0' ≈95% recovery
Rock is still purple coasely lithic tuff with increased amount of green propylitic minerals on fractures. Fracturing increasing to near mod. Decrease in recovery due to clay seams, limonite-stained, along fractures that cut the core at a low angle

26.0'-36.0' 100% recovery
26-28' purple coarsely lithic tuff possibly dacitic. w/ minor sugary qtz veinlets.
28-32' pale gray-green wkly silicified tuff w/ limonite-coated fractures. Looks bleached.

32-36.0' Same purple coarsely lithic tuff. Some greenish-gray
(Cont'd) →

8-29-84 Paiute Hole 1 (Cont'd)

26.0 - 36.0' (Cont'd)
gougy material on the larger fractures and on the borders of the altered zone from 28-32'. Fracturing is still weak to moderate.
The 4 ft altered zone is probably a sign that the Paiute Fault Zone is close at hand. Still making 10ft runs, but recovery has been good so what the heck.
Slight increase in propylitization with depth. Green min'ls on fracts and replacing some of the lithic clasts.

100% recovery

36-46.0' Same wkly argillized (from weathering?) purplish-brn coarsely lithic tuff, from 36-44' with limonite-stained, thin clayey-gougy zones at the major fractures 44-46' there is a noticeable increase in green propylitic min'ls both in the rock and on the fractures. Fracturing weak to moderate throughout zone.
From 45-46' there are some narrow sinuous fracture fillings, lt. gray-white, that could either be clay or alunite?

46-56.0' Same as 44-46' with the same lt. gray-white fracture fillings. Minor limonite along

8-29-84 Paiute Hole 1 (Cont'd)

46.0 - 56.0' (Cont'd)
fractures. [redacted] Wrong.
Highly propylitized from 46.3 to 48.5'. Minor amounts of strong silicification occur @ 47.5' where some clasts in the tuff have been replaced by silica, and the fractures around the boundaries of the clasts are rimmed with Qtz (vein-type). [redacted] 100% recovery

56.0 - 66.0' 100% recovery
Basically the same as the previous run. No Qtz veining but there is an increasing amount of small clasts in the lithic tuff that have been replaced by silica. They appear to be random in nature. Slight increase in amount of soapy bluish-green and dk green propylitic minerals on fractures.

66.0 - 76.0' 100% recovery
Grayish-green propylitically altered lithic tuff. Lesser amount is purplish-brown. Increased amount of soapy gray-green mnls on fractures. Chlorite?

(Cont'd) →

8-29-84 Paiute Hole 1 (Cont'd)

66.0 - 76.0' (Cont'd)
No Qtz veining. Rock is becoming harder but possibly due to lack of weathering? rather than silicification? Large amounts of soapy material on fracture surfaces. Minor # of clasts in the lithic tuff that show selective replacement by SiO_2. Moderately fractured.

76.0 - 86.0' 100% recovery
No Qtz veining. Basically the same as previous run. Increased propylitic chlorite on fractures, now a dominant %age of the rock. Could be a result of argillization. The chlorite (?) is very soapy and typically fills fractures. Moderate fracturing. Red-brn clasts of coarse size up to 1" across, Rarely one will show a bit of silicification.

86.0 - 96.0' 100% recovery
No Qtz veining. Gray-green chloritized & epidotized lithic tuff with limonite & goethite on fractures. Fair competant rock 86.0 → 87.7'.
87.7' → 93.8' the rock becomes highly fractured, sheared, and locally gougy.
(Cont'd)

8-29-84 Paiute Hole 1 (Cont'd)

86.0 - 96.0' (Cont'd)
Only moderately fractured but still well propylitized from 93.8 → 96.0'. This must be the transition zone into the Paiute Fault Zone?

96.0 - 106.0 100% recovery
Not Qtz veining. Same as 93.8 → 96.0, mod fract'd, propylitized lithic tuff w/ relict texture preserved. from 96 to 101.9. Sharp gradation at 101.9 to a soapy greenish-gray epidote + chlorite rock with no textures preserved. Strongly propylitized. Trace limonite on fracts, and fracturing is ~~str~~, but rock looks very sheared and gougy, but it somewhat competant even with its higher clay content. Minor hematite on fracts. This gougy zone continues from 101.9 → 106.0
Slight increase in limonite on fracts, increase in fracts in last 12". Trace alunite veinlets at 98.0'

106.0 → 116.0' 100% recovery
106.0 → 112.2' is the continuation of the chloritized & epidotized zone that was gougy-looking and had no lithic tuff
(cont'd)

8-29-84 Paiute Hole 1[redacted] (Cont'd)

106-116.0' (Cont'd)
texture preserved. From 112.2 → 116.0' one can see the lithic tuff texture. Core from 108.0' → 116.0' is wkly pyritic with minor fine-grained aggregates disseminated in the rock. Though the texture is recognizable, the rock is still strongly propylitized. Minor increase in fracturing from weak increasing to mod. in the last 1 ft.

116.0 - 126.0 100% recovery
116.0 → 120.4 same as 112.2 → 116.0 from above. Trace hematite on wk to mod. fracture faces. At 120.4 there is a pencil width milky Qtz vein that diagonally cuts the core. It is not banded. From 120.4' the fracturing is mod. to str. with limonite occurring on fracts. Veining is weak and there is a minor amount of SiO_2 flood'g along borders of veins. Rock still propylitized strongly and argillized moderately. Wkly pyritic too. Lithic tuff texture preserved. Silicif'd patches @ 124.'

126.0 → 136.0' 85% ~~90-98%~~ recovery
From 126.0 → 134.5' we have
(Cont'd)

8-29-84 Paiute Hole 1[redacted] (Cont'd)

126.0 - 136.0' (Cont'd)
strongly fractured, moderate FeOx stained (goethite, hematite, limon.) propylitized lithic tuff. Localized silica flooding of the rock between 128.0' and 134.5', with the silica flooding becoming the dominant lithology toward 134.5'. Very strong fracturing at the lower end. 134.5 → 136.0 is massive gougy gray pyritic clay with coarse cubes of pyrite up to 1mm, < 1% or weakly pyritic. Some propylitic minerals in the clay. From 133.7 to 134.5 there is a gradual transition from silica flooding to increasing clay content with depth. Then a sharp fault (?) contact with the massive textureless clay.

136.0 → 146.0 100% recovery
136.0 → 137.5' more massive pyritic clay like from 134.5 → 136.0'.
137.5 → 138.8' Less argillized and strongly propylitized rock with destroyed texture and up to 1% pyrite. (Wk. Py.)
138.8 → 140.3' back to massive greenish-gray to gray-green clay with 1-3% Pyrite (Wkly Py).
140.3 - 143.0' Less argillized, str. propylitized faintly volcanic rock w/ <1% dissem. pyrite. Mod. argillized but some str. argillization along fractures. Mod. fract'g
(Cont'd) →

8-29-84 Paiute Hole 1[redacted] (Cont'd)

136-146.0' (Cont'd)
@ 143-145.7 Rock is mod. argill, 2-3% pyrite dissem throughout. Minor calcite(?) veinlets and red hematite filling fractures. 145.7 → 146.0 Same as 140.3 → 143.0 Mod. argill w/ str. clay & argillic on fracts. Very minor Qtz stringers

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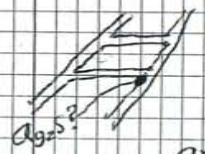
146.0 → 156.0' ≈ 95% recovery or so. I'll continue the log under tomorrows notes,... this FLU is really gettin' to me. worked from 6 A.M. to 4 P.M.

GORDON DRILLED TO 203' at the end of his shift, then Lucky took over.

I showed up at 3 A.M. and shut down the hole at 335'. We passed out of the zone at 267', so we drilled 67 feet past the zone, I had originally intended to stop it 50 ft past, but showed up too late. Recovery looked good on Lucky's shift,... They had only one bad run where they got 80% recovery. Worked 2 A.M. to 4 A.M.

8-30-84 Paiute Hole 1[redacted]

146.0 → 156.0 ≈ 95% Recovery
Light Reddish-brown, possibly wkly argillized coarsely lithic tuff with 1-2% fine disseminated pyrite
Weak Qtz stockwork veining with red hematite associated. There doesn't appear to be any brecciation associated with the veining, they just fill cracks.
@ 153.0' there is a ladder-type vein and a splotch of black in the vein that could be argentite? It looks like a smattering of graphite dust in the Qtz vein.



146-151.0 wkly fractured
151.0-155.7 moderately fractured with clay or gouge filling fracts.
155.7-156.0 wkly fractured.

156.0-166.00 ≈ 93% recovery
156.0-158.7 same as the last interval bleached lt. reddish-brown to gray, 1-2% pyrite and wk qtz stockwork veining At 158.7 it grades into dker reddish-brown coarsely lithic tuff with < 1% Pyrite and no quartz veins or patches of silicification (Dead). Very wk propylit'n and it is only in the lithic fragments. The rock is clayey and possibly wkly argillized? This lithology continues through to 166.0' and beyond.

8-30-84 Paiute Hole 1[redacted] (Cont'd)

166.0 – 176.0' 100% recovery
166.0 → 168.7' Same dead looking stuff as 158.7–166.0 except with disseminated pyrite being almost extinct now. At 168.7' there is a sharp but gradational boundary into lt gray-brown bleached, pyritic lithic tuff with very weak quartz stockwork veining. This is our productive rock unit. It ~~is~~ has only a slightly higher increase in green propylitic minerals that the previous type. 1-2% disseminated pyrite. Hematite assoc. w/ wk qtz veinlets. Some of the lithic fragments, especially the coarser ones, are pyritized and strongly silicified, but there is no other silicification flooding types assoc. w/ the veins themselves. Wk silica flooding for 2mm bordering a vein at 172.0'. Wk Fracturing w/ greenish-gray clay fillings. Pyrite has a reddish oxidized cast to it.

176.0 – 186.0' 100% recovery
176.0–179.9' same as 168.7–176.0' with decreasing pyrite, decreasing fracturing with depth. At 179.9' there is a thick Qtz vein assoc. with pyrite and some minor brx'n. Fracturing becomes very strong here. Fractures are filled with either Qtz veinlets, clay, or green

8-30-84 Paiute Hole 1[redacted] (Cont'd)

176.0 – 186.0' (Cont'd)
chlorite? Pyrite increases here. This zone continues thru 182.8' Then there is an abrupt change. From 182.8 – ft we hit a black fine-grained dike with spheroid-shaped white feldspar phenocrysts in a black aphanitic matrix. There is a 1 mm thick selvage of white sericitic or muscovite mica at the contact, then a fine-grained chilled border of the dike 3/8" thick that contains > 5% dissem. pyrite. The dike itself contains minor dissem. pyrite. A basaltic dike of fine-grained texture.

186.0 – 196.0' 100% recovery
The same black unaltered post-mineralization basaltic dike from 186.0 to 192.0'. Trace dissem clots of pyrite. From 192.0' to 195.0' There are minor thin calcite veinlets flatly cutting the core. 195.0 – 196.0 same as before. Very weak to non-existant fract'g in this dike.

196.0 – 206.0' 98% recovery
The same black unaltered basaltic dike from 196.0 to 203.9' where there is a sharp contact and a 1/4" thick chill zone with 1% dissem very fine pyrite...

(Cont'd) →

8-30-84 Paiute Hole 1[redacted] (Cont'd)
196.0 – 206.0' (Cont'd)

minor thin white calcite veins cross cut the dike throughout. From 203.9 – 206.0' is medium gray with green, coasely lithic tuff, wkly propylitized, with minor thin calcite veinlets, no pyrite and no qtz veins. This zone doesn't look bleached like before, in the mineralized zone. There are some vuggy white calcite veinlets filling fracts. Slight increase from 0 to minor pyrite w/ depth. Hematite-filled fracture at 205.9'.

206.0 – 216.0' 100% recovery

Same as 203.9 to 206.0' with minor pyrite disseminated. The rock is slowly-gradationally becoming more bleached, more pyritic and more Qtz veined with increasing depth.

@ 208.3 there is a 3/8" thick Qtz + adularia vein with hematite + calcite + clay on the borders. Vein is pyritic. Adularia looks milkier than qtz with about the same hardness, and monoclinic cleavage. Also minor calcite + chlorite + pyrite hair-line veinlets about too. Rock wkly fract'd. @ 211.0' a 1/4" thick Qtz + calcite vein.

From 211.8' to 212.5' There is a

(Cont'd) →

8-30-84 Paiute Hole 1[redacted] (Cont'd)
206.0 – 216.0' (Cont'd)

spider-web network of hematite + clay fracture fills, calcite fract. fills, and qtz veinlets. Fracturing in the rock becomes moderate here, otherwise no change. This same thing occurs at 213.8 → 216.0' Strongly fractured zone with moderate qtz stockwork veining, vuggy with clay in vugs. Also small calcite veinlets and hemat + clay veinlets.

There is an increasing amount of silicified lithic fragments in the rock from 206 – 216'. Propylitiz. is still weak. Py assoc. w/ veinlets.

216.0 – 226.0' 97% recovery

From 216.0 to 217.6 is the same strongly fractured, moderately Qtz veined rock as before.

217.6 to 222.5' is Lt. tan-gray, wkly fract'd, wkly Qtz veined, possibly wkly argillized lithic tuff ~~with smaller lithic fragments~~. 2-3% dissem. pyrite. greenish clay filling fracts. Trace propylitic minerals. Increased silicified patches and silicif'd lithic clasts with heavy pyrite assoc'd.

222.5' – 224.0' ~~Moderate~~ STRONG fracturing again and strong qtz stockwork veining (> 25% of rock). 5-10% fine dissem Pyrite. Some calcite veinlets. From 224.0' to 226.0'

(Cont'd) →

8-30-84 Paiute Hole 1[redacted] (Cont'd)

216-226.0' (Cont'd)

wk to mod. fract'd lt. gray to tan lithic tuff w/ 3% decreasing to < 1% dissem. pyrite w/ depth, and decreasing clay + pyrite fracture fillings. Decreasing silicified lithic clasts too.

226.0 - 236.0' 100% recovery

Same lt. gray - tan ~~unaltered~~ wkly argillized coarsely lithic tuff w/ occasional silicified lithic clasts. Minor clay + pyrite fracture fillings otherwise < 1% dissem. Py. Monotonous sequence, probably deeper than sin too.

234.5 to 235.2' wk quartz veining. All veins parallel to one another. Some clay in vein. Veins milky white, vuggy; slightly banded. May have possible adularia (?) not sure. 235.2 - 236.0' same as 226.0 - 234.5'.

236.0 - 246.0'

From 236.0 to 236.7' The core changes from lt. gray - brn to gray. Color about the same tone of gray without the brown.

236.7 to 240.0' gray core w/ wk pyrite, wk argillizn, minor silicifn of lithic clasts.

240.0 to 240.5' is same with ½" thick banded Qtz vein (Cont'd) →

8-30-84 Paiute Hole 1[redacted] (Cont'd)

236.0 - 246.0' (Cont'd)

Several episodes of veining. Banded milky Qtz and Silica + hematite cut by vuggy, milky Qtz with yellow stain. 240.5 to 244.5' same as 236.7 → 240.0'.

244.5 - 246.0' core changes to lt. greenish gray color with wk pyrite, wk argillizn, and a wk hint of propylitization. Still silicif. of lithic clasts in the tuff. Wk to non-existant fracturing.

246.0 - 256.0' 100% recovery

~~246.0 - 248.5~~ Same as 244.5-246'

There is a narrow Qtz veinlet at 248.5' and there is a 1" wide pale green strongly argillized zone on a fracture at 250.5'. There is no increase in pyrite in this zone. There's another clay-filled fracture 1" wide at 255.1'. Another minor wkly pyritic clay-filled fract. at 256.0'

256.0 - 266.0' 100% recovery

Same as the monotonous sequence decribed before... 256.0 - 257.5' then color changes slightly to medium greenish gray. From 257.5' to there is a number of small roughly parallel, thin clay-filled fracts with strong pyrite assoc.

257.5 - 261.2' wkly argillized.

(Cont'd) →

8-30-84 Paiute Hole 1[redacted] (Cont'd)

256.0 – 266.0' (Cont'd)

261.2 – There is now about 1-3% fine dissem. py, and the rock is becoming very weakly silica flooded.

wk qtz veining. One vein ¼" wide, milky, highly pyritic, very vuggy and parallel to length of core. This vein zone starts at 262.1' to 264.0' and widens to 1⅜" at the deeper end. Thin area of strong to moderate silica flooding ⅛ to ¼" wide bordering the vein.

264.0 to 266.0 No Qtz veins but rock is still med. greenish-gray wkly propylitic lithic tuff with 2-3% pyrite disseminated in it and wkly silica flooded.

Big Qtz vein occurs at 266.0' and continues into next "run". See next description...

266.0 – 272.0 85% recovery

266.0 – 266.8' Dk gray silicified Qtz stockwork vein zone with large milky, vuggy qtz veins; vugs filled with drusy Qtz and strong pyrite. Recognizable adularia in the vein.

266.8 – 267.1' med. greenish-gray, wkly argillized coarsely lithic tuff that is locally silica flooded in patches especially where

8-30-84 Paiute Hole 1[redacted] (Cont'd)

266.0 – 272.0' (Cont'd)

Qtz veins appear such as at 267.1' There are wk. fractures which are filled with clay + pyrite. Otherwise rock has only minor dissem. pyrite.

269.1 – 272.2' Back to the wkly argillizd lithic tuff w/ str. argillizn and wk to mod. pyritiz on fracts. only. Trace Qtz veinlets. A patch of black argentite (?) 270'

8-30-84 started to work 6 A.M.

Set-up 7:00 am to 9:30 A.M. Commenced drilling hole 1-B. at 160° azimuth, -60°

Gordon drilled to 139 ft by 4 P.M. Leaving at 12 AM to check on progress of night crew. They should be below 300 ft at that time. Gordon drilled to 166.0' by 5:00. The night crew drilled to 316' by 5 A.M. and were still in the Paiute Fault Zone. Work 12 A.M to 4 A.M.

8-31-84 Started to work at 8:30 A.M. Gordon drilled to 380 ft. drilled out of the Paiute Fault at 329 ft. On hole 2[redacted]

Ready to set-up on hole [redacted] 3

8-31-84 Paiute Hole 1[redacted]

[redacted]

266.0 - 272.0' 85% recovery
272.0 - 276.0' 100% recovery
276.0 - 286.0' 81% recovery
286.0 - 296.0' 100% recovery
296.0 - 306.0' 98% recovery
306.0 - 316.0' 94% recovery
316.0 - 326.0' 92% recovery
326.0 - 335.0' 91% recovery

8-31-84 Paiute Hole 1[redacted]

[redacted] 271.2' - 277.5'
Wkly argillized greenish-gray coarsely lithic tuff with a small number of dark gray selectively silica replaced lithic clasts. Trace disseminated pyrite. No clay filled fractures, rock is pretty tight.

277.5 - [redacted] 277.6'
Same as above except with tiny clay + pyrite + dark FeOx fracture fillings.

277.6 - 279.2'
Same as 271.2-277.5'

279.2 - 279.4'
Patch of dk gray-black, strongly silicified coarsely lithic tuff with sharp but irregular boundaries. Minor py assoc. especially on the borders of this zone.

279.4 - 285.7'
Wkly argillized greenish-gray coarsely lithic tuff with a small number of strongly silicified lithic clasts. Trace dissem. py with silicification. Zone is moderately fractured and has green-gray gougy clay on fractures that has minor amounts of fine pyrite in it.

285.7 - 287.3
Same as 279.4-285.7 except wkly fractured with same type of fracture fillings.

8-31-84 Paiute Hole 1[redacted] (Cont'd)

287.3 – 291.2'
Rock is basically the same wkly argillized coarsely lithic tuff except that the color of the groundmass has now picked-up some hematite so it is lt reddish-brown with a touch of gray. Clasts show wk pale green color (propylitic?) No pyrite visible. No clay filled fractures.

291.2 – 293.1'
Rock stays the same except increase in hematite content of tuff matrix, giving the rock a dker brick red color.

293.1 – 299.0'
Back into the lt. reddish-brown colored lithic tuff, but this time there are fractures (wk) with greenish clay + pyrite filling. There is a hematite + clay + pyrite fract. filling @ 293.4'. There's a Qtz + adularia + hematite + pyrite vein 3/8" wide @ 295.6'. There is a gradual increase in clay + py fract. fills from 295.0' onward

299.0' – 301.4'
Color change from lt. reddish-brn to med. gray with faint tinge of green. Still an abundance of

8-31-84 Paiute Hole 1[redacted] (Cont'd)

299.0 – 301.4' (Cont'd)
clay + pyrite ± hematite fracture fillings of various orientations.

301.4 – 302.0'
Dk gray-black strongly silicified patch of coarsely lithic tuff. Sharp irregular contact with wallrock.

302.0 – 302.8'
Same as 299.0 – 301.4'

302.8 – 307.6'
Same as 299.0 – 301.4' except there now appears a network of red hematite + Qtz + pyrite + clay veinlets varying from hairline up to 1" thick that form an irregular stockwork. Most are tiny veinlets.

307.6 – [redacted] 311.6'
Same as 299.0 – 301.4' with an now moderate amount of clay + hematite + pyrite fracture fillings.
[redacted] There is a Qtz + hematite + pyrite + clay vein 3/8" wide at 310.3'

311.6 – [redacted] 324.5'
Lt gray, [redacted] wkly argillized, trace-pyritic, coarsely lithic tuff with grayish-green clay filled fractures occasionally (weak)
There is a clay + hematite + pyrite fracture filling with a bleb of gray silica in it at 316.0!

(Cont'd) →

8-31-84 Paiute Hole 1[redacted] (Cont'd)

311.6 – 324.5' (Cont'd)
@ 317.9' there is a ¼" wide hematite + clay + pyrite fract. filling. Same at 323.5' & 324.5'.

324.5 – 326.8'
Slight color change to lt. reddish-brown matrix in tuff. Incr. in hematite content. Otherwise no difference.

326.8 – 327.3'
Sharp irregular contact into and out of a patch of dk gray-black strongly silicified coarsely lithic tuff with 1-2% very fine-grained dusting of pyrite.

327.3 – 327.7'
Same as 324.5–326.8' with a hematite + clay + pyrite + Qtz fract. filling at 327.7'.

327.7 – 334.0'
Color change to brick red coarsely lithic tuff with wk argillizn, some minor silicification of lithic clasts, minor clay + pyrite fracture fillings and minor green minerals replacing some of the lithic clasts (wk propylitizn).

334.0 – 335.0'
Color change to lt. gray color slightly bleached. Increase in fracturing and clay fracture fillings.
Stopped drilling. TD

8-31-84 Paiute Hole 1[redacted] (Cont'd)

Stopped drilling at 335' because the last recognized Qtz veining was at 270' and I wanted to drill 50' past the zone. Obviously I screwed-up a little bit because there was 5 ft section of Qtz + hematite + pyrite veining between 302 and 307', but at 2 A.M. I didn't recognize these veins as such. Should have drilled to about 360 ft. It certainly looks as though the zone has pooped-out at 307', but it is always good to be extra sure. Sorry about that.

Start Logging Paiute HOLE 2 [redacted] on 8-31-84 also.

0 – 10 ft lost when casing was set because an oversized rock bit tri-cone was used.

The following will be a list of intervals and their % recovery.

Hole 2 [redacted] 160°, –60°
acid test gives –62°

8-31-84 Paiute Hole [redacted] 2

0-10'	No recovery
10.0 - 16.0'	93% recovery
16.0 - 26.0'	95% recovery
26.0 - 36.0'	70%
36.0 - 46.0'	91%

8-31-84 Paiute Hole [redacted] 2

10.0 - [redacted] - 24.1'

dark reddish-brown coarsely lithic tuff; unaltered, unbleached, Minor development of green soapy-looking chlorite + epidote on fractures.

@ 18.7' there is a 1" thick zone of clay + epidote + chlorite on a fracture. Rock texture destroyed. A characteristic of this rock unit regardless of whether altered or unaltered is the presence of selectively replacing of silica in some of the lithic clasts of the tuff. There is no apparent pattern to the silicification which could have occured elsewhere but was reworked?

24.1 - 28.2'

Sudden increase in amount of fractures. These fractures have green clay and propylitic minerals, yellow-brown limonite staining, and dendritic MnO_2 growths assoc. Othewise the same rock. Fracturing is strong in this zone.

28.2 - 30.2'

Zone of sandy material. Could be a fault or a big crack in the rock with so pseudo-soil material in it? (Yea, sure Payne).

30.2 -

Notes continued later in this notebook.

9-2-84 Paiute Hole [redacted]3 Sunday
226°, -25°

Set-up on hole Friday morning and afternoon. Began drilling at 3 P.M. drilled 26 ft.
Night Shift drilled 26-88 ft then got the rods stuck at 3 A.M.
Day shift on Saturday spent all day reaming hole with HX rods and got the rods free at 6 P.M.
Saturday night shift drilled 88' to 174'. ~~Drilling~~ Recovery not great
Sunday day shift drilled 174' to 225' TD at 12 P.M. or so.
Good recovery.

Acid test gives -24° instead of -25°

9-2-84 Paiute Hole [redacted] 3

Recoveries

84-88'	100% recovery	
88-96'	84% recovery	
96-103'	100%	
103-112'	98%	
112-120'	90%	
120-122'	65%	
122-126'	78%	
126-133'	67%	
133-137'	73%	
137-143'	20%	
143-153'	94%	
153-160'	94%	NIGHT SHIFT ↑
160-166'	80%	
166-174'	59%	[redacted]
174-182½'	98%	
182½-190'	99%	DAY SHIFT
190-195½'	100%	
195½-205'	100%	
205-211'	89%	
211-215'	95%	
215-219'	93%	
219-225'	100%	

9-2-84 Paiute Hole [redacted] 3

84 – 89.3'

Well-fractured Pale greenish-gray wkly argillized lithic tuff; No pyrite, no Qtz veining. There is a large amount of heavily limonitic clay filling the fractures. Small number of silicified lithic clasts in the rock, but this is also typical in unaltered rock. At 86.7 ft there is the appearance of trace pyrite disseminated in the rock, and the fracturing becomes very weak, and the rock is tight. Oh, also the entire sequence has a slightly bleached appear-ance to it.

89.3 – 99.8'

The rock is the same as 86.7 – 89.3' except for the appearance of wk. Qtz + adularia + pyrite veinlets that are forming a weak stockwork. The pyrite content is still <1%. Minor pyrite disseminated in the rock too. These veins are max. 1/8" thick or less, and the larger veins have silica flooding on the borders for up to 1" on either side. Some Clay + limonite fracture fillings in this zone too. Fracturing still weak. Minor limon on fracts. The Qtz + adularia + pyrite stockwk veins become moderate at 91.2' – 92.8'

9-2-84 (Sunday) Paiute Hole [redacted] 3 (Cont'd)

89.3 – 99.8'

There are patches locally silicif'd associated with clusters of Qtz veins throughout the interval. At 93.8' Veining becomes moderate to strong and pyrite increases to 1% dissem. in rock. There is a slight increase in fracturing of the rock. Patchy silica flooding in this zone 93.8 – 98.6' Pyrite gradually decreases but to minor with depth. The veins are vuggy with white clay in them. There are dker green mineral envelope surrounding the veins too. Veining moderate from 98.6' to 99.8'

99.8 – 108.5'

Olive-gray moderately argillized lithic tuff with moderate fractures and strong argillization on the fracts. Minor soapy green epidote (?) + chlorite on fractures. Trace pyrite dissem. At 100.4' there is a color change to lt. green with a tinge of tan, and the start of more wk ~~[redacted]~~ ~~with [redacted]~~ brecciation of the wall rocks, and filling by massive gray, tan, or green clay. Strong propylitic alt'n on the fracts. No Qtz here. Rock shows mod. argillizn but there are minor wkly silicified patches?

[redacted] At [redacted]' there is wk. Qtz + Adularia
103.3-105.3'

(Cont'd) →

9-2-84 (Sunday) Paiute Hole [redacted]3

99.8 – 108.5'

veinlets forming a wk stockwork, and a slight color change of the rock to lt. green. There is some clay assoc. w/ the veinlets. Veinlets show wk bonding too. Stong Qtz vein at 105.9' – 106.8' Irregular shaped with gray massive Qtz. Plus some reddish-brn hemat. stained Adularia veinlets. Qtz vein 2" wide, cuts core at ∅ angle. Moderate fract'g begins at 105.9' white, tan, or green clay fills fracts.

108.5 – 110.1'

Bleach

Begin zone of strong argillization with tan clay filling fractures and forming clay matrix.
Argillization strong. Color is lt. yellowish-green with darker pieces of lithic tuff as clasts, rounded to angular, matrix-suppt'd. Minor pyrite in some of the silicified clasts but none visible in the matrix. Originally thought this was a breccia but it is just strongly argillized lithic tuff. Most texture in rock destroyed.

110.1 – 113.0'

Bleach

Pale-gray-green completely [redacted] and strongly silicified, previously altered lithic tuff, w/ mod. fracturing and clay filling, and a wk system of tiny Qtz veins in the rock.

9-2-84 (Sun.) Paiute Hole [redacted]3

110.1 – 113.0'

Strong shearing at 110.1 to 110.9'
Strong shearing at 111.8 to 112.4'
Moderate Qtz veining at 112.4 to 113.0'

113.0' – 121.9'

Bleach

Same pale gray-green color mod. to strongly argillized lithic tuff w/ faint preserved texture.
Trace dissem. pyrite.
At 113.8 to 114.4' there is strong silicification and moderate Qtz veining. 114.4 – 119.2 wk Qtz veins
Degree of argiliz incr. w/ depth.
Mod. Qtz veining from 119.2 to and assoc. patchy silicification
Veins show wk bonding, wk vugginess with clay filling (tan).
Sharp contact with silicified rock.

121.9 – 124.6'

Tan gray matrix breccia with gray and red-brn clasts of massive Qtz and silicified tuff in a silicified (originally clay) matrix. Entire rock silica flooded. Most clasts are rounded. Looks like silicified fault breccia.

124.6 – 127.6

Bleached lt. gray strongly argillized zone of shearing. Clay filling open spaces. Minor amount of patchy silicification.

127.6 – 145.2'
Reddish-brown, mod. argillized lithic tuff w/ green and tan clay on fracts (mod.) and minor dissem. fine pyrite. Wk. propyl. on fracts. Sharp but gradational contact @ 127.6'.
Rock gradually becoming slightly bleached to a lt. gray w/ depth, and argilliz'n decreases to weak with depth. Pyrite decreasing to trace amounts with depth.
134.9 – 135.7' wk- Qtz + clay veinlets, that don't form a stockwork. Minor silica flooding on borders of veins, at 135.5 to 135.7' and at 141.8 to 143.0'
At 142.0' to [redacted] there is strong to becoming moderate fracturing w/ depth w/ clay filling.

145.2' – 158.3'
Med. gray, wkly argillized, mod. fract'd lithic tuff w/ trace to minor disseminated pyrite, and mod. amount of clay ± pyrite fracture fillings mostly tan in color. Bleached in general.
At 148.8 to 149.3' there is a patch of dk. gray strongly silicif'd lithic tuff with sharp but irregular borders and ≈ 1% very fine dusting of dissminat'd pyrite.

145.2 – 158.3'
Pyrite increases from ½ to 1%, and there is wk Qtz hairline veinlets and wk silicification of the rock at 153.0' to 154.3';
154.3 to 155.4 Rock is strongly silicif. mod. Qtz + pyrite veined w/ very vuggy stockwork of veins up to 3/4" wide. Some clay fract fills (green). Pyrite minor.
155.4 pyrite incr. up to 1%, Qtz veins weak and tiny. to 158.3'

158.3' – 162.5'
basically same rock as before with color change to reddish-brown fracturing weaker. wkly argill. minor to trace pyrite, minor greenish clay fracture fillings. Incr. hemat. content. Wk tiny Qtz + hematite veinlets but don't form stockwork. Also wk Qtz + clay veinlets with tiny vuggs filled with clay.
At 160.2' Qtz + clay veins moderate.

162.5' – 169.7' Color becomes bleached to lt. gray color Qtz + clay + Py veining still very weak. Slight incr. in argilliz but still weak. No Qtz veining here.
One small Qtz + adularia + clay veinlet at 166.7' and fracturing with depth increases to mod. and gray clay fills the fracts.
Tiny Qtz + hemat unit @ 169.7'

9-2-84 (Sun) Paiute Hole [redacted] 3

169.7' — (Cont'd to Bill's Notes)
Gradually becomes less bleached, less argillized and color becomes reddish-brown due to incr. hematite content in tuff matrix. No Qtz veining
At 174.0' onward the core is bleached to lt. gray color, and still wkly argillized. Ends at 177.2'
Clay fracture fillings w/ minor blebs of Qtz in it at 175.7'
Gray strongly silicified patch 2" in diameter at 177.0'.
At 179.7' Color changes to Med gray due to decrease in hematite content. Silicified pale green patch with no texture preserved.

Bill is logging the hole down to the bottom.

Began drilling casing for Hole 4 [redacted] at 3 P.M.

Hole 4[redacted] is 226°, -58°

On Monday 9-3-84 began drilling hole 5[redacted] at 1 P.M. on Day Shift 11 ft of casing. Hole is 164°, -58°. Hole began is mod to str. argill coarsely lithic tuff.

9-2-84 (Sun.) Paiute Hole [redacted] 4

0 - 21.0' Set casing in bad ground. Heavy clay zone

21.0 - 25.3'
Lt. greenish-gray sheared, mod. Qtz veined zone with much clay on fracts. Strong fract'g. Minor limon. on fracts. to 25.3'

25.3' — 26.2'
Rock lt. gray ~~mod~~ str. argillized lithic tuff w/ green prop. minerals on fractures. Mod. Qtz veining w/ minor hematite assoc. Veins are narrow, colorless, clear w/ no pyrite. Moderately fractured.

26.2 — 30.0'
Orange-brn limonite stained, strongly fractured grey brecciated Qtz vein and silicified lithic tuff. Qtz is massive almost chalcedonic looking. Shows recurrent fault (?) movement? Shear Zone. At 27.0' sharp ~~[illegible]~~ change to Mod. argillized, sheared bright bluish-green lithic tuff w/ strong propylitization, strong fracturing (shearing), mod. qtz stockwork veining w/ FeOx stain, and some patches of silicification assoc. with the veins. Qtz veins up to 1½" wide, and very busted up and limonite stained. No pyrite in this zone. Green-gray clay fills fracts and clay content of

9-2-84 (Sun.) Paiute Hole [redacted] 4

RECOVERIES

0-21.0'	none	(21')	
21.0-27.0'	57%	(6')	DAY SHIFT
27.0-35.0'	100%	(8')	
35.0-39.0'	43%	(4')	
39.0-49.0'	99%	(10')	
49.0-56.0'	91%	(7')	
56.0-66.0'	100%	(10')	
66.0-76.0'	100%	(10')	
76.0-83.0'	100%	(7')	
83.0-85.0'	100%	(2')	NIGHT SHIFT
85.0-95.0'	61%	(10')	
95.0-102.0'	27%	(7')	
102.0-106.0'	100%	(4')	
106.0-115.0'	70%	(9')	
115-122'	100%	(7')	
122-126'	93%	(4')	
126-132'	100%	(6')	
132-136'	90%	(4')	
136-146'	95%	(10')	
146-155'	100%	(9')	
155-163'	71%	(8')	
~~163-166'~~	~~40%~~	~~(3')~~	
~~166-176'~~	~~100%~~	~~(10')~~	
~~176-185'~~	~~100%~~	~~(9')~~	
~~185-195'~~	~~94%~~	~~(10')~~	

(Cont'd later →)

9-2-84 Paiute Hole [redacted] 4

26.2-30.0'

Wall rocks increases with depth. Argillization and propylitization are strong at 30.0'.

30.0'-35.0'

Lt. greenish-gray bleached, strongly argillized, wkly pyritized lithic tuff with only faint preserved textures. No veining of Qtz, only clay. ~~[illegible]~~ Propylitic alt'n still strong.

At 34.2' Pyrite, dissem. increases up to about 1% to 2%.

Very weak, thin Qtz veins appear here too.

35.0-95.0'

Bright bluish-green, strongly propylitically altered, strongly silicified, wkly to mod. Qtz veined, wkly to moderately fractured lithic tuff w/ ~~wk~~ pyrite. Roughly the same as 26.2-30.0'. Large Qtz vein at 35.5' that is very broken. Fractures filled with limonite + clay.

Qtz veins are both massive and gray; and granular, vuggy white to colorless.

At 39.4' the pyrite increases to 1 to 3% dissem. in rock and veins. The rock also is mod. argillized but is variably silicified in irregular patches throughout the interval.

At 45.0' Color becomes more of a med. grayish-green, otherwise the same.

(Cont'd) →

35.0 – 95.0'

At 48.3' (49.1') there is the sudden appearance of vuggy Qtz veins with colorless granular Qtz and yellow-tan barite? on the interior core of the veins. Also there are pure clay veins yellow-tan in color. ~~Pyrite decreased to <1% at this point too.~~

From 52.5' to 56.4' there is heavy amount of limonite + hematite ochre mud filling the large joints.

At 52.0' the core gradually has become a bright bluish-green color again.

A Qtz + pyrite + hematite vein < 1/8" thick at 57.6'

Core changes to a more bleached, less propylitized lt. grayish-green color. With an appearance again of yellow-tan clay fracture fillings and clay in the cores of the Qtz veins, or clay as selvages on the outside of Qtz veins. Veins are not forming stockworks at this point. The veining is weak. Py @ 1%.

At 64.1' to 64.7' there is mod. Qtz + clay veining and 2-3% pyrite.

At 70.8' to 71.5' Mod. Qtz veining and 1-2% dissem. Pyrite.

Another change noted at 57.6' is that there are no more silicif. patches. ~~At 71.5' [illegible]~~

35.0 – 95.0'

At 76.7 – 78.1' mod. Qtz + pyrite veining colorless, white, and dk gray-banded. > 5% Py assoc. w/ veins. Narrow zones of silica flooding and brecc'n accompany some of the larger veins.

At 78.1' to 80.0' pyrite is minor and Qtz veins become wk. non-stockwk. Locally wk. stockwk. 80.0 to 81.0'

At 83.0' there is abrupt change into Mod. Qtz + pyrite stockwork and patchy silicif. w/ dissem pyrite 1-2%. Veins are vuggy, granular clear Qtz assoc. w/ dk green propylitic minerals. Ending at 86.4'.

At 86.4' to 95.0' back to wk non-stockwork Qtz veining and minor dissem. pyrite. Qtz veins are roughly paralel and cut the core at a 45° ∠.

95.0 – 101.6

Mixed lt. green-gray & reddish-brown mod. argillized lithic tuff, with areas of localized silicification and Qtz veining at start of interval and 5% coarse but dissem. pyrite cubes. Then turns into argillized and very sheared-up tuff with minor to trace pyrite. Zone of high clay content.

101.6 – 114.1'

Mottled reddish-brown and lt. greenish-gray, mod. argillized, strongly pyritic lithic tuff (Cont'd) →

101.6 — 114.1'

with minor clay filled fractures. Fracturing of the rock is weak. 102.7–103.3' There is breccia zone w/ open spaces filled by white to colorless and gray vuggy Qtz. Some veins w/ tan clay content too. At 103.3', pyrite content drops to ½ – 1% and color becomes more bleached to a lt. tan-gray color. At 105.8' to 106.9' green propylitic minerals wk to mod. on fracts and hematite increases; Pyrite incr. to 3%. coarse cubes. And minor Qtz veins up to ⅛" occur. At 106.9' core changes color to bleached lt. gray color, pyrite now only minor fine & dissem. At 108.1' to 108.7' Moderate Qtz stockwk veining, vuggy, accomp. by silica flooding and brecciation. Quartz is white to med. gray. At 109.6' wk Qtz veining.

~~At 114.1 to~~

114.1 — ?

- Lt. gray somewhat bleached looking lithic tuff that is mod. argillized, mod. to strongly pyritic, and contains large blebs up to 1½" across of ~~argillization~~ yellowish-green clay and propylitic minerals(?), giving the core a chartreuse cast.

114.1 — ?

Wk quartz veining, roughly parallelling one another. Pyrite begins at 1–3% and increases up to 5% from 116.4' ~~to~~ and decreases back to 1–3% at 117.0'.

- At 120.0' vuggy Qtz + pyrite vein also contains a bluish-gray sulfide or sulfosalt with cubic faces, but no galena cleavage. Darker than galena anyway.
- The wk. Qtz veining was from 114.1 → 121.7'. Mod. to str. veining at 117.0' with brecciation and silicification.
- From 121.7 to 123.0' Rock is same but non-qtz veined and sheared strongly with an increase in clay content.
- From 123.0 to 128.8 Rock is back to same as 114–121, with wk Qtz veins non-stockwork, 1–3% Pyrite dissem., wk to moderately propylitic. ~~[illegible] yellowish-green clay blebs~~ wkly argillized too
- From 128.8 to 132.3' No Qtz veining, trace to minor dissem pyrite.
- From 132.3 to 132.6' Wk. Qtz veining, up to ½% dissem coarse cubic pyrite.
- From 134.7' 2–3% dissem. pyrite in coarse cubes. to ~~[redacted]~~ 139.2'
- From 139.2' to 140.6', 2–4% dissem. pyrite and wk non-stockwork Qtz + clay + pyrite veins.
- From 140.6' to 2–3% dissem. coarse cubic pyrite.

(Cont'd) →

9-3-84 Paiute Hole [redacted] 4

114.1 — ?

- At 142.2 there is a dk gray 1/8" thick Qtz + pyrite vein that is offset slightly by a 1" wide shear zone. Pyrite still 2-3%; wk. Qtz + pyrite veining continues to 144.0'
- At 144.0' to 146.5'; There is a zone of shearing, wk Qtz + pyrite stockwork veins, and minor silica flooding in areas of brecciation and veining. Pyrite moderate.
- At 146.5' to 148.3' color change to med. ~~gray~~ tan-gray, pyrite decreases to minor, and Qtz veining is Qtz + hematite + Py and is non-stockwork, and very weak.
- At 148.3' to 151.8' Appearance of gray almost translucent clay fillings or veinlets that could nearly be mistaken for Qtz veins. Pyrite is minor but locally up to 1%.
- At 151.8' to 155.5'; Moderate large white to colorless, vuggy, granular Qtz + pyrite stockwork veins. 1% pyrite dissem. & in veins. Veins become weaker w/ depth
- At 155.5' [redacted] ; Veins are now moderate and there is 75% clay and 25% Qtz in the veins which range up to 1" wide and include minor brecciation of the walls.

(Cont'd)

9-3-84 (Mon.) Paiute Hole [redacted] 4

114.1 — ?

- At 156.3' to ; ~~Mod.~~ wk becoming moderate vuggy white and lt gray, granular Qtz + pyrite stockwork veins. Minor thin Qtz + hematite + pyrite veinlets. ≈1% dissem py in veins & rock. Some olive-green clay veins too. to 163'

(Notes continued later →)

9-4-84

Shut down Hole 4 [redacted] at 266' @ 4 A.M. 9-4-84

Start drilling Hole 6 [redacted] at 8 A.M. on Tuesday 9-4-84.

Hole 6 [redacted] is 164°, -26°

9-4-84 Tues. Paiute Hole [redacted] 6

164°; -26°

	RECOVERIES	
0 – 13'	[redacted] 13'	None
13 – 16'	[redacted] 3'	90%
16 – 22'	6'	93%
22 – 26½'	4½'	93%
26½ – 35½'	9'	94%
35½ – 45½'	10'	98%
45½ – 55½'	10'	100%
55½ – 64'	8½'	94%
64 – 67'	[redacted] 3'	100%
67 – 73½'	6½'	89%
73½ – 78½'	5'	100%
78½ – 84'	5½'	78%
84 – 90'	6'	83%
90 – 95½'	5½'	91%
95½ – 105½'	10'	98%
105½ – 111½	6'	97%
111½ – 118'	6½'	89%
118 – 123'	5'	98%
123 – 127'	4'	73%
127 – 136'	9'	94%
136 – 143'	7'	100%
143 – 153'	10'	100%
153 – 163'	10'	88%
163 – 173'	10'	55%
173 – 183'	10'	62%
183 – 189'	6' [redacted]	40%
189 – 193'	4'	75%
193 – 201'	8'	80%
201 – 205'	4'	100%
205 – 207'	2'	100%
207 – 215'	8'	98%

TD.

9-4-84 (Tues.) Paiute Hole [redacted] 6

0 – 13.0' lost core when casing hole

13.0 – 21.3'

Lt gray strongly argillized lithic tuff with streaks and blebs of dk gray and pale green massive [redacted] clay replacing the lithic clasts. Rock looks slightly sheared, the clay blebs are very elongate in shape. Some wk propylitic alt'n assoc. w/ clay, no pyrite. Minor limonite on fracts. Matrix of tuff gradually changing to lt greenish-gray at about 15'. Minor MnO_2 as coating and in dendrites on fracture faces.

21.3 – [redacted]'

Same as 13-21.3 except increased shearing, very strong. Big increase in clay content filling shears. Lost some recovery here around 22.0'

- At 22.8' to 25.0' the rock still str. shearing, color becoming a pale soapy bluish-green; propylitization becoming moderate to strong. No pyrite here.
- At 25.0' to 26.1' there are now irregular patches of silicification with a lt gray color. Wk. limon on fracts. Wk. Qtz veining + silicif. patches begin at 25.8' to 26.1'
- At 26.1 to 28.0' Massive textureless lt. gray clay.

(Cont'd)

21.3 —

— At 28.0' to 30.4' back into med. bluish-green, strongly propylitized str. argilliz., sheared, strongly, rock with patchy silicifeation and ~~wk~~ mod. Qtz veining w/ limonite stain on it. Much repeated shearing demonstrated in silica flooded areas.

— At 30.4' to 32.6' very strong shearing, ~~highly clay content~~ lt gray color. Mod. quartz veining. Friable rock because it is so intensely fract'd. No green propylitic minerals. Rock looks bleached.

— At 32.6' to 37.5' back into rock exactly like that between 28.0' and 30.4' with same color and intensity of alt'n and wk Qtz veining. Shear zone. Only diferenca is that there is now trace dissem fine pyrite. Minor Jarosite on fractures too.

— At 37.5' to 38.6' Rock is lt greenish-gray, wkly propyl., str. sheared, mod. Qtz stockwk veined str. argillized lithic tuff. With Clay + limon + hematite filling major fractures. Silica flooding varies from wk to strong. Trace Py. cubes

— At 38.6' to color change Sharp to bright bluish-green, str. propylitiz'n, tr pyrite. Qtz veins become very vuggy white Gradually becomes mod. argill w/ depth

21.3 —

to dk gray in color. Heavy clay + limon on fracts. throughout

At 38.9' veining becomes wk but still wk stockwork. (< 10% of rock.)

At 42.6' Qtz veining becomes mod. and size of veins increase up to 5/8" thick. Good stockwk. . Tr. pyrite cubes. to 45.1'

At 45.1' to 47.3' Qtz veining becomes wk.

At 47.3' to 47.9' Qtz veining moderate

At 47.9' to 48.8' Qtz veining wk.

At 48.8' to 49.7' Mod. Qtz veining.

At 49.7' to 52.4' Wk Qtz veining.

There was a dk green and white Qtz vein. Dk green minerals softer than knife. at 51.1'. No stkwk, veins all parallel

At 52.4' to 59.2' Mod. Qtz veining. very vuggy, white, stkwk. At 54.6' Rock the same but really sheared-up + FeOx Despite the veining in the rock, it is very competant stuff with only wk breaking until you get to 54.6'.

At 59.2' to 61.9' Wk non-stkwk Qtz veins, but some are up to 1" thick

At 61.9' to 62.5' Mod. Qtz + limon. stockwork w/ vugs. Bleached tan next to veins

At 62.5' to 64.4' Wk Qtz veining up to ½" wide mostly non-stkwk but locally wk stockwork. It has been a gradual change but propylitiz. has been decreasing somewhat ~~and the color has lessened from bright bluish-~~ color has lessened from bright bluish-

21.3 –

green to medium greenish-gray.

– At 64.4' to 66.7' Mod. Qtz + limonite stockwk veining. Str. silica flooding associated. ~~Evidence of~~ Strong brecciation recorded in the silicified zones. Qtz veins vary from hairline up to 5/8" and vuggy locally.

– At 66.7' to 67.8' Back to mod. argill. lithic tuff w/ wk Qtz veining but dissem pyrite is 1-3% fine, cubic, becoming 5-7% where the black clays fill the fractures and permeate the rock.

– At 67.8' to 69.1' Same rock w/ wk non-stkwk Qtz veins but Py is only minor now.

– At 69.1' to 70.9' med. greenish-gray zone of brecciation, strong silicification, and strong Qtz stkwk veining (>25% of rock!). Tr. Pyrite. Mod. propylitiz'n. Great Stuff. Qtz is vuggy. Mod. limon on fracts.

– At 70.9' to 72.2' [redacted]. argill. str., grayish-green, bleached, non-pyritic lithic tuff w/ faint text. Gray-white clay fract fills wk. Wk. hairline non-stkwk Qtz veins. wkly silicified patch w/ strong fract'g @ 72.2'.

– At 72.2' to 79.4' the rock remains the same, but we are

(Cont'd)

21.3 –

entering a shear zone w/ limonite (wk) on fracture faces. Trace Pyrite dissem. Mod. propylitiz'n.

– At 78.0' color becomes bleached to lt. gray. ~~massive clays, strongly argillized rock w/ limon on fracts.~~

– At 79.4' to 80.2' Rock becomes gray, str. fractured, mod. limon stained, str. silicified, wkly Qtz veined. lithic tuff w/ faint text. No pyrite.

– At 80.2' to 82.1' Sheared gray clay and str. argillized lithic tuff Shear forms high angle contact.

– At 82.1' to 85.7' Sharp contact into unsheared, str. argillized, med. greenish-gray lithic tuff. Non-pyritic, mod. propylitic minerals.

– At 85.7' to 87.5' Sharp contact into same rock except mod. to strongly with depth sheared zone.

– At 87.5' to 91.5' same as 82.1' to 85.7' unsheared. Trace fine dissem. Py cubes.

A 3/8" thick qtz vein with gray colored silica flooding along borders 1" wide cutting core at < → ▯ of ≈45°

At. 89.5'. 3/8" Qtz vein, gray @ 91.0'

– At 91.5' to 93.7' Rock is the same but fracturing is now moderate with mod. goethite & limonite on faces. Minor fine cubic dissem. Pyrite.

(Cont'd)

21.3 —

— At 93.7' to 96.3' Rock looks weathered lt. greenish-gray massive clay with heavy to moderate pervasive limonite staining and dk brown-black MnO_2 (?) or goethite (?) staining. I think this hole must be approaching the surface. It sure looks like weathered rock! Locally though, the rock is less weather'd and looks like 82.1' to 85.7'.

— At 96.3' to 97.5' Same as ~~[redacted]~~ ~~[redacted]~~ 82.1' to 85.7' except there are wk limonite + clay fract fillings.

— At 97.5' to 98.3' Same rock but with some shearing and mod. pervasive limonite and goethite and possibly MnO_2?

— At 98.3' to 99.0' Sharp contact of shear zone into mod. argillized ~~to wkly~~ ~~argill~~ lithic tuff with well preserved texture. Med. gray in color, unbleached ~~wk limonite filled fracturing and clay filled fractures~~

— At 99.0' to 103.0' Color becomes bleached gradually to lt. greenish-gray wk limonite filled fractures and clay filled fractures. Mod. to str. argilled and wk to mod. propylitized. Degree of fracturing and amount of limonite & goethite on fractures increases to mod. with depth.

— At 103.0' to 104.5' Same rock but with w/ Qtz stockwk veining, vuggy, white, w/ drusy Qtz lining vugs.

9-4-84 (Tues) Paiute Hole [redacted] 6

21.3 —

Veins assoc. w/ some silicification on their borders.

— At 104.5' to 110.5' Rock is same as 99.0 – 103.0' except slightly less bleached. Trace fine pyrite cubes, disseminated. Single 3/8" thick gray irregular Qtz vein @ 109.0'. Pyrite disappears at 110.0'

— At 110.5' to 112.3' A color change across ~~[redacted]~~ from gray through lavender to ~~pur~~ grayish-purple lithic tuff. Texture much more distinct. Decrease in argillization to moderate. Incr. in hematite content in tuff matrix. No pyrite, ~~[redacted]~~ no propylitization. Trace limonite on fractures.

— At 112.3' to 118.0' rock becomes bleached gradually across 6" to ~~gray~~ light gray color. Wk ~~[redacted]~~ Stkwk Qtz veins w/ assoc. silicif. on borders. and much gray to green clay assoc. with the veins. Veins are 75% Clay 25% Qtz. (Weak mineralization here). From 112.3' to 118.0' the rock is mod. to strongly argillized and volc. texture is faint.

A wk Qtz + clay ± hematite veinlets, non-stockwk, @ 117.0'

— At 118.0' to 119.1' there's a sharp change to grayish-purple lithic tuff. A single 1/8" Qtz vein at 118.7'.

9-4-84 (Tues) Paiute Hole [redacted] 6

21.3 —

Minor limon & mod. goethite on fract faces. Wk fract'd.
At 119.1' to 121.3' back to bleached gray strong argillized lithic tuff w/ faint texture.
Wk. Qtz veining with minor brecciation. Mostly Clay + Qtz veins.
Pink alunite (?) replacing the lithic tuff? at 121.3'.
Pervasive weak limonite - stain on and near fractures.
At 121.3' to 128.8' Only clay fract. fillings, wk fracturing w/ limon on faces. Gradually decreasing argillization, becoming moderate, with well-preserved lithic tuff texture. Wk Qtz veinlets at 127.8' mixed w/ clay and limonite, and also
Mod qtz 128.8'. to 131.3' with accompanying silica flooding and brecciat'n.
At 131.3' to 135.1' Same as 128.8 to 131.3' exept Qtz veining has become weak. There is little or no brecc'n or silica flooding adjacent to the veins. Wk limon. & mod. goethite coating fracts. 5% pyrite along fracture faces coated with clay and green minerals like chlorite + epidote?
1-2% fine cubes of dissem. pyrite, but decrease to minor at 133.7'.
(Cont'd)

9-5-84 (Wed) Paiute Hole 6

21.3 —

At 135.1' to 136.8' Mod. Qtz stockwork veining, 1-2% dissem. cubic pyrite. [redacted] wk. brecciation, minor silica flooding on borders of veins. Milky lt. to med. gray Qtz veins, chalcedonic - looking rather than granular.
At 136.8' to 137.8' Bakk to wk Qtz veining forming wk stockwk. chalcedonic Qtz. Minor Py
At 137.8 to 138.4' Mod. Qtz stkwk veining. At 138.4' to wk Qtz stockwk veining, minor amount of the Qtz is limonite - stained, vuggy, with cox comb texture. Minor Py.
Veining becomes noticeably weaker at 140.5'. At 143.8' to Qtz stkwk veining is moderate. There is good brecciation and minor silica flooding assoc. with the veins. Minor Py. Some veins are Qtz + Pyrite veins.

9-18-84 Paiute Hole #1

Additional structural data.

at ~~303.6'~~ Qtz + hematite + clay + py vein 45°

at ~~304.5'~~ Qtz + hematite + clay + py vein 30°

at ~~309.5'~~ foliation of welding in the tuff at 70°

at 316.0' Qtz + clay + py veins all are 55°, 40°, 25°.

at 321.1' foliation of welding in the tuff at 55°

at 323.5' Qtz + hem + clay + py vein 50°

at 330.8' Qtz + hem + clay veinlet thin 40°

at 333.0' foliation of welding in the tuff at 55°.

9-18-84 Paiute Hole no. 2

Recoveries

Interval	ft total	% rec'd
0 – 10'	10'	None
10 – 16'	6'	93%
16 – 26'	10'	95%
26 – 36'	10'	70%
36 – 46'	10'	91%
46 – 52'	6'	90%
52 – 62'	10'	92%
62 – 72'	10'	89%
72 – 81'	9'	100%
81 – 85'	4'	93%
85 – 90½'	5½'	96%
90½ – 96'	5½'	100
96 – 106'	10'	98
106 – 116'	10'	98
116 – 126'	10'	89
126 – 134	8'	89
134 – 139'	5'	92
139 – 145'	6'	95
145 – 148½'	3½'	94
148½ – 158'	9½'	98
158 – 167'	9'	100
167 – 171'	4'	100
171 – 176'	5'	99
176 – 186'	10'	100
186 – 196'	10'	87
196 – 204'	8'	100
204 – 214'	10'	100
214 – 216'	2'	100
216 – 226'	10'	99

9-18-84 Paiute Hole no. 2

30.2 – 31.5' Sharp contact into cream-colored, strongly bleached and argillized tuff with only very faint volcanic texture preserved. Mod. yellow-brown limonite-staining on fractures oriented 10° to axis of core. Grades into reddish-brown wkly argillized coarsely lithic welded tuff at 31.1' – 31.5'.

31.5 – 35.2' Same as 24-28' with yellowish FeOx-stained flattened pumice fragments that have turned to clay. Foliation of the welding in the tuff oriented 65° to core axis. Sharp contact with another welded tuff unit of a slightly lighter color. Grain-size and amount of lithic frags decreases right at the contact. 70°.

35.2 – 60.2' Basically the same as 24-28' except it is a different tuff unit, but the same in appearance. Foliation of welding in the tuff is 70° to the core axis. Wkly propylitized, wkly argillized, wkly fractured with wk to mod. limonite staining on fracts just like 31-35'. There is a greater abundance of silicified and sometimes pyritized lithic clasts in this tuff unit. Maybe reworked from prev. silicif'd rock. Qtz + hematite fract. filling 1/32" thick 30° to core axis at 40.8'.
At 42' foliation of welding still 70°.
At 45.0' there is a large limonite + clay

(Cont'd)

9-19-84 Paiute Hole no. 2

35.2 – 60.2'
filled fracture a 5° angle to the core axis.
At 46.5' foliation of welding is 65°.
At 52.0' fracturing still weak but it parallels the core axis for 3 ft, making it appear that fracturing increases.
At 56.6' tiny, granular, sugary Qtz veinlet 25° to core axis. The rock remains the same except for increased bleaching which gives the rock a slightly lighter shade of reddish-brown.
At 58.5' to 59.1' A calcite ± limonite vein up to 1/8" thick, 30° to core axis, and some smaller parallel veins.

60.2 – 61.3' Lt. greenish-gray, bleached, wkly to mod. propylitized, wkly to mod. argillized welded coarsely lithic tuff. Trace granular clear to white Qtz veinlets (25°). Foliation of welding 75° to core axis. No pyrite.

61.3 – 62.7' there is a 1/8" thick calcite veinlet in a fracture w/ limonite, 45° to core axis. Color gradually becoming a medium grayish-green. Mod. to strong propylitic alteration. Fracturing still weak, with limonite staining assoc. Mod. argillized.

62.7 – 65.7' Same as before except with wk. thin calcite vnlts. 30°, & 40°.

9-20-84

Paiute Geochem.

got results from Hunter Lab on the following samples.

	AU oz/t	AG oz/t
84300PR	.001	.05
301	—	.15
302	—	.06
303	—	.09
304	—	.10
305	—	.08
306	.001	.20
307	.001	.15
308	—	.09
309	—	.13
310	.001	.09
311	—	.11

9-20-84 Paiute Hole #2

65.7 — 68.3'

Same as 61.3 – 62.7 without any calcite veinlets. Foliation of welding in the tuff is 75° to the core axis. There is a small FeOx-stained patch of silicification at 65.7'. The limonite staining on fractures becomes moderate, fract'g bec. mod.

68.3 — 70.3'

Color changes to bright bluish-green with only wk limonite and goethite on fractures. No pyrite. Argillization becomes strong now, with the volcanic texture becoming faint. Rock is taking on a sheared appearance. There are small lt. gray bleached patches that show wk silicification.

70.3 — 72.0'

Same as 68.3 to 70.3' except for wk pervasive limonite staining throughout giving the core a greenish-brown color of moderate hue. MnO_2 dendrites on fracture faces.

~~Small discontinuous calcite fract. filling at 72.3', 20° to core axis.~~

72.0 — 74.3'

Same as 70.3 – 72.0 except the pervasive limonite stain is gone and the core is med. grayish-

(Cont'd)

9-20-84 Paiute Hole #2

72.0 — 74.3'

green. A small discontinuous calcite veinlet occurs at 72.3', 20° to core axis, another at 72.7', & 73.4', 35° to the core axis. Sheared appearance continues to 74.3'. Contact is 10° to axis.

74.3 — 79.0'

The same strongly argillized, mod. propylitized, non-pyritic, lithic welded tuff; Med. grayish-green in color with dk. green propylitic minerals replacing flattened pumice(?) fragments. Wk. limonite-staining on fractures. No shearing though. Weak fracturing.

Tiny calcite veinlet, 35° to core axis, at 77.1'

79.0 — 84.8'

Same as 74.3-79.0' except the color now is bright bluish-green and the core has the appearance of a shear zone, fracturing increases to moderate and limonite stains the fractures. Minor white clay fracts fills

84.8 — 86.5'

Sharp contact into the same rock type, but unsheared. The contact is 80° to core axis. The foliation of the welding is 70° to the core axis but dips in the opposite direction of the contact. Must be a fairly low-angle shear. Sharp contact into sheared zone.

9-20-84 Paiute Hole #2

86.5 — 92.3'

Rock is same as 72.0 to 84'. Contact into shear zone is 70° to core axis but cuts foliation of welding at an angle. There is a sharp contact with unsheared rock that is 20° to core axis. This contact begins at 92.3' and extends downward a foot or so.

The color of the core is bright bluish-green last 86.5' but gradually bleaches to lt. grayish-green at end of zone. Clay on fracts.

92.3 — 97.2'

Sharp 20° contact into bright bluish-green strongly propylitic, str. argillized welded lithic tuff with dk. gray str. silicified lithic fragments in it. Sharp contact into shear zone of same rock type. The contact is low-angle and parallels the foliation of the welding, 70° to the core axis.

97.2' — 97.5'

Sharp contact into shear zone. Same as 79-84'.

97.5 — 103.0'

Back into strongly argill, mod. propylitized welded lithic tuff; less propylitic and more bleached looking lt. greenish-gray color.

At 100.5' there is a brownish & olive green seam 2" thick, 70° to core axis and parallel to foliation

(Cont'd) →

9-21-84 Paiute Hole #2

97.5 – 103.0'

on welding in tuff. The seam has sharp irregular borders and is made of a mixture of banded and massive clay mixed with minor silica or ~~[illegible]~~ adularia(?) and has a ~~replacem~~ texture typical of replacement rather than open space filling.

Fracturing has become weak again.

Another pinkish-brown patch of (alunite?) clay replacing the tuff at 101.1'.

103.0 – 116.6'

Color change to a medium grayish-green color. Increased propylitization. Gradational change.

At 105.5' Rock is same but fract'g becomes moderate with trace limonite.

A clay-filled fracture at 114.4' trends 30° to core axis. The welding foliation there is 60° to the core axis

116.6 – 118.2'

Color change to lt. greenish-gray bleached-out welded lithic tuff with patches of wk to mod. silicif. Also fracturing still moderate and there is wk to mod. limonite and goethite on fracture faces. The rock is cut by tiny sub-parallel

9-24-84 Paiute Hole #2

~~118.8 – 126.9'~~ 116.6 – 118.2

chalcedonic-looking Qtz veinlets that do not form a stockwork and are parallel to the axis of the core. No pyrite assoc.

Volcanic texture in rock is less distinct than before. Rock is strongly argillized, mod. propylitized.

The Qtz veining forms only a small percentage of the rock so I would consider it weak.

~~At 118~~

118.2 – 126.9'

Entering shear zone of mostly lt. mint-green clay with brownish chunks of silicified tuff incorp-orated into it. No Qtz veining or pyrite here though. We're gettin' close to the ore zone now...

At 120.8' the color becomes medium green, propylitization has become strong, but there is still no pyrite. Still some patches of chalcedonic silica flooding.

From 122.2 – 122.8' there is a "horse" of unsheared but altered tuff.

126.9 – 132.2'

This is basically the same shear zone material except there is now the appearance of pink-tinted veins up to ¼" across consisting of sheeted cryptocrystalline chalcedonic looking well-fractured Qtz. Open space filling.

9-24-84 Paiute Hole #2

126.9 – 132.2'

Veins at 35° to core axis.
Veining is considered weak here (<10% of rock). Trace dissem. py

132.2 – 138.9'

Irregular, ragged contact into strongly silica flooded tuff cut by strong Qtz stockwork veining. (>25% Qtz veins in rock. Breccia filling too. At 133.0' to 134.0' back into rock like 126.9-132.2'.
(minor Py)

At 134.0' the rock is the same as 132-133', then back into the gouge zone like 126-132'
lt. gray in color, but darker where silicifd.

138.9 – 157.4'

Sharp contact from shear zone into lt. brownish-gray, bleached, wkly propylitized, wkly qtz+Py veined welded lithic tuff. Wk pyrite, disseminated.
A qtz vein occurs at the contact, which trends 23° to core axis. Tr. calcite veinlets.
The Qtz in the veins is white, vuggy and banded but not granular, more cryptocrystalline, exhibits brecciation.
The veins form a wk stockwork and most of the Pyrite occurs at the outermost edge of the Qtz veins. Wk limonite staining in the Qtz veins. Some tiny Qtz veins w/ granular Qtz.
At 141.8' there is a gray cryptocrystalline Qtz+py+hematite vein 1/2" thick.
There are a small # of white clay + limonite filled fractures closely

9-24-84 Paiute Hole #2

138.9 – 157.4'

assoc. w/ the Qtz veins (parallel)
At 142.7' the Qtz veining becomes moderate. Areas of silica flooding bordering some of the veins are darker gray in color and locally heavily pyritic.
At 143.4' the Qtz veining becomes weak again but still forms wk stkwk.
At 147.5' the small Qtz+py+limonite vein trends 20° to core axis
Wk stk wk to 144.5' then the veins fill fractures but don't form a stockwk. The veins generally trend 20°-30° to core axis.
Still less than 1% dissem. framboidal but cubic pyrite
At 150.7' to 151.8' wk. Qtz stockwork veining, Qtz+limon+Py veins up to 1/8" Minor tiny Qtz+hematite veinlets
At 151.8 to 153.6' Wk non-stockwork Qtz+limonite veinlets.
At 153.6 to 154.2' Wk stockwk Qtz+hematite veinlets.
At 152.7' onward dissem. pyrite in euhedral cubes up to 2% of rock, until 155.8', then back to minor.
For the most part this entire section from 138.9' onward is wkly fractured with various orientations of the fractures, but occasionally are oriented 20°

9-24-84 Paiute Hole #2

138.9 — 157.4'

to core axis, the same as many of the sheeted ~~[illegible]~~ granular Qtz + FeOx veinlets.

At 155.8' the foliation of the welding in the tuff is 70° to the core axis.

157.4 — 158.8'

Sharp contact into shear zone with heavy limonite + clay filling the large fractures. No Qtz veining recognized here.

158.8 — 188.5'

Med. gray, slightly bleached, ~~[illegible]~~ trace pyritic, mod. to strongly argillized welded lithic tuff. Pumice(?) or lithic fragments are propylitized into lt. green clay + chlorite (?).

Volcanic texture slightly more defined than before?

A thin Qtz + hematite veinlet trending 35° to core axis occurs at 162.0'

At 163.5' a 1/16" thick Qtz + limonite + Pyrite vein trends 30° to core axis.

@ 164.9' There is a yellow-cream-colored clay + fract. filling trending 18° to core axis, 1/16" thick.

At 165.7' There is a thin Hematite + clay + Adularia + pyrite vein trending 20° to core axis.

At 170.7' to 171.0' there is a 3" wide shear zone.

From 164.9' to 177.9' there is wk.

9-25-84 Paiute Hole #2

158.8 — 188.5'

clay or clay + pyrite fracture fillings that are not a stockwork

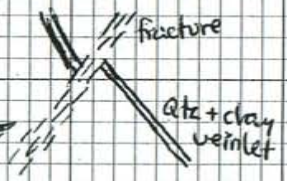
At 175.2' to 177.9' there is a single 1/2" thick Qtz + clay + adularia vein with smaller offshoots that in general trends 5° to the core axis. The vein has a somewhat braided appearance. Limonite-stain'd too.

Beyond 177.9' there are only a trace number of those yellowish clay fracture fillings. These sometimes will be hematite or limonite stained.

At 181.7' there is a hairline gray chalcedonic cryptoXtline Qtz vein that trends 80° to core axis.

At 183.5' the foliation of the welding in the tuff trends 70° to core axis.

At 184.0' →



A banded Qtz + clay + limonite veinlet 1/16" thick trending 25° is cut by a fracture and offset 5 mm ~~[illegible]~~

The fract. trends 35° and their strikes are roughly similar.

From 184.0' to 185.0' there is a number of small clay filled fractures which parallel the core axis thus making it appear that there is more fracturing than actual.

(Cont'd) →

9-26-84 Paiute Hole #2
158.8' – 188.5' (Cont'd)

At 185.8' to 186.2' there is a narrow shear zone filled with gouge clay that trends 10° to the core axis and at one spot consists of half of the volume of the core. Up to 1% dissem. but coarse clumps of (framboidal?) pyrite that is subhedral to euhedral but is very soft and crushed looking.
At 186.2 – 188.5' Same rock as before with minor clay fracture fillings and minor disseminated pyrite.

~~At 188.5 to~~
~~The rock contains 1% disseminated pyrite.~~

188.5 – 191.1' Lt. gray with pale green propylitized flattened pumice fragments. Rock is wkly silicified locally; Mod. argillized, wkly propylitized, wkly pyritized welded lithic tuff. Carries ½ to 1% dissem pyrite and minor non-stockwork clay fracture fillings.
At 189.5' there is a Green clay + pyrite + Qtz fracture filling trending 20° to core axis.
From 189.5' to 191.1'
there are hairline Qtz veins made of granular, clear to white Qtz and possibly some adularia too. (has cleavage). There are scattered

9-26-84 Paiute Hole #2

188.5 – 191.1'
Small patches of med. gray to dk gray silicification that is usually accompanied by a fine dusting of pyrite.

191.1 – 191.4'
Contact sharp (40°) into a narrow shear zone, that contains 1-2% disseminated pyrite cubes.
Sharp contact out of this zone (60°) sub-parallel to foliation of welding.

191.4 – 194.1'
Rock is same lt. gray altered tuff with wk hairline Qtz veins.
Rock here does contain ≈ 2% dissem fine pyrite though. There is an increase in the numbers of silicified patches in the rock.
The Qtz veins form a weak stockwk. Many of the veins trend 80-90° to the core axis, but not all.
At 194.1' the intensity of the stockwork is increasing, the size of the veinlets increasing up to ⅛" thick. Sharp contact here. (20°)

194.1 – 196.0'
Suddenly entered a silicified breccia zone. Brecciated Qtz + hematite + Pyrite + adularia veins Red in color that have been brecciated. The surrounding rock is dk gray in color and

194.1 — 196.0'
has been strongly silica-flooded. What probably was pre-existing yellowish-brown clay gouge has now been silicified. The wall rock next to the zone has been bleached, mod. argillized, and carries ≈ 2-3% pyrite in coarse clumps. Sharp contact out of the zone at 196' (30°).
Strongly Qtz veined > 25% of rock.

196.0 — 198.1'
Sharp contact into strongly pyritized (>5%) darker gray, wkly to mod. silicified welded lithic tuff that appeared to be argillized before silicified. because volc texture partially destroyed. Only a trace amount of propylitic minerals replacing the argillized flattened pumice fragments in the tuff. ~~Sharp 10° contact back into lt gray altered tuff similar to 191-194' with some fine-grained chalcedonic Qtz veins oriented 10°~~

198.1 — 209.7'
Sharp 10° contact back into lt. gray altered tuff similar to 191-194' with some fine-grained chalcedonic Qtz veins oriented 10° and hairline-size up to 1/8" thick. Some of the smaller veins are granular, clear to white Qtz.
At 199.3' there is a silicified

198.1 — 203.7'
patch where the matrix of the tuff is dk gray and contains 5% pyrite as a very fine dusting. This silicif. zone oriented 80° to core axis, sub-parallel to foliation of welding.
These patches are irregular in outline and gradational in their boundaries in this area the silica-flooded patches probably make-up 10% of the rock maybe 15%.
Outside of the silica-flooded zones, the rock carries only minor disseminated pyrite.
Past 201.7' the Qtz veining becomes very thin and infrequent, non-stockwork veinlets Qtz or Qtz + pyrite + hematite.

203.7 — 225.8'
Lt. gray mod. argill, wkly pyritic, trace propylitic welded lithic tuff. Trace pyrite
No more Qtz veins or silica-flooded patches. There are occasional clay + pyrite + limonite and/or greenish-gray or gray clay veinlets occasionaly but very wk and non-stockwork, oriented about 10° to core axis.
At 204.5', a tiny purple Qtz + clay + hematite veinlet trending 30°. And another one at 205.1'

(Cont'd) →

9-26-84 Paiute Hole #2

203.7 – 225.8'

At 207.3' Hairline Qtz veinlets forming a weak stockwork. Very localized.

At 208.3 to 208.8' There are Qtz + pyrite veinlets oriented 10° and 70° to core axis (Not parallel strike to tuff foliation)

At 210.3' to 210.9'
Qtz + pyrite + clay veinlet 35° to core axis. More clay than Qtz in the veins

At 214.4' there is a Qtz + clay veinlet with some bluish-green massive clay in it, Oriented 30°, and an 80° oriented pyrite-filled fracture.

At 217.7' there is a ~~clay + limon~~ yellowish clay fract filling oriented 30°.

At 219.7' Qtz + pyrite + clay vein, 1/8" thick, very vuggy, 30° trend

At 219.7 to 220.5' there are a couple of clay + pyrite + Qtz veinlets 1/32" thick and fairly insignificant.

At 222.1' there is a 1/16" clay + pyrite veinlet oriented 30° to core axis.

★ From 221.1' to 225.8' There is an slight increase in green minerals. wk propylitization now instead of trace.

At 225.8' thin Qtz + pyrite veinlet oriented 30°.

9-26-84 Paiute Hole #2

Recoveries

Interval	ft total	% rec'd.
226 – 236	10'	100%
236 – 242	6'	100%
242 – 246	4'	100%
246 – 255	9'	97%
255 – 265	10'	100%
265 – 275	10'	100%
275 – 285	10'	100%
285 – 287	2'	100%
287 – 292	5'	100%
292 – 302	10'	100%
302 – 312	10'	83%
312 – 316	4'	100%
316 – 326	10'	67%
326 – 336	10'	100%
336 – 346	10'	100%
346 – 356	10'	98%
356 – 366	10'	100%
366 – 375	9'	96%
375 – 380	5'	78%

9-26-84 Paiute Hole #2

225.8' — 226.6'
The rock is the same as that from 203–225' with wk propylitic alteration and wk. stockwork Qtz + pyrite veining with some areas of silica-flooding locally along the vein borders. The veins are < 1/16" wide.

226.6 — 241.5'
The rock is the same as 203-225' without Qtz veins, silicification. Only trace pyrite disseminated.
At 231.7' there is a tiny dk gray Qtz + pyrite veinlet oriented 40° to core axis.
At. 232.3' to 232.7' there is a shear gouge clay zone 10° to core axis
At 232.7 to 233.0' there is a zone of dk gray, massive, silica-flooding which has no visible pyrite.
At 235', fracturing oriented 5° to core axis.
At 240.2' there is a 40° oriented tiny Qtz + pyrite veinlet 1/32" thick.
At 239.2 to 239.4' A dark gray strongly silica-flooded patch with no visible pyrite
At 240.0' there is a gradual change in the color of the core to medium gray.

9-26-84 Paiute Hole no. 2

241.5 — 242.0'
At 241.5 – 242.0' there is wk Qtz stockwork veining, then a sharp contact.

242.0 — 243.5'
Contact oriented 40° into a shear zone with a strong network of clay fracture fillings then a strong contact out of the zone oriented 20°. Trace euhedral pyrite xtls in zone.

243.5 — 244.0'
narrow zone of med. gray, unsheared, mod. argillized, wkly propylitized, trace pyritized welded lithic tuff with minor thin dk gray Qtz veinlets non-stockwork. There's a couple of small silica-flooded patches too.

244.0 — 253.5'
Same rock as 243-244' except there is weak clay fracture fillings, wk. fracturing, most at a low angle to the core axis.
At 248.9' there are no more clay fracture fillings. Fracturing 10° to 30° to core axis is real weak; the rock is the same.
At 253.0' there is a tiny Clay + Qtz + pyrite veinlet 1/32" oriented 10°.

253.5 — 266.9'

Fairly sharp but gradational contact over a few inches into fresh unaltered welded lithic tuff with unaltered biotite flakes in it. No fracturing in this zone, very tight rock. No visible pyrite; volcanic texture very clear; rock is a darker gray color. There is some evidence of wk propylitic alteration (but this could be a regional alter-ation).

At 257.1' there is a hairline width pyrite-filled fracture oriented 25° to core axis.

At 263.4' the color of the core is becoming slightly lighter; the biotite is not fresh but wkly altered; there is some evidence of very mild bleaching and weak argillization.

At 266.0' there is a 1/32" thick Qtz + clay veinlet oriented 2[redacted].

[redacted] the vein can be seen until 266.8'

266.9 — 268.9'

that veinlet continues into this zone, which is a medium greenish gray wkly argillized, wkly propyl-itized welded lithic tuff.

Gradat. contact into fresh unaltered tuff.

268.9 — 275.7'

Fresh, dk gray, unaltered welded lithic tuff. Foliation trends 70-75° (welding).

Fresh biotite flakes.

Wk non-stockwork Pyrite > Qtz veinlets mostly 5° to 20° to core axis.

275.7 — 280.5'

Gradational contact into med. gray wkly argillized lithic tuff same as 266-268'.

No visible pyrite

280.5 — 284.0'

Same rock as 275-280' except there is now wk. thin Qtz + Py veinlets randomly oriented.

284.0 — 289.2'

Entered a sheared zone with weak[redacted] clay-filled fractures.

No pyrite here either.

Argillization increases to moderate

At 287.0 — 288.3' there is a horse of unsheared rock here then the shearing gets stronger than before. Volcanic texture completely obscured now, clay content is high.

Sharp 40° at bottom end.

289.2 — [redacted] 336.0'

Med gray, mod argillized, wkly pyritized welded lithic tuff. No propylitization.

< 1% dissem. pyrite.

(Cont'd) →

9-28-84 Paiute Hole no. 2

289.2 – [redacted] 336.0'

At 290.4' there is a 40° trending gray, granular qtz veinlet 1/8" thick with a thick sheath of silica-flooding along the border.

At 292.8 to 293.7' there is a Qtz + limonite vein made of massive white bull Qtz oriented ≈ 10°.

At 302.6' there are a moderate number of clay filled fractures of various orientations.

At 303.5' there is a Qtz + py veinlet 1/8" thick oriented 15° to the core axis

At 307.6' there is a Pyrite-fracture filling oriented 70° to core axis, and minor clay + Py on fractures to [redacted] ~~where a shear zone is entered~~ 336.0'

[redacted] At 313.7' there is a small Qtz + clay + pyrite veinlet.

At 316.3' there is 1/2" thick Gray & white colloform qtz vein with several episodes of mineraliz'n represented. The Qtz is massive, cryptocrystalline. Minor silicif. of walls on vein borders.

At 328.7' there is an 80° trending tiny red Qtz + hematite + pyrite veinlet.

wk clay or clay + hem + py or clay + py fracture fillings ranging from 5° to 15° to core axis, basically from 302.6' onward.

At 336.0' enter a weakly

10-2-84 Paiute Hole no. 2

[redacted] – 289.2 – 336.0'

sheared zone with a 15°, sharp contact.

336.0 – 337.4'

Sharp 15° contact into weakly sheared rock with a weak to locally moderate density of clay filled fractures. Rock is identical in composition and alteration to that of 289-336'. Sharp 40° contact out of this zone.

337.4 – ~~380.0~~' 368.8'

Same as rock from 289-336 except this is tight rock; no fracturing. This zone is also characterized by stratabound layers or zones of dk gray silicification up to 4" thick oriented at 70-75° to core axis, parallel to foliation of the welding in the tuff. No visible increase in Py content in silic'd zones.

Only trace dissem. py in the core.

At 343.0 to onward there are several small yellowish or dk gray clay and clay + pyrite fract. fillings that are subparallel to core axis. Throughout this zone there is a faint hint of propylitiz'n in the argillized lithic clasts in the tuff. (wk propylitiz'n).

10-2-84 Paiute Hole no. 2

337.4 — ~~380.0~~ 368.8'

At 368.8' to 374.0' there is another sheared zone
The contact is sharp and ≈ 20° to core axis entering the shear zone and sharp ≈ 35° leaving it.

At 374.0 to 380.0' there is weak to mod. fracturing otherwise rock the same as before, except unsheared here.

END of HOLE #2.

10-2-84 Paiute Hole no. 4

Previously logged to 163'

156.3 — 163.1'
Med. gray, bleached lithic tuff. Wk becoming moderate, vuggy white and light gray, granular Qtz + pyrite ± barite stockwork veins. Minor thin Qtz + hematite + Py veinlets; ≈ 1% dissem. pyrite in veins & wall rock. Some olive-green clay veinlets occur too.

163.1 — 165.4'
Shear zone. Med. gray clayey gouge with chunks of massive chalcedonic cryptocrystalline Qtz in it.
The contacts of the shear zone are not preserved in the core but are assumed to be sharp.

165.4 — 166.1'
Breccia - Silica Flooded Zone.
Dk gray, strongly silicified, mod. Qtz veined. 1% fine dissem. pyrite

166.1 — 178.1'
40° sharp contact into Dk greenish-gray ~~altered~~ mod. silicified, 1% dissem. pyrite. wk. Qtz veining, rather thin, forming wk stockwk. Volcanic texture poorly preserved
There are numerous tan vug fillings and crystals of barite lining vugs. Drusy Qtz lining vugs.
Also wk. erratic pyrite - filled fractures. The degree of silicifi-
wk. propylitiz'n.

granular Qtz veins

(Cont'd)

10-3-84 Paiute Hole no. 4

Recoveries

163-166	3'	37%
166-176	10'	100%
176-185	9'	100%
185-195	10'	94%
195-205	10'	100%
205-215	10'	98%
215-225	10'	100%
225-235	10'	100%
235-241½	6½'	100%
241½-248	6½'	89%
248-254½	6½'	100%
254½-262	7½'	92%
262-272	10'	100%

10-2-84 Paiute Hole no. 4

166.1 – 178.1'

- cation becomes weaker with depth and becomes more patchy. where the rock is not silicified it is moderately argillized. There is some evidence of brecciation of wall rocks and infilling with silica. From 169-171' there is some minor hematite-staining in the rock that is pervasive. Locally the Qtz veining becomes moderate (10-25% of rock), but only in small amounts and numerous enough not to break them out individually. At 172.5' to 178.1 the dissem. pyrite becomes minor (< 1%) Qtz veining decreases, silicification decreases, pyrite decreases with depth.

178.1 – 181.1'

Med gray, mod. argillized welded lithic tuff with green propylitized lithic frags and dk gray silicified frags. Minor dissem. pyrite. wk fracturing. A few small yellowish or tan clay fracture fillings. Fracturing oriented at 40° and 5°.

181.1 – 229.5'

Same as 166-178', with wk

10-3-84 Paiute Hole no. 4

181.1 — 229.5'

~~moderate~~ granular Qtz + barite veins, etc. Minor pyrite. Rock becomes weak to mod. silicified.
Veins form a stockwork.
At 183.9 to 185.0 the Qtz veining is very strong (>25% of rock), there is much barite XtLs filling the vugs and the rock turned dk reddish-brown in color with gray and white veins.
At 185.0 to Same as 178-181, dk gray to med gray wk clay fillings, wk Qtz veining, non-stockwork.
At 185.7' theres a wk. 3/8" Qtz + barite + pyrite vein trending 60° and a tiny Qtz + hematite + py vein trending 5°, sinuously winding its way down the core to 186.7'
At 189.7' the Qtz veining is moderate Qtz + barite + pyrite ± hematite ~~wi~~ stockwork veins up to 1/2" wide to 190.5'
At 190.5 to 195.0' wk Qtz stockwork veining
At 195.0 to 209.7' the same wk stockwork veining but now Qtz + clay veinlets. (Weaker mineralization)
At 209.7 to 214.2' the Qtz stockwk is moderate and there is much tan barite in the Qtz veins too.

181.1 — 229.5'

At 214.2 to 218.7' the rock is the same as 178-181, same color & alt'n with no Qtz veins;
At 216.8' there is ~~a~~ nothing worth mentioning.
At 218.7 to 220.2' there is wk Qtz + clay stockwork stringers.
At 220.2 to 221.8' the rock is the same as 178-181', with no Qtz veins.
At 221.8' to 222.7' the rock has wk non-stockwork clay > Qtz veins.
At 222.7 to 223.7' the rock is the same as 178-181' with no veins.
At 223.7 to 225.0' there is a seam of gray mud and sheared tuff
At 225.0 to 225.7' the rock has wk non-stockwk clay + Qtz veins and is unsheared.
At 225.7 to 229.5' the rock is the same as 178-181', ~~except for a couple of scattered veins.~~
~~25° oriented clay > Qtz + hematite vein 3/8" thick at 229.8'~~
~~At 229~~

229.5 — 232.9'

Dk gray mod. argillized, wkly bleached, trace pyritic welded lithic tuff.
One Clay > Qtz + hematite vein oriented 25°, and 3/8" thick at 229.8'

10-3-84 Paiute Hole no. 4

232.9 — 233.5'
Sharp contact into a black, fine-grained basaltic dike cut by tiny calcite veinlets. ¼" thick chilled zone on the contacts. No noticeable baked zone in the tuff?

233.5 — 234.6'
Dk gray - black silicified welded lithic tuff. No pyritization. A tiny calcite veinlet ≈ parallel to core axis. Sharp contact.

234.6 — 235.1'
Dk green and Dk gray weakly fractured mod. argillized, wkly pyritic. A couple of small, bunchy calcite veinlets. Wk. propylitiz'n.

235.1 — 236.4'
Same as 234-235' except the rock is moderately silicified calcite filling fractures. Becomes wkly silicified with depth. Trace pyrite.

236.4 — 254.5
Same as 234-235' no silicif'n no veining of Qtz, only calcite stringers. Only trace pyrite. There is a dk gray strongly silicified patch now and then but usually no bigger than a couple of inches across.

(Cont'd on next page)

Results of Paiute Drilling Assays
First Shipment — Hole no. 1 10-4-84

84009PG → 84068PG

	Au	Ag
51	.021	
60	.038	
61	.022	1.15
62	.015	1.03
63	.370	1.39

	Au oz/t	Ag oz/t	
84009PG			26-28
84010PG			28-30
84011PG			30-32
84050PG			108-110
84051PG	.021		110-112
84052PG			112-114
53			114-116
54			116-118
55			118-120
56			120-122
57			122-124
58			124-126
59			126-128
60	.038		128-130
61	.022	1.15	130-132
62	.015	1.03	132-134
63	.370	1.39	134-136
64			136-138
65			138-140
66			140-142
67			142-144
68			144-146

8ft avg 0.131 oz/ton Au equiv. @ $8 Ag $350 Au.

10-8-84 Paiute Drill Hole no. 4

254.5 – 272.0'

Sharp but gradational change to reddish-brown color; the rock is the same as 236-254' except the color. Some mod. argill., trace dissem. pyrite, but slight increase in propylitic minerals replacing the lithic fragments.
At 263.5' there is a 1/16" thick red hematite + clay fracture filling oriented 80°.
At 266.1 to 266.7' gouge zone 0° to core axis.

10-8-84 Paiute Hole no. 5
Recoveries

11.0 – 16.0'	5'	66%
16.0 – 22.0'	6'	99%
22½ – 32½'	10'	100%
32½ – 36	3½'	77%
36 – 41'	5'	66%
41 – 48'	7'	93%
48 – 52'	4'	80%
52 – 60'	8'	89%
60 – 69½'	9½'	86%
69½ – 71'	1½'	76%
71 – 80'	9'	98%
80 – 86'	6'	95%
86 – 96'	10'	92%
96 – 106'	10'	91%
106 – 116'	10'	81%
116 – 126'	10'	99%
126 – 136'	10'	84%
136 – 144'	8'	100%
144 – 154'	10'	100%
154 – 164'	10'	98%
164 – 170'	6'	87%
170 – 176'	6'	100
176 – 180'	4'	93
180 – 186'	6'	92
186 – 195'	9'	53
195 – 202'	7'	88
202 – 206'	4'	100
206 – 216'	10'	100
216 – 221'	5'	100
221 – 226'	5'	92
226 – 230'	4'	80
230 – 236'	6'	97
236 – 246'	10'	100

10-8-84 Paiute Hole no. 5

11.0 – 15.8'

Minor limon on fracts.

Lt grayish-green, bleached, strongly argillized, non-pyritic, mod. propylitized welded lithic tuff. Most of the lithics are green clay but some are dk gray silicified chunks, angular.

15.8 – 29.2'

Same as 11–15' except it is sheared-up. Gradional contact.

29.2 – 29.5'

The first 4" are strongly argillized, pervasively FeOx-stained sheared zone. Then a sharp contact into next zone

29.5 – 32.2'

Massive white bull Qtz highly fract'd with spaces filled by minor clay and limonite + goethite. Strong fract'g At 30.9' there is more silica-flooding of the tuff and less fractured bull Qtz, also more clay filling in the larger fractures. At 30.9' the core takes on a bluish-green tinge

32.2 – 35.6'

Shear zone...

Strongly argillized lt bluish-green mod. propylitized welded lithic tuff w/ white calcite stringers some patches of silicification and wk busted-up Qtz veins strongly fractured zone. Minor limonite on some fractures. Where silicif occurs, it is strong.

10-9-84 Paiute Hole no. 5

32.2 – 35.6'

At 34.7' tiny gray or colorless chalcedonic Qtz stock work veining appears and continues to 35.6'

35.6 – 37.5'

Same as 32–35' except unsheared. No pyrite here either. The veins form a wk irregular stockwork that is very bunchy. The veins in this zone are granular-sugary Qtz and coarse Xtline Qtz, not chalcedonic.

~~At 37.5' there is a wk pervasive jarosite + limonite stain of the rock. Fracturing still strong.~~

37.5 – 41.2'

Shear zone with a wk pervasive limonite + jarosite stain. (40°) Very clayey zone – gougy.

41.2 – 43.6'

Olive-green, strongly-argillized, mod. propylitized, pyritic welded lithic tuff with moderate Qtz stockwk veining of white Qtz. About 1% dissem. cubes of pyrite. The Qtz is vuggy

Color change at 42.0 to med-grayish-green. The disseminated pyrite in this zone has a very golden yellow color due to oxid'n but it is not gold. Too hard, cubic, etc, w/ striated faces.

10-9-84 Paiute Hole no. 5

41.2 — 43.6'
The mod. Qtz stockwk veining ends at 42.9' and becomes weak stockwork veining of granular-sugary white Qtz.

43.6 — 44.1
Narrow grayish-green gougy shear zone. Sharp contact into zone oriented 80° to core, and the sharp contact out of the shear zone is oriented 60° to core axis. 2-3% dissem py in this zone.

44.1 — 47.1'
Some med. grayish-green, strong argillized tuff with only minor dissem. pyrite and wk stockwork of white clay + Qtz ± limonite veinlets of small size.
At 45.1' to 47.1' the Clay + Qtz ± limonite veinlets become mod. instead of wk.

47.1 — 50.3'
Core becomes bright bluish-green, strongly Silica-flooded (SiO_2 repl'd) with moderate Qtz stockwk veining. Mod pyritiz. disseminated. Strong limonite + Jarosite staining on fractures. Strongly fractured zone. Strong propylitic alt'n. The white Qtz in the veins is granular-sugary. 1-3% dissem cubic fine pyrite. At end of zone amount of and degree of silicification decreases,

10-9-84 Paiute Hole no. 5

47.1 - 50.3'
and the rock grades back to bleached-looking med. grayish-green color.

50.3 — 71.2'
Same as 44-47' except the Qtz veins have no clay, the veins are bigger (up to ½") and the veining alternates between being weak or being moderate in intensity over very short distances. (Bunchy).
This Qtz is quite vuggy, sugary granular and vugs contain large clear bladed Xtls of barite. There is 1-3% pyrite disseminated also. Minor limonite + goethite staining on fractures.
At 53.6' satiny gypsum fills a vug in Qtz vein.
At 54.7 to 55.4' the Qtz veining is very strong, very vuggy.
At 60.0' the pyrite decreases to less than 1%, and becomes a bit coarser. The other change that occurs is there is, again, clay mixed w/ Qtz in the veins. There is also minor ~~tn~~ barite filling vugs in the Qtz too.
At 68.1' to 71.2' the wk Qtz veining becomes non-stockwork fracture fillings of Qtz ± barite ± clay.

10-9-84 Paiute Hole no. 5

71.2 — 72.7'

Sharp but irregular contact into tan to lt. reddish-brown wkly to strongly silicified, previously altered welded lithic tuff with poorly preserved texture. 2% dissem very fine pyrite. Contact parallel foliat-ion.

72.7 — 76.2'

Bleached-looking, lt greenish-gray, strongly-argillized, wkly propylitized, wkly pyritic welded lithic tuff. Wk. Qtz veining, of granular-sugary type. Sharp but gradational contact into next zone.

76.2 — 79.3'

Purplish-brown, moderately-argillized, non-pyritic, wkly-fractured, trace propylitized welded lithic tuff. Clay (white) fracture-fillings minor.

79.3 — 89.7'

Quick but gradational contact into lt. ~~gray~~ greenish-gray, bleached-looking, strongly-argillized, welded lithic tuff. Wkly propylitized. Moderately fractured. Wk clay-filled fracture-fillings. Past 81.0' the fracturing becomes weak. Non-pyritic rock throughout.

89.7 — 92.2'

Strongly argillized zone containing large amounts of yellowish-green clay. Rock texture almost completely destroyed here. No pyrite.

10-9-84 Paiute Hole #5.

89.7 — 92.2'

Locally the rock looks sheared, but not throughout.

92.2 — 96.0'

Quick gradational contact into Dk. ~~Red~~ ~~reddish-brown~~ PURPLE moderately argillized welded lithic tuff. Non-pyritic. Wk propylitic alteration of lithic fragments in the tuff to green minerals. There are bleached-out remnants of biotite in the rock, so it is not terribly strongly altered.

96.0 — 96.8'

Transitional contact (quick) into olive-green strongly argillized and moderately bleached welded lithic tuff. Much clay here. The other contact is transitional and irregular back into Dk reddish-brown tuff.

96.8 — 106.0'

Dk ~~reddish-brown~~ purple mod. argillized tuff just the same as 92-96'.

106.0 — 119.5'

Lt gray, bleached-looking, mod. argillized, wkly propylitized, wkly pyritic welded tuff with yellowish-green alt'd lithic fragments in it. Bleached remnants of biotite XtLs in the tuff matrix. Then a sharp contact into next zone.

Minor clay-fract. fillings
wk. fracturing

10-9-84 Paiute Hole no. 5

119.5 — 125.0'
Med. gray, wkly argillized, wkly bleached, welded lithic tuff with very well-preserved volcanic texture and somewhat-bleached dk. gray biotite Xtls. No pyrite. Very weak fracturing, and minor light-colored clay fracture fillings. One is up to ½" across. and yellow in color. Trace number of red hairline clay + hematite fracture fillings.

125.0 — 126.3'
Sharp contact into hematitic clay gouge zone sub parallel to core axis. Strong hematite here.

126.3 — 141.5'
Same as 119-125' with pyrite (wk) and mod. argillic, wk propylitic. Moderately fractured.
Wk. Qtz veining; sugary-granular clear Qtz + limonite in tiny veinlets that may form a wk stockwork. (?) Past 136' the Qtz veins contain clay also, but keep the granular texture. Clay fracture fillings become larger and slightly more numerous past 136'. There are minor hairline Qtz veins. Most of the veins you see are massive soapy gray clay veinlets that appear similar to chalcedonic Qtz but are far too soft.

10-9-84 Paiute Hole no. 5

141.5 — 149.8'
Same as previous zone except no minor Qtz veinlets only those gray chalcedonic-looking clay veinlets.
The rock is slowly becoming Med. gray in color and the degree of argillization and bleaching are decreasing. There are gray remnants of biotite Xtls in the rock.
Fracturing is weak. Pyrite has decreased to only trace amts.

149.8 — 151.6'
Sharp contact entering a (45°) clay-filled gray gougey zone.

151.6 — 152.8'
Mixed greenish-gray and reddish-gray strongly argillized, strongly fractured rock that is cut by clay + silica fillings of a chalcedonic nature. (Clay > silica) No pyrite. Minor white bunchy Qtz veins.

152.8 — 154.2'
Lt. gray bleached looking mod. argillized, wkly propylitized, non-pyritic, welded lithic tuff. wk clay fillings.

154.2 — 157.5'
Same as before except with yellow and red clay + Qtz + py veinlets, non-stockwk, pretty weak.

10-11-84 Paiute Hole no. 5

157.5 – 159.2'
Same as 152–154' except only clay + pyrite + hematite veinlets, wk, non-stockwork.

159.2 – 162.1'
Same as 152–154' except there are a trace number of thin, wk. Qtz + clay and Clay + hematite and clay + limonite veinlets, non-stockwork, oriented 0–15° to core axis. The Qtz in the veins becoming more chalcedonic in appearance.

162.1 – 174.6'
Same as 152–154 except there are a trace number of ~~small~~ thin, weak clay + FeOx fracture fillings, non-stockwk.

174.6 – 179.2'
Med. gray, wkly argillized, wkly bleached, non-pyritic, welded lithic tuff; wkly propylitized. Has wk, thin, non-stockwork fract. fillings of clay + hematite / clay / or calcite + adularia; wkly bleached biotite flakes.

179.2 – 180.8'
Same as 174–179' except moderately propylitized

10-11-84

Report from Hunter Labs . . .

	Au	Ag		
84 495 PG	.21	1.06	#4	96-98'
84 500 PG	.018	4.91	#4	106+108'
84 129 PG	.181	12.0	#1	206-208'

10-12-84 Paiute Hole no. 5

180.8 – 184.0
Quick transitional contact into Med. grayish-green, mod. argill, bleached, non-pyritic, mod. propylitized welded lithic tuffs cut by wk network of ~~calcite~~ calcite-adular. veinlets 1/16" thick, and also some clay veinlets (fracture fills).

184.0 – 186.0'
Same as 180–184' Except there are now some tiny sugary-granular Qtz veinlets 1/32" thick
There is a decrease in the number & strength of the calcite + adularia veinlets. Trace pyrite dissem.

[redacted]

10-12-84 Paiute Hole no. 5

186.0 — 187.3'
The rock has quickly become str. argillized, mod. bleached to lt. gray color. There are still weak calcite + adularia veinlets and some clay fracture fillings. The argilliz. increases with depth and the rock becomes a greenish gray, dark compact hard rock composed of massive soapy-looking clay.

187.3 — 188.3
Sharp 40° contact into a gray clay gouge zone.
At 187.6 to 187.9' there is a beautiful breccia with silicified angular fragments matrix-supported with cryptocrystalline white Qtz that is cut by a moderate stockwork of small Qtz veins.
Sharp 40° contact out of the zone that contains a 1/4" wide calcite + adularia vein. 1% py in Qtz zone.

188.3 — 198.3
Med. gray, str. argillized, welded lithic tuff with strong Qtz veining and breccia fillings. Minor pyrite; also possibly some adularia content in the Qtz? The Qtz is looking cryptocrystalline and chalcedonic. Mod. propylitic minerals.

10-12-84 Paiute Hole no. 5

188.3 — 198.3'
At 197.0 the veining decreases to moderate.

198.3 — 198.6'
Gray clay-filled shear zone with gouge in it.

198.6 — 208.7'
Med gray, strongly-argillized, wkly propylitized, trace pyritic welded lithic tuff.
Weakly fractured. Trace tiny calcite veinlets

208.7 — 211.7
Quick gradational contact into Dk reddish-brown, strongly argillized, wkly propylitized. non-pyritic welded lithic tuff.
Still wkly fractured.

211.7 — 220.6'
Back into the same as 198-208 except no pyrite, no calcite veinlets. Small dk gray silicif patches.

220.6 — 228.2' Dk reddish-brown, moderately argillized, wkly propylitized, non-pyritic welded lithic tuff.
At 225.1' there is a 1" wide yellow, white, and red colored Qtz + clay ± hematite ± limonite vein, vuggy, cryptocrystalline.

10-12-84 Paiute Hole no. 5

Recoveries

246 – 256	10'	100%
256 – 266	10'	100%

10-12-84 Paiute Hole no. 5

228.2' – 246.4'
Med. gray tuff, strongly argillized, somewhat bleached same as 198-208'. Theres a couple of isolated dk gray silicified patches 2-3" across. Minor clay fillings.

246.4 — 266.0'
Dk red-+brown mod. argillized welded lithic tuff same as 220-228'.
At 262.0' there is a small white calcite veinlet.
There are some bleached biotite flakes in the rock.

TD

10-12-84 Paiute Hole no. 6.

143.8 — 147.5'
Qtz stockwork veining is moderate. There is good brecciation and minor silica-flooding assoc. with the vein margins. Minor Py. Some of the veins are composed of Qtz+Py. Pervasive limonite staining on and near fractures.
There is a 2" wide zone of massive limonitic clay @ 145.8'

147.5 — 164.5'
Qtz veining becomes weak stockwk. Rock is lt. gray, strongly argillized, mod. bleached welded lithic tuff with indistinct texture. Limonite staining on fractures. The Qtz in the veins is vuggy, fine granular-sugary. <1% py in veins and dissem. Past 159.5' the stockwk becomes very weak, the veins are very thin.
At, Oh, the last 4 feet of this section you find Hemat + limonite mixed in the vein material.

164.5' — 173.0'
Rock is lt. gray mod. bleached, mod. argillized, non-pyritic welded lithic tuff. The foliation of the welding is not very distinct.
At 166.3 to 167.0' this is a small granular Qtz + limonite veinlet sub-parallel to the core axis.
There are bleached-out remnants of biotite flakes in this zone. (Cont'd)

10-16-84 Paiute Hole no. 6

164.5 — 173.0'
Another minor bunchy Qtz vein oriented at 25° is at 172.5-173.0'

173.0 — 178.1'
Lt. gray gouge shear zone with ≈1% fine dissem. pyrite in the clay.
The contact into the zone is not preserved. The contact out of the zone is ⊥ to core axis and very irregular. (undulating) Sharp contact.

178.1 — 181.3'
Dk gray variably silica replaced and strongly veined and mod. brecciated zone. The wall rock tuff is silica replaced and the zone averages 2% fine dissem. pyrite. The pyrite in the veins is coarser and euhedral, compared to that in the wall rock.
Sharp contact into dike rock.

181.3 — 184.1'
Black fine-grained basaltic dike, strongly fractured and limonite-stained on fractures.
At 184.0' the grain-size of the dike increases and there are white calcite amygdules in it, and thin white calcite veinlets.
(The dike occupies a fault zone and has been reptured by later movem-ents?). Sharp contact oriented 30° to core axis.

10-16-84 Paiute Hole no. 6

184.1 — [redacted] 192.5'
Sharp contact into the same dike material that has been strongly fractured and heavily limonite stained pervasively to give the rock a dark brown appearance.

192.5' [redacted] → 201.3'
Back into fresh dike rock. Contact out of the dike is orient'd 40° to core axis.

201.3 — 202.6'
Zone of moderate Qtz + FeOx (hematite) veining as a stockwk. Veins contain fine brecciated material. Wall rock is strongly argillized dk greenish-gray welded lithic tuff. There is some hematite disseminated in the tuff matrix. Wk. propylitic alt'n.

202.6 — 204.7'
Same as the wall rock in 201-202' without the veining, the degree of argillization has decreased to moderate here too.

204.7 — 205.1'
Same in appearance as 202-204' except wkly silicified pervasively and pervasively hematite stained.

205.1 — 206.2'
Same as 202-204'.

10-16-84 Paiute Hole no. 6

206.2 — 207.7'
Same as 202-204' except wkly silicified pervasively and pervasively hematite stained. The foliation of the welding in the tuff is oriented ≈ 45° to core axis.

207.7 — 211.4'
Quick but gradational change into med. gray, mod. argillized non-propylitized, non-pyritic welded lithic tuff. Moderately fractured, and wkly limonite stained on faces. The argillization decreases to nil by the end of this section. Unaltered biotite flakes at the end of this zone.

211.4 — 215.0
Reddish-brown wkly argillized welded lithic tuff.

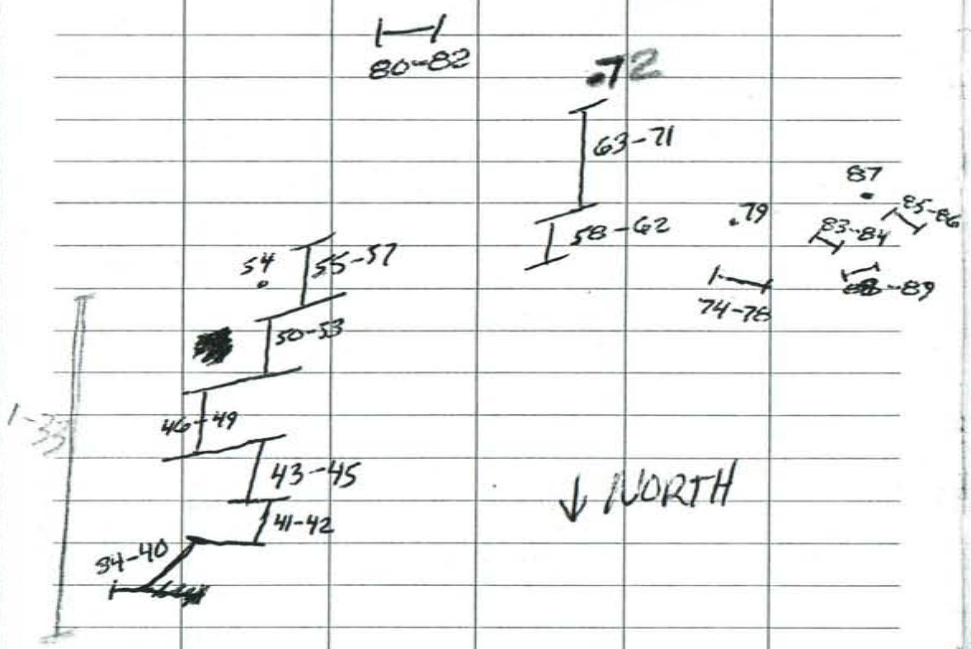
TD

10-17-84

Going out to the property to survey in the samples taken in the area of the drilling project

1-33, 50, 60-61, 72, 81 have all been surveyed. 83

The following sketch map are the remaining samples that need to be surveyed in.



Couldn't make it in to the property today: tires on the truck are too shitty, no traction.

10-17-84 Paiute Hole no. 3

Additional Structural Data.

~~@ 28.5' Thin non-stockwork Qtz veins oriented 70° and 35°~~

31.7' Thin non-stockwork Qtz veins oriented 60°, 80° to core axis

13.0' foliation of welding in the tuff 35°

56.6' Qtz vein 50°

82.7' fractures 15°

91.5' Qtz vein 40°

99.3' foliation welding 50°

104.7' Qtz vein 35°

123.3' [redacted] 40° contact into clay zone.

146.3' Clay vein 5°

161.3' Clay veinlet 80° ; foliation 45°

188.6' Qtz + limonite + clay vein 45° cuts foliation which is 60°

201.1' Clay veinlets 32°

154.8' fracture 72°

175.1' fracture 80°

206.1' fracture 35°

213.4' fracture 13°

223.6' fracture 60°

221.0' foliation 65°

10-18-84 Paiute Hole no. 6

Additional Structural Information

13.5' foliation 55°
23.7' fracture // foliation 56°
50.0' calcite + py + prop. mmts veinlet 20°
63.4' foliation 60°
50.0' Qtz veinlet 80°
47.4' fractures 45° & 65° with different orientations of strike
66.0' Qtz vein 65° (not // to foliation)
69.0' fracture 70° cutting foliation
84.8' foliation 80°, fractures 10°
98.8' foliation 55°, and fractures parallel.
112.6' fracture 27°
118.6' Qtz vein 65°

10-18-84
Surveying in Paiute surface rock chip sample locations in the drilling area.

From Holes 3,4,5,6 to #84034PR ?
141°, +10°, 60'
From 84034 to 84040, 35', 30°, +45½°
From 84040 to 84041, 41', 292°, +4°
84041 to 84042, 12', 223°, +37°
84040 to 84043, 12', 202°, +24°
84043 to 84045, 25', 141°, +14°
84045 to 84046, 51', 155°, +1°
84046 to 84049, 27', 260°, +30°
84049 to 83087, 21', 245°, +33½°
84049 to 84050, 11', 227°, 33°
84050 to 84053, 34', 269°, 44½°
84053 to 84054, 30', 308°, -1°
84054 to 84055 & 83084, 25', 286°, +13°
84055 & 83084 to 84057, 21', 195°, +43°
84057 to 84058, 87', 307°, +3°
84058 to 84061, 28', 197°, +41°
84061 to 84062, 16', 275°, +22°
84062 to 84063, 17', 316°, +1½°
84063 to 84067, 57', 185°, +27½°
84067 to 84068, 26', 305°, +3°
84068 to 84072, 38', 181°, +30°
84072 to 84073, 39', 320°, -6°
84073 to 84074, 189', 300°, +3½°
83033 → 84074 to 84078, 30', 304°, -3½°
84078 to 84079 & 83032, 67', 191°, +25°
84078 to 84088, 82', 283°, -4°
84083 to 84084, 19',

Field 3

1 rock
2 soil.
3 veg
4 drilling
5 stream sed
6 fluid incl.

Field 4

1 dump or adit
2 pyritic
3 non-pyritic
4 - 20 mesh
5 heavy mineral conc.
6 duplicates
7 orientation
8 recon
9 standard
10 reron

Field 5

1 purple
2 bleached.
3 gray
4 red
5 white

Field 6

1 silicic
2 argillic
3 propylitic
4 argillic & silicic

Field 7

1 welded
2 lapilli
3 lithic
4 Qtz
5 Qtz + pyrite
6 calcite veined
7 goethite + stained
8 welded / lithic
9

Field 8

1 Lower Hartford Hill
2 Middle "
3 Upper "
4 Pyramid Fm
5 Shear / Fault Zone
6 Stockwork / stringers / Breccia.

CURVE TABLES

HOW TO USE CURVE TABLES

Table I. contains Tangents and Externals to a 1° curve. Tan. and Ext. to any other radius may be found nearly enough, by dividing the Tan. or Ext. opposite the given Central Angle by the given degree of curve.

To find Deg. of Curve, having the Central Angle and Tangent: Divide Tan. opposite the given Central Angle by the given Tangent.

To find Deg. of Curve, having the Central Angle and External: Divide Ext. opposite the given Central Angle by the given External.

To find Nat. Tan. and Nat. Ex. Sec. for any angle by Table I.: Tan. or Ext. of twice the given angle divided by the radius of a 1° curve will be the Nat. Tan. or Nat. Ex. Sec.

EXAMPLE

Wanted a Curve with an Ext. of about 12 ft. Angle of Intersection or I. P. = 23° 20′ to the R. at Station 542+72.

Ext. in Tab. I opposite 23° 20′ = 120.87
120.87 ÷ 12 = 10.07. Say a 10° Curve.

Tan. in Tab. I opp. 23° 20′ = 1183.1
1183.1 ÷ 10 = 118.31.

Correction for A. 23° 20′ for a 10° Cur. = 0.16
118.31 + 0.16 = 118.47 = corrected Tangent.

(If corrected Ext. is required find in same way)
Ang. 23° 20′ = 23.33° ÷ 10 = 2.3333 = L. C.

2° 19½′ = def. for sta.	542	I. P. = sta.	542+72
4° 49½′ = " " "	+50	Tan. =	1 .18.47
7° 19½′ = " " "	543	B. C. = sta.	541+53.53
9° 49½′ = " " "	+50	L. C. =	2 .33.33
11° 40′ = " " "	543+		
	86.86	E. C. = Sta.	543+86.86

100 − 53.53 = 46.47 × 3′(def. for 1 ft. of 10° Cur.) = 139.41′ =
2° 19½′ = def. for sta. 542.

Def. for 50 ft. = 2° 30′ for a 10° Curve.
Def. for 36.86 ft. = 1° 50½′ for a 10° Curve.

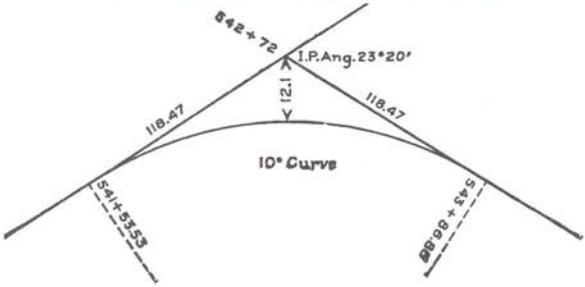


Table I. — Tangents and Externals to a 1° Curve.
Chord = 100 ft.

Int. Angle	Tangent	External	Int. Angle	Tangent	External	Int. Angle	Tangent	External
1°	50.00	.22	8°	400.66	13.99	15°	754.32	49.44
10′	58.34	.30	10′	409.03	14.58	10′	762.80	50.55
20	66.67	.39	20	417.41	15.18	20	771.29	51.68
30	75.01	.49	30	425.79	15.80	30	779.77	52.82
40	83.34	.61	40	434.17	16.43	40	788.26	53.97
50	91.68	.73	50	442.55	17.07	50	796.75	55.13
2	100.01	.87	9	450.93	17.72	16	805.25	56.31
10	108.35	1.02	10	459.32	18.38	10	813.75	57.50
20	116.68	1.19	20	467.71	19.06	20	822.25	58.70
30	125.02	1.36	30	476.10	19.75	30	830.76	59.91
40	133.36	1.55	40	484.49	20.45	40	839.27	61.14
50	141.70	1.75	50	492.88	21.16	50	847.78	62.38
3	150.04	1.96	10	501.28	21.89	17	856.30	63.63
10	158.38	2.19	10	509.68	22.62	10	864.82	64.90
20	166.72	2.43	20	518.08	23.38	20	873.35	66.18
30	175.06	2.67	30	526.48	24.14	30	881.88	67.47
40	183.40	2.93	40	534.89	24.91	40	890.41	68.77
50	191.74	3.21	50	543.29	25.70	50	898.95	70.09
4	200.08	3.49	11	551.70	26.50	18	907.49	71.42
10	208.43	3.79	10	560.11	27.31	10	916.03	72.76
20	216.77	4.10	20	568.53	28.14	20	924.58	74.12
30	225.12	4.42	30	576.95	28.97	30	933.13	75.49
40	233.47	4.76	40	585.36	29.82	40	941.69	76.86
50	241.81	5.10	50	593.79	30.68	50	950.25	78.26
5	250.16	5.46	12	602.21	31.56	19	958.81	79.67
10	258.51	5.83	10	610.64	32.45	10	967.38	81.09
20	266.86	6.21	20	619.07	33.35	20	975.96	82.53
30	275.21	6.61	30	627.50	34.26	30	984.53	83.97
40	283.57	7.01	40	635.93	35.18	40	993.12	85.43
50	291.92	7.43	50	644.37	36.12	50	1001.7	86.90
6	300.28	7.86	13	652.81	37.07	20	1010.3	88.39
10	308.64	8.31	10	661.25	38.03	10	1018.9	89.89
20	316.99	8.76	20	669.70	39.01	20	1027.5	91.40
30	325.35	9.23	30	678.15	39.99	30	1036.1	92.92
40	333.71	9.71	40	686.60	40.99	40	1044.7	94.46
50	342.08	10.20	50	695.06	42.00	50	1053.3	96.01
7	350.44	10.71	14	703.51	43.03	21	1061.9	97.57
10	358.81	11.22	10	711.97	44.07	10	1070.6	99.16
20	367.17	11.75	20	720.44	45.12	20	1079.2	100.75
30	375.54	12.29	30	728.90	46.18	30	1087.8	102.35
40	333.91	12.85	40	737.37	47.25	40	1096.4	103.97
50	392.28	13.41	50	745.85	48.34	50	1105.1	105.60

Corrections to be Added (T = Tangent. E = External.)

Int. Angle	Curve 5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
5°	T=.02 E=.000	.03 .000	.05 .001	.06 .001	.08 .002	.10 .002	.11 .002	.13 .003	.15 .003	.16 .004	.18 .004	.20 .004	.21 .005	.23 .005
10°	T=.03 E=.001	.06 .003	.09 .004	.13 .006	.16 .007	.19 .008	.22 .009	.25 .011	.28 .012	.31 .014	.34 .015	.38 .017	.42 .018	.46 .020
15°	T=.04 E=.003	.10 .007	.14 .010	.19 .014	.24 .018	.29 .023	.34 .027	.39 .029	.45 .032	.51 .035	.53 .039	.58 .043	.63 .047	.68 .051
20°	T=.06 E=.006	.13 .011	.19 .017	.26 .022	.32 .028	.39 .034	.45 .038	.51 .045	.58 .051	.65 .057	.72 .063	.79 .070	.84 .076	.90 .083
25°	T=.08 E=.009	.16 .018	.24 .027	.33 .036	.40 .046	.49 .056	.58 .065	.67 .074	.75 .083	.83 .093	.90 .106	.99 .120	1.06 .127	1.14 .135

Table I. — Tangents and Externals to a 1° Curve.
Chord = 100 ft.

Int. Angle	Tangent	External	Int. Angle	Tangent	External	Int. Angle	Tangent	External
22°	1113.7	107.24	29°	1481.8	188.51	36°	1861.7	294.9
10′	1122.4	108.90	10′	1490.7	190.74	10′	1870.9	297.7
20	1131.0	110.57	20	1499.6	192.99	20	1880.1	300.6
30	1139.7	112.25	30	1508.5	195.25	30	1889.4	303.5
40	1148.4	113.95	40	1517.4	197.53	40	1898.6	306.4
50	1157.0	115.66	50	1526.3	199.82	50	1907.9	309.3
23	1165.7	117.38	30	1535.3	202.12	37	1917.1	312.2
10	1174.4	119.12	10	1544.2	204.44	10	1926.4	315.2
20	1183.1	120.87	20	1553.1	206.77	20	1935.7	318.1
30	1191.8	122.63	30	1562.1	209.12	30	1945.0	321.1
40	1200.5	124.41	40	1571.0	211.48	40	1954.3	324.1
50	1209.2	126.20	50	1580.0	213.86	50	1963.6	327.1
24	1217.9	128.00	31	1589.0	216.3	38	1972.9	330.2
10	1226.6	129.82	10	1598.0	218.7	10	1982.2	333.2
20	1235.3	131.65	20	1606.9	221.1	20	1991.5	336.3
30	1244.0	133.50	30	1615.9	223.5	30	2000.9	339.3
40	1252.8	135.35	40	1624.9	226.0	40	2010.2	342.4
50	1261.5	137.23	50	1633.9	228.4	50	2019.6	345.5
25	1270.2	139.11	32	1643.0	230.9	39	2029.0	348.6
10	1279.0	141.01	10	1652.0	233.4	10	2038.4	351.8
20	1287.7	142.93	20	1661.0	235.9	20	2047.8	354.9
30	1296.5	144.85	30	1670.0	238.4	30	2057.2	358.1
40	1305.3	146.79	40	1679.1	241.0	40	2066.6	361.3
50	1314.0	148.75	50	1688.1	243.5	50	2076.0	364.5
26	1322.8	150.71	33	1697.2	246.1	40	2085.4	367.7
10	1331.6	152.69	10	1706.3	248.7	10	2094.9	371.0
20	1340.4	154.69	20	1715.3	251.3	20	2104.3	374.2
30	1349.2	156.70	30	1724.4	253.9	30	2113.8	377.5
40	1358.0	158.72	40	1733.5	256.5	40	2123.3	380.8
50	1366.8	160.76	50	1742.6	259.1	50	2132.7	384.1
27	1375.6	162.81	34	1751.7	261.8	41	2142.2	387.4
10	1384.4	164.86	10	1760.8	264.5	10	2151.7	390.7
20	1393.2	166.95	20	1770.0	267.2	20	2161.2	394.1
30	1402.0	169.04	30	1779.1	269.9	30	2170.8	397.4
40	1410.9	171.15	40	1788.2	272.6	40	2180.3	400.8
50	1419.7	173.27	50	1797.4	275.3	50	2189 9	404.2
28	1428.6	175.41	35	1806.6	278.1	42	2199.4	407.6
10	1437.4	177.55	10	1815.7	280.8	10	2209.0	411.1
20	1446.3	179.72	20	1824.9	283.6	20	2218.6	414.5
30	1455.1	181.89	30	1834.1	286.4	30	2228.1	418.0
40	1464.0	184.08	40	1843.3	289.2	40	2237.7	421.4
50	1472.9	186.29	50	1852.5	292.0	50	2247.3	425.0

Corrections to be Added (T = Tangent. E = External.)

Int. Angle	Curve 5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
20°	T=.06 E=.006	.13 .011	.19 .017	.26 .022	.32 .028	.39 .034	.45 .038	.51 .045	.58 .051	.65 .057	.72 .063	.79 .070	.84 .076	.90 .083
25°	T=.08 E=.009	.16 .018	.24 .027	.33 .036	.40 .046	.49 .056	.58 .065	.67 .074	.75 .083	.83 .093	.90 .106	.99 .120	1.06 .127	1.14 .135
30°	T=.10 E=.013	.19 .025	.29 .038	.39 .051	.49 .065	.59 .078	.69 .090	.79 .103	.89 .116	.99 .129	1.09 .149	1.20 .170	1.29 .179	1.39 .188
35°	T=.11 E=.018	.22 .035	.34 .054	.47 .072	.58 .086	.69 .109	.80 .131	.93 .153	1.05 .175	1.17 .197	1.29 .213	1.42 .230	1.54 .247	1.66 .264
40°	T=.13 E=.023	.26 .046	.40 .070	.53 .093	.67 .117	.80 .141	.93 .172	1.06 .203	1.20 .234	1.34 .265	1.49 .277	1.64 .290	1.79 .315	1.94 .341
45°	T=.15 E=.030	.30 .060	.44 .093	.60 .119	.76 .153	.91 .184	1.06 .216	1.21 .254	1.37 .289	1.52 .325	1.70 .351	1.87 .378	2.04 .411	2.21 .445

Table I. — Tangents and Externals to a 1° Curve.
Chord = 100 ft.

Int. Angle	Tangent	External	Int. Angle	Tangent	External	Int. Angle	Tangent	External
43°	2257.0	428.5	**50°**	2671.8	592.3	**57°**	3110.9	790.1
10′	2266.6	432.0	10′	2681.9	596.6	10′	3121.7	795.2
20	2276.2	435.6	20	2692.1	600.9	20	3132.6	800.4
30	2285.9	439.2	30	2702.3	605.3	30	3143.4	805.6
40	2295.6	442.8	40	2712.5	609.6	40	3154.2	810.9
50	2305.2	446.4	50	2722.7	614.0	50	3165.1	816.1
44	2314.9	450.0	**51**	2732.9	618.4	**58**	3176.0	821.4
10	2324.6	453.6	10	2743.1	622.8	10	3186.9	826.7
20	2334.3	457.3	20	2753.4	627.2	20	3197.8	832.0
30	2344.1	461.0	30	2763.7	631.7	30	3208.8	837.3
40	2353.8	464.6	40	2773.9	636.2	40	3219.7	842.7
50	2363.5	468.4	50	2784.2	640.7	50	3230.7	848.1
45	2373.3	472.1	**52**	2794.5	645.2	**59**	3241.7	853.5
10	2383.1	475.8	10	2804.9	649.7	10	3252.7	858.9
20	2392.8	479.6	20	2815.2	654.3	20	3263.7	864.3
30	2402.6	483.4	30	2825.6	658.8	30	3274.8	869.8
40	2412.4	487.2	40	2835.9	663.4	40	3285.8	875.3
50	2422.3	491.0	50	2846.3	668.0	50	3296.9	880.8
46	2432.1	494.8	**53**	2856.7	672.7	**60**	3308.0	886.4
10	2441.9	498.7	10	2867.1	677.3	10	3319.1	892.0
20	2451.8	502.5	20	2877.5	682.0	20	3330.3	897.5
30	2461.7	506.4	30	2888.0	686.7	30	3341.4	903.2
40	2471.5	510.3	40	2898.4	691.4	40	3352.6	908.8
50	2481.4	514.3	50	2908.9	696.1	50	3363.8	914.5
47	2491.3	518.2	**54**	2919.4	700.9	**61**	3375.0	920.2
10	2501.2	522.2	10	2929.9	705.7	10	3386.3	925.9
20	2511.2	526.1	20	2940.4	710.5	20	3397.5	931.6
30	2521.1	530.1	30	2951.0	715.3	30	3408.8	937.3
40	2531.1	534.2	40	2961.5	720.1	40	3420.1	943.1
50	2541.0	538.2	50	2972.1	725.0	50	3431.4	948.9
48	2551.0	542.2	**55**	2982.7	729.9	**62**	3442.7	954.8
10	2561.0	546.3	10	2993.3	734.8	10	3454.1	960.6
20	2571.0	550.4	20	3003.9	739.7	20	3465.4	966.5
30	2581.0	554.5	30	3014.5	744.6	30	3476.8	972.4
40	2591.0	558.6	40	3025.2	749.6	40	3488.3	978.3
50	2601.1	562.8	50	3035.8	754.6	50	3499.7	984.3
49	2611.2	566.9	**56**	3046.5	759.6	**63**	3511.1	990.2
10	2621.2	571.1	10	3057.2	764.6	10	3522.6	996.2
20	2631.3	575.3	20	3067.9	769.7	20	3534.1	1002.3
30	2641.4	579.5	30	3078.7	774.7	30	3545.6	1008.3
40	2651.5	583.8	40	3089.4	779.8	40	3557.2	1014.4
50	2661.6	588.0	50	3100.2	784.9	50	3568.7	1020.5

Corrections to be Added (T = Tangent. E = External.)

Int. Angle	Curve 5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
40°	T=.13 E=.023	.26 .046	.40 .070	.53 .093	.67 .117	.80 .141	.93 .172	.106 .203	1.20 .234	1.34 .265	1.49 .277	1.64 .290	1.79 .315	1.94 .341
45°	T=.15 E=.030	.30 .060	.44 .093	.60 .119	.76 .153	.91 .184	1.06 .216	1.21 .254	1.37 .289	1.52 .325	1.70 .351	1.87 .378	2.04 .411	2.21 .445
50°	T=.17 E=.037	.34 .075	.51 .116	.68 .151	.85 .189	1.02 .227	1.19 .266	1.36 .305	1.54 .345	1.72 .384	1.91 .425	2.10 .467	2.29 .508	2.48 .550
55°	T=.19 E=.046	.38 .093	.57 .142	.76 .188	.95 .236	1.14 .283	1.32 .332	1.52 3.81	1.72 .420	1.92 .479	2.14 .530	2.35 .582	2.56 .641	2.77 .700
60°	T=.21 E=.056	.42 .112	.63 .168	.84 .225	1.05 .283	1.27 .340	1.49 .398	1.71 .457	1.94 .516	2.17 .575	2.38 .636	2.60 .697	2.83 .774	3.07 .851
65°	T=.23 E=.067	.46 .135	.69 .204	.93 .273	1.16 .343	1.40 .412	1.64 .483	1.88 .554	2.13 .625	2.38 .697	2.63 .711	2.88 .845	3.13 .922	3.39 1.01

Table I. — Tangents and Externals to a 1° Curve.
Chord = 100 ft.

Int. Angle	Tangent	External	Int. Angle	Tangent	External	Int. Angle	Tangent	External
64°	3580.3	1026.6	**71°**	4086.9	1308.2	**78°**	4639.8	1643.0
10′	3591.9	1032.8	10′	4099.5	1315.6	10′	4653.6	1651.7
20	3603.5	1039.0	20	4112.1	1322.9	20	4667.4	1660.5
30	3615.1	1045.2	30	4124.8	1330.3	30	4681.3	1669.2
40	3626.8	1051.4	40	4137.4	1337.7	40	4695.2	1678.1
50	3638.5	1057.7	50	4150.1	1345.1	50	4709.2	1686.9
65	3650.2	1063.9	**72**	4162.8	1352.6	**79**	4723.2	1695.8
10	3661.9	1070.2	10	4175.6	1360.1	10	4737.2	1704.7
20	3673.7	1076.6	20	4188.5	1367.6	20	4751.2	1713.7
30	3685.4	1082.9	30	4201.2	1375.2	30	4765.3	1722.7
40	3697.2	1089.3	40	4214.0	1382.8	40	4779.4	1731.7
50	3709.0	1095.7	50	4226.8	1390.4	50	4793.6	1740.8
66	3720.9	1102.2	**73**	4239.7	1398.0	**80**	4807.7	1749.9
10	3732.7	1108.6	10	4252.6	1405.7	10	4822.0	1759.0
20	3744.6	1115.1	20	4265.6	1413.5	20	4836.2	1768.2
30	3756.5	1121.7	30	4278.5	1421.2	30	4850.5	1777.4
40	3768.5	1128.2	40	4291.5	1429.0	40	4864.8	1786.7
50	3780.4	1134.8	50	4304.6	1436.8	50	4879.2	1796.0
67	3792.4	1141.4	**74**	4317.6	1444.6	**81**	4893.6	1805.3
10	3804.4	1148.0	10	4330.7	1452.5	10	4908.0	1814.7
20	3816.4	1154.7	20	4343.8	1460.4	20	4922.5	1824.1
30	3828.4	1161.3	30	4356.9	1468.4	30	4937.0	1833.6
40	3840.5	1168.1	40	4370.1	1476.4	40	4951.5	1843.1
50	3852.6	1174.8	50	4383.3	1484.4	50	4966.1	1852.6
68	3864.7	1181.6	**75**	4396.5	1492.4	**82**	4980.7	1862.2
10	3876.8	1188.4	10	4409.8	1500.5	10	4995.4	1871.8
20	3889.0	1195.2	20	4423.1	1508.6	20	5010.0	1881.5
30	3901.2	1202.0	30	4436.4	1516.7	30	5024.8	1891.2
40	3913.4	1208.9	40	4449.7	1524.9	40	5039.5	1900.9
50	3925.6	1215.8	50	4463.1	1533.1	50	5054.3	1910.7
69	3937.9	1222.7	**76**	4476.5	1541.4	**83**	5069.2	1920.5
10	3950.2	1229.7	10	4489.9	1549.7	10	5084.0	1930.4
20	3962.5	1236.7	20	4503.4	1558.0	20	5099.0	1940.3
30	3974.8	1243.7	30	4516.9	1566.3	30	5113.9	1950.3
40	3987.2	1250.8	40	4530.4	1574.7	40	5128.9	1960.2
50	3999.5	1257.9	50	4544.0	1583.1	50	5143.9	1970.3
70	4011.9	1265.0	**77**	4557.6	1591.6	**84**	5159.0	1980.4
10	4024.4	1272.1	10	4571.2	1600.1	10	5174.1	1990.5
20	4036.8	1279.3	20	4584.8	1608.6	20	5189.3	2000.6
30	4049.3	1286.5	30	4598.5	1617.1	30	5204.4	2010.8
40	4061.8	1293.6	40	4612.2	1625.7	40	5219.7	2021.1
50	4074.4	1300.9	50	4626.0	1634.4	50	5234.9	2031.4

Corrections to be Added (T = Tangent. E = External.)

Int. Angle	Curve 5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
60°	T=.21 E=.056	.42 .112	.63 .168	.84 .225	1.05 .283	1.27 .340	1.49 .398	1.71 .457	1.94 .516	2.17 .575	2.38 .636	2.60 .697	2.83 .774	3.07 .851
65°	T=.23 E=.067	.46 .135	.69 .204	.93 .273	1.16 .343	1.40 .412	1.64 .483	1.88 .554	2.13 .625	2.38 .697	2.63 .711	2.88 .845	3.13 .922	3.39 1.01
70°	T=.25 E=.080	.51 .159	.76 .240	1.02 .321	1.28 .403	1.54 .485	1.80 .568	2.06 .652	2.33 .735	2.60 .819	2.88 .906	3.16 .994	3.44 1.08	3.72 1.17
75°	T=.27 E=.095	.56 .182	.83 .286	1.12 .383	1.40 .480	1.69 .578	1.98 .678	2.27 .777	2.57 .877	2.87 .977	3.16 1.07	3.47 1.18	3.78 1.29	4.09 1.39
80°	T=.30 E=.110	.61 .220	.91 .332	1.22 .445	1.53 .558	1.84 .671	2.15 .787	2.46 .903	2.78 1.02	3.10 1.13	3.44 1.25	3.78 1.38	4.12 1.50	4.46 1.62
85°	T=.33 E=.128	.66 .259	1.00 .391	1.33 .524	1.68 .657	2.02 .790	2.36 .926	2.70 1.06	3.05 1.20	3.40 1.34	3.77 1.47	4.14 1.62	4.55 1.76	4.89 1.91

Table I. — Tangents and Externals to a 1° Curve.
Chord = 100 ft.

Int. Angle	Tangent	External	Int. Angle	Tangent	External	Int. Angle	Tangent	External
85°	5250.3	2041.7	**92°**	5933.2	2518.5	**99°**	6708.6	3092.7
10′	5265.6	2052.1	10′	5950.5	2531.0	10′	6728.4	3107.7
20	5281.0	2062.5	20	5967.9	2543.5	20	6748.2	3122.9
30	5296.4	2073.0	30	5985.3	2556.0	30	6768.1	3138.1
40	5311.9	2083.5	40	6002.7	2568.6	40	6788.1	3153.3
50	5327.4	2094.1	50	6020.2	2581.3	50	6808.2	3168.7
86	5343.0	2104.7	**93**	6037.8	2594.0	**100**	6828.3	3184.1
10	5358.6	2115.3	10	6055.4	2606.8	10	6848.5	3199.6
20	5374.2	2126.0	20	6073.1	2619.7	20	6868.8	3215.1
30	5389.9	2136.7	30	6090.8	2632.6	30	6889.2	3230.8
40	5405.6	2147.5	40	6108.6	2645.5	40	6909.6	3246.5
50	5421.4	2158.4	50	6126.4	2658.5	50	6930.1	3262.3
87	5437.2	2169.2	**94**	6144.3	2671.6	**101**	6950.6	3278.1
10	5453.1	2180.2	10	6162.6	2684.7	10	6971.3	3294.1
20	5469.0	2191.1	20	6180.2	2697.9	20	6992.0	3310.1
30	5484.9	2202.2	30	6198.3	2711.2	30	7012.7	3326.1
40	5500.9	2213.2	40	6216.4	2724.5	40	7033.6	3342.3
50	5517.0	2224.3	50	6234.6	2737.9	50	7054.5	3358.5
88	5533.1	2235.5	**95**	6252.8	2751.3	**102**	7075.5	3374.9
10	5549.2	2246.7	10	6271.1	2764.8	10	7096.6	3391.2
20	5565.4	2258.0	20	6289.4	2778.3	20	7117.8	3407.7
30	5581.6	2269.3	30	6307.9	2792.0	30	7139.0	3424.3
40	5597.8	2280.6	40	6326.3	2805.6	40	7160.3	3440.9
50	5614.2	2292.0	50	6344.8	2819.4	50	7181.7	3457.6
89	5630.5	2303.5	**96**	6363.4	2833.2	**103**	7203.2	3474.4
10	5646.9	2315.0	10	6382.1	2847.0	10	7224.7	3491.3
20	5663.4	2326.6	20	6400.8	2861.0	20	7246.3	3508.2
30	5679.9	2338.2	30	6419.5	2875.0	30	7268.0	3525.2
40	5696.4	2349.8	40	6438.4	2889.0	40	7289.8	3542.4
50	5713.0	2361.5	50	6457.3	2903.1	50	7311.7	3559.6
90	5729.7	2373.3	**97**	6476.2	2917.3	**104**	7333.6	3576.8
10	5746.3	2385.1	10	6495.2	2931.6	10	7355.6	3594.2
20	5763.1	2397.0	20	6514.3	2945.9	20	7377.8	3611.7
30	5779.9	2408.9	30	6533.4	2960.3	30	7399.9	3629.2
40	5796.7	2420.9	40	6552.6	2974.7	40	7422.2	3646.8
50	5813.6	2432.9	50	6571.9	2989.2	50	7444.6	3664.5
91	5830.5	2444.9	**98**	6591.2	3003.8	**105**	7467.0	3682.3
10	5847.5	2457.1	10	6610.6	3018.4	10	7489.6	3700.2
20	5864.6	2469.3	20	6630.1	3033.1	20	7512.2	3718.2
30	5881.7	2481.5	30	6649.6	3047.9	30	7534.9	3736.2
40	5898.8	2493.8	40	6669.2	3062.8	40	7557.7	3754.4
50	5916.0	2506.1	50	6688.8	3077.7	50	7580.5	3772.6

Corrections to be Added (T = Tangent. E. = External.)

Int. Angle	Curve 5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
85°	T=.33 E=.128	.66 .259	1.00 .391	1.33 .524	1.68 .657	2.02 .790	2.36 .926	2.70 1.06	3.05 1.20	3.40 1.34	3.77 1.47	4.14 1.62	4.55 1.76	4.89 1.91
90°	T=.36 E=.149	.72 .299	1.09 .450	1.45 .603	1.83 .756	2.20 .910	2.57 1.07	2.94 1.22	3.32 1.38	3.70 1.54	4.10 1.70	4.50 1.87	4.91 2.03	5.32 2.20
95°	T=.39 E=.174	.79 .350	1.19 .522	1.55 .706	2.00 .985	2.40 1.06	2.80 1.25	3.20 1.43	3.61 1.62	4.02 1.80	4.49 1.99	4.98 2.18	5.38 2.38	5.83 2.58
100°	T=.43 E=.200	.86 .401	1.30 .604	1.74 .809	2.18 1.01	2.62 1.22	3.06 1.43	3.50 1.64	3.95 1.85	4.40 2.06	4.88 2.28	5.37 2.50	5.85 2.73	6.34 2.96
105°	T=.46 E=.230	.94 .470	1.42 .700	1.90 .938	2.38 1.17	2.87 1.42	3.34 1.65	3.84 1.90	4.35 2.14	4.84 2.39	5.35 2.64	5.87 2.90	6.40 3.16	6.93 3.41

Table I. — Tangents and Externals to a 1° Curve.
Chord = 100 ft.

Int. Angle	Tangent	External	Int. Angle	Tangent	External	Int. Angle	Tangent	External
106°	7603.5	3791.0	**111°**	8336.7	4386.1	**116°**	9169.4	5082.7
10′	7626.6	3809.4	10′	8362.7	4407.6	10′	9199.1	5107.9
20	7649.7	3827.9	20	8388.9	4429.2	20	9229.0	5133.3
30	7672.9	3846.5	30	8415.1	4450.9	30	9259.0	5158.8
40	7696.3	3865.2	40	8441.5	4472.7	40	9289.2	5184.5
50	7719.7	3884.0	50	8468.0	4494.6	50	9319.5	5210.3
107	7743.2	3902.9	**112**	8494.6	4516.6	**117**	9349.9	5236.2
10	7766.8	3921.9	10	8521.3	4538.8	10	9380.5	5262.3
20	7790.5	3940.9	20	8548.1	4561.1	20	9411.3	5288.6
30	7814.3	3960.1	30	8575.0	4583.4	30	9442.2	5315.0
40	7838.1	3979.4	40	8602.1	4606.0	40	9473.2	5341.5
50	7862.1	3998.7	50	8629.3	4628.6	50	9504.4	5368.2
108	7886.2	4018.2	**113**	8656.6	4651.3	**118**	9535.7	5395.1
10	7910.4	4037.8	10	8684.0	4674.2	10	9567.2	5422.1
20	7934.6	4057.4	20	8711.5	4697.2	20	9598.9	5449.2
30	7959.0	4077.2	30	8739.2	4720.3	30	9630.7	5476.5
40	7983.5	4097.1	40	8767.0	4743.6	40	9662.6	5504.0
50	8008.0	4117.0	50	8794.9	4766.9	50	9694.7	5531.7
109	8032.7	4137.1	**114**	8822.9	4790.4	**119**	9727.0	5559.4
10	8057.4	4157.3	10	8851.0	4814.1	10	9759.4	5587.4
20	8082.3	4177.5	20	8879.3	4837.8	20	9792.0	5615.5
30	8107.3	4197.9	30	8907.7	4861.7	30	9824.8	5643.8
40	8132.3	4218.4	40	8936.3	4885.7	40	9857.7	5672.2
50	8157.5	4239.0	50	8965.0	4909.9	50	9890.8	5700.9
110	8182.8	4259.7	**115**	8993.8	4934.1	**120**	9924.0	5729.7
10	8208.2	4280.5	10	9022.7	4958.6	10	9957.5	5758.6
20	8233.7	4301.4	20	9051.7	4983.1	20	9991.0	5787.7
30	8259.3	4322.4	30	9080.9	5007.8	30	10025.0	5817.0
40	8285.0	4343.6	40	9110.3	5032.6	40	10059.0	5846.5
50	8310.8	4364.8	50	9139.8	5057.6	50	10093.0	5876.1

Corrections to be Added (T = Tangent. E = External.)

Int. Angle	Curve 5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
100°	T=.43 E=.200	.86 .401	1.30 .604	1.74 .809	2.18 1.01	2.62 1.22	3.06 1.43	3.50 1.64	3.95 1.85	4.40 2.06	4.88 2.28	5.37 2.50	5.85 2.73	6.34 2.96
105°	T=.46 E=.230	.94 .470	1.42 .700	1.90 .938	2.38 1.17	2.87 1.42	3.34 1.65	3.84 1.90	4.35 2.14	4.84 2.39	5.35 2.64	5.87 2.90	6.40 3.16	6.93 3.41
110°	T=.50 E=.260	1.03 .535	1.55 .808	2.08 1.08	2.60 1.36	3.14 1.63	3.66 1.91	4.21 2.19	4.76 2.49	5.31 2.61	5.86 3.05	6.43 3.35	7.01 3.65	7.50 3.95
115°	T=.54 E=.307	1.13 .624	1.70 .939	2.29 1.26	2.86 1.57	3.45 1.89	4.03 2.21	4.63 2.54	5.23 2.87	5.83 3.20	6.44 3.53	7.07 3.88	7.70 4.23	8.35 4.58
120°	T=.61 E=.339	1.25 .720	1.89 1.08	2.52 1.45	3.16 1.82	3.81 2.20	4.44 2.56	5.11 2.95	5.78 3.33	6.44 3.72	7.11 4.10	7.80 4.50	8.51 4.91	9.21 5.32

TABLE II. — Radii, Ordinates and Deflections. Chord = 100 ft.

Deg.	Radius	Mid. Ord.	Tan. Dist.	Def. Dist.	Def. for 1 Ft.	Deg.	Radius	Mid. Ord.	Tan. Dist.	Def. Dist.	Def. for 1 Ft.
	ft.	ft.	ft.	ft.	′		ft.	ft.	ft.	ft.	′
0° 10′	34377.	.036	.145	.291	0.05	7°	819.0	1.528	6.105	12.21	2.10
20	17189.	.073	.291	.582	0.10	20′	781.8	1.600	6.395	12.79	2.20
30	11459.	.109	.436	.873	0.15	30	764.5	1.637	6.540	13.08	2.25
40	8594.4	.145	.582	1.164	0.20	40	747.9	1.673	6.685	13.37	2.30
50	6875.5	.182	.727	1.454	0.25	8	716.8	1.746	6.976	13.95	2.40
1	5729.6	.218	.873	1.745	0.30	20	688.2	1.819	7.266	14.53	2.50
10	4911.2	.255	1.018	2.036	0.35	30	674.7	1.855	7.411	14.82	2.55
20	4297.3	.291	1.164	2.327	0.40	40	661.7	1.892	7.556	15.11	2.60
30	3819.8	.327	1.309	2.618	0.45	9	637.3	1.965	7.846	15.69	2.70
40	3437.9	.364	1.454	2.909	0.50	20	614.6	2.037	8.136	16.27	2.80
50	3125.4	.400	1.600	3.200	0.55	30	603.8	2.074	8.281	16.56	2.85
2	2864.9	.436	1.745	3.490	0.60	40	593.4	2.110	8.426	16.85	2.90
10	2644.6	.473	1.891	3.781	0.65	10	573.7	2.183	8.716	17.43	3.00
20	2455.7	.509	2.036	4.072	0.70	30	546.4	2.292	9.150	18.30	3.15
30	2292.0	.545	2.181	4.363	0.75	11	521.7	2.402	9.585	19.16	3.30
40	2148.8	.582	2.327	4.654	0.80	30	499.1	2.511	10.02	20.04	3.45
50	2022.4	.618	2.472	4.945	0.85	12	478.3	2.620	10.45	20.91	3.60
3	1910.1	.655	2.618	5.235	0.90	30	459.3	2.730	10.89	21.77	3.75
10	1809.6	.691	2.763	5.526	0.95	13	441.7	2.839	11.32	22.64	3.90
20	1719.1	.727	2.908	5.817	1.00	30	425.4	2.949	11.75	23.51	4.05
30	1637.3	.764	3.054	6.108	1.05	14	410.3	3.058	12.18	24.37	4.20
40	1562.9	.800	3.199	6.398	1.10	30	396.2	3.168	12.62	25.24	4.35
50	1495.0	.836	3.345	6.689	1.15	15	383.1	3.277	13.05	26.11	4.50
4	1432.7	.873	3.490	6.980	1.20	30	370.8	3.387	13.49	26.97	4.65
10	1375.4	.909	3.635	7.271	1.25	16	359.3	3.496	13.92	27.84	4.80
20	1322.5	.945	3.718	7.561	1.30	30	348.5	3.606	14.35	28.70	4.95
30	1273.6	.982	3.926	7.852	1.35	17	338.3	3.716	14.78	29.56	5.10
40	1228.1	1.018	4.071	8.143	1.40	18	319.6	3.935	15.64	31.29	5.40
50	1185.8	1.055	4.217	8.433	1.45	19	302.9	4.155	16.51	33.01	5.70
5	1146.3	1.091	4.362	8.724	1.50	20	287.9	4.374	17.37	34.73	6.00
10	1109.3	1.127	4.507	9.014	1.55	21	274.4	4.594	18.22	36.44	6.30
20	1074.7	1.164	4.653	9.305	1.60	22	262.0	4.814	19.08	38.16	6.60
30	1042.1	1.200	4.798	9.596	1.65	23	250.8	5.035	19.94	39.87	6.90
40	1011.5	1.237	4.943	9.886	1.70	24	240.5	5.255	20.79	41.58	7.20
50	982.6	1.273	5.088	10.18	1.75	25	231.0	5.476	21.64	43.28	7.50
6	955.4	1.309	5.234	10.47	1.80	26	222.3	5.697	22.50	44.99	7.80
10	929.6	1.346	5.379	10.76	1.85	27	214.2	5.918	23.35	46.69	8.10
20	905.1	1.382	5.524	11.05	1.90	28	206.7	6.139	24.19	48.38	8.40
30	881.9	1.418	5.669	11.34	1.95	29	199.7	6.360	25.04	50.07	8.70
40	859.9	1.455	5.814	11.63	2.00	30	193.2	6.583	25.88	51.76	9.00

The middle ordinate in inches for any cord of length (C) is equal to .0012 C^2 multiplied by the middle ordinate taken from the above table. Thus, if it desired to bend a 30 ft. rail to fit a 10 degree curve, its middle ordinate should be .0012×900×2.183 or 2.36 inches.

TABLE III. Deflections for Sub Chords for Short Radius Curves.

Degree of Curve	Radius 50	$\frac{\frac{1}{2}\text{ sub chord}}{R}$ = sin of ½ def. angle				Length of arc for 100 ft.
	sin. ½ def. ang.	12.5 Ft.	15 Ft.	20 Ft.	25 Ft.	
30°	193.18	1° 51′	2° 17′	2° 58′	3° 43′	101.15
32°	181.39	1° 59′	2° 25′	3° 10′	3° 58′	101.33
34°	171.01	2° 06′	2° 33′	3° 21′	4° 12′	101.48
36°	161.80	2° 13′	2° 41′	3° 33′	4° 26′	101.66
38°	153.58	2° 20′	2° 49′	3° 44′	4° 40′	101.85
40°	146.19	2° 27′	2° 57′	3° 55′	4° 54′	102.06
42°	139.52	2° 34′	3° 05′	4° 07′	5° 08	102.29
44°	133.47	2° 41′	3° 13′	4° 18′	5° 22′	102.53
46°	127.97	2° 48′	3° 21′	4° 29′	5° 36′	102.76
48°	122.92	2° 55′	3° 29′	4° 40′	5° 50′	103.00
50°	118.31	3° 02′	3° 38′	4° 51′	6° 04′	103.24
52°	114.06	3° 09′	3° 46′	5° 02′	6° 17′	103.54
54°	110.11	3° 16′	3° 54′	5° 13′	6° 31′	103.84
56°	106.50	3° 22′	4° 02′	5° 23′	6° 44′	104.14
58°	103.14	3° 29′	4° 10′	5° 34′	6° 57′	104.43
60°	100.00	3° 35′	4° 18′	5° 44′	7° 11′	104.72

CURVE FORMULAS

$T = R \tan \frac{1}{2} I$

$T = \frac{50 \tan \frac{1}{2} I}{\text{Sin. } \frac{1}{2} D}$

$\text{Sin. } \frac{1}{2} D = \frac{50}{R}$

$\text{Sin. } \frac{1}{2} D = \frac{50 \tan \frac{1}{2} I}{T}$

$R = T \cot. \frac{1}{2} I$

$R = \frac{50}{\text{Sin. } \frac{1}{2} D}$

$E = R \text{ ex. sec } \frac{1}{2} I$

$E = T \tan \frac{1}{4} I$

$\text{Chord def.} = \frac{\text{chord}^2}{R}$

$\text{No. chords} = \frac{I}{D}$

$\text{Tan. def.} = \frac{1}{2} \text{chord def.}$

The square of any distance, divided by twice the radius, will equal the distance from tangent to curve, very nearly.

To find angle for a given distance and deflection.

Rule 1. Multiply the given distance by .01745 (def. for 1° for 1 ft. see Table II.), and divide given deflection by the product.

Rule 2. Multiply given deflection by 57.3, and divide the product by the given distance.

To find deflection for a given angle and distance. Multiply the angle by .01745, and the product by the distance.

GENERAL DATA

RIGHT ANGLE TRIANGLES. Square the altitude, divide by twice the base. Add quotient to base for hypotenuse.

Given Base 100, Alt. $10.10^2 \div 200 = .5$. $100 + .5 = 100.5$ hyp.

Given Hyp. 100, Alt. $25.25^2 \div 200 = 3.125$. $100 - 3.125 = 96.875$ = Base.

Error in first example, .002; in last, .045.

To find Tons of Rail in one mile of track: multiply weight per yard by 11, and divide by 7.

LEVELING. The correction for curvature and refraction, in feet and decimals of feet is equal to $0.574d^2$, where d is the distance in miles. The correction for curvature alone is closely, $\frac{2}{3}d^2$. The combined correction is negative.

PROBABLE ERROR. If d_1, d_2, d_3, etc. are the discrepancies of various results from the mean, and if Σd^2 = the sum of the squares of these differences and n = the number of observations, then the probable error of the mean =

$$\pm 0.6745 \sqrt{\frac{\Sigma d^2}{n(n-1)}}$$

SOLAR EPHEMERIS. Attention is called to the Solar Ephemeris for the current year, published by Keuffel & Esser Co., and furnished upon request. This handy booklet, 3¾x6 in., has about 190 pages of data very useful to the Surveyor; such as the adjustments of transits, levels and solar attachments; directions and tables for determining the meridian and the latitude from observations on the sun and Polaris; stadia measurements; magnetic declination; arithmetic constants, etc.

TABLE IV.—Minutes in Decimals of a Degree.

1′	.0167	11′	.1833	21′	.3500	31′	.5167	41′	.6833	51′	.8500
2	.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
3	.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
4	.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
5	.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
6	.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
7	.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
8	.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
9	.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
10	.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

TABLE V.—Inches in Decimals of a Foot.

1-16	3-32	⅛	3-16	¼	5-16	⅜	½	⅝	¾	⅞
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729
1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

Angle ° ′	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
0	0	0	1.	∞	∞	1.	90
10	.0029	.0029		343.8	343.8	1.	50
20	.0058	.0058		171.9	171.9	.99998	40
30	.0087	.0087		114.6	114.6	.99996	30
40	.0116	.0116	1.0001	85.94	85.94	.99993	20
50	.0145	.0145	1.0001	68.76	68.75	.99989	10
1	.0175	.0175	1.0002	57.30	57.29	.99985	89
10	.0204	.0204	1.0002	49.11	49.10	.99979	50
20	.0233	.0233	1.0003	42.98	42.96	.99973	40
30	.0262	.0262	1.0003	38.20	38.19	.99966	30
40	.0291	.0291	1.0004	34.38	34.37	.99958	20
50	.0320	.0320	1.0005	31.26	31.24	.99949	10
2	.0349	.0349	1.0006	28.65	28.64	.99939	88
10	.0378	.0378	1.0007	26.45	26.43	.99929	50
20	.0407	.0407	1.0008	24.56	24.54	.99917	40
30	.0436	.0437	1.0010	22.93	22.90	.99905	30
40	.0465	.0466	1.0011	21.49	21.47	.99892	20
50	.0494	.0495	1.0012	20.23	20.21	.99878	10
3	.0523	.0524	1.0014	19.11	19.08	.99863	87
10	.0552	.0553	1.0015	18.10	18.07	.99847	50
20	.0581	.0582	1.0017	17.20	17.17	.99831	40
30	.0610	.0612	1.0019	16.38	16.35	.99813	30
40	.0640	.0641	1.0020	15.64	15.60	.99795	20
50	.0669	.0670	1.0022	14.96	14.92	.99776	10
4	.0698	.0699	1.0024	14.34	14.30	.99756	86
10	.0727	.0729	1.0027	13.76	13.73	.99736	50
20	.0756	.0758	1.0029	13.23	13.20	.99714	40
30	.0785	.0787	1.0031	12.75	12.71	.99692	30
40	.0814	.0816	1.0033	12.29	12.25	.99668	20
50	.0843	.0846	1.0036	11.87	11.83	.99644	10
5	.0872	.0875	1.0038	11.47	11.43	.99619	85
10	.0901	.0904	1.0041	11.10	11.06	.99594	50
20	.0929	.0934	1.0043	10.76	10.71	.99567	40
30	.0958	.0963	1.0046	10.43	10.39	.99540	30
40	.0987	.0992	1.0049	10.13	10.08	.99511	20
50	.1016	.1022	1.0052	9.839	9.788	.99482	10
6	.1045	.1051	1.0055	9.567	9.514	.99452	84
10	.1074	.1080	1.0058	9.309	9.255	.99421	50
20	.1103	.1110	1.0061	9.065	9.010	.99390	40
30	.1132	.1139	1.0065	8.834	8.777	.99357	30
40	.1161	.1169	1.0068	8.614	8.556	.99324	20
50	.1190	.1198	1.0072	8.405	8.345	.99290	10
7	.1219	.1228	1.0075	8.206	8.144	.99255	83
10	.1248	.1257	1.0079	8.016	7.953	.99219	50
20	.1276	.1287	1.0082	7.834	7.770	.99182	40
30	.1305	.1317	1.0086	7.661	7.596	.99144	30
40	.1334	.1346	1.0090	7.496	7.429	.99106	20
50	.1363	.1376	1.0094	7.337	7.269	.99067	10
							82 ° ′
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle

Angle ° ′	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
8	.1392	.1405	1.0098	7.185	7.115	.99027	82
10	.1421	.1435	1.0102	7.040	6.968	.98986	50
20	.1449	.1465	1.0107	6.900	6.827	.98944	40
30	.1478	.1495	1.0111	6.766	6.691	.98902	30
40	.1507	.1524	1.0115	6.636	6.561	.98858	20
50	1536	.1554	1.0120	6.512	6.435	.98814	10
9	.1564	.1584	1.0125	6.394	6.314	.98769	81
10	.1593	.1614	1.0129	6.277	6.197	.98723	50
20	.1622	.1644	1.0134	6.166	6.084	.98676	40
30	.1650	.1673	1.0139	6.059	5.976	.98629	30
40	.1679	.1703	1.0144	5.955	5.871	.98580	20
50	.1708	.1733	1.0149	5.855	5.769	.98531	10
10	.1736	.1763	1.0154	5.759	5.671	.98481	80
10	.1765	.1793	1.0160	5.665	5.576	.98430	50
20	.1794	.1823	1.0165	5.575	5.485	.98378	40
30	.1822	.1853	1.0170	5.488	5.396	.98325	30
40	.1851	.1883	1.0176	5.403	5.309	.98272	20
50	.1880	.1914	1.0181	5.320	5.226	.98218	10
11	.1908	.1944	1.0187	5.241	5.145	.98163	79
10	.1937	.1974	1.0193	5.164	5.066	.98107	50
20	.1965	.2004	1.0199	5.089	4.989	.98050	40
30	.1994	.2035	1.0205	5.016	4.915	.97992	30
40	.2022	.2065	1.0211	4.945	4.843	.97934	20
50	.2051	.2095	1.0217	4.877	4.773	.97875	10
12	.2079	.2126	1.0223	4.810	4.705	.97815	78
10	.2108	.2156	1.0230	4.745	4.638	.97754	50
20	.2136	.2186	1.0236	4.682	4.574	.97692	40
30	.2164	.2217	1.0243	4.620	4.511	.97630	30
40	.2193	.2247	1.0249	4.560	4.449	.97566	20
50	.2221	.2278	1.0256	4.502	4.390	.97502	10
13	.2250	.2309	1.0263	4.445	4.331	.97437	77
10	.2278	.2339	1.0270	4.390	4.275	.97371	50
20	.2306	.2370	1.0277	4.336	4.219	.97304	40
30	.2334	.2401	1.0284	4.284	4.165	.97237	30
40	.2363	.2432	1.0291	4.232	4.113	.97169	20
50	.2391	.2462	1.0299	4.182	4.061	.97100	10
14	.2419	.2493	1.0306	4.133	4.011	.97030	76
10	.2447	.2524	1.0314	4.086	3.962	.96959	50
20	.2476	.2555	1.0321	4.039	3.914	.96887	40
30	.2504	.2586	1.0329	3.994	3.867	.96815	30
40	.2532	.2617	1.0337	3.949	3.821	.96742	20
50	.2560	.2648	1.0345	3.906	3.776	.96667	10
15	.2588	.2679	1.0353	3.864	3.732	.96593	75
10	.2616	.2711	1.0361	3.822	3.689	.96517	50
20	.2644	.2742	1.0369	3.782	3.647	.96440	40
30	.2672	.2773	1.0377	3.742	3.606	.96363	30
40	.2700	.2805	1.0386	3.703	3.566	.96285	20
50	.2728	.2836	1.0394	3.665	3.526	.96206	10
							74 ° ′
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle

Angle ° ′	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
16	.2756	.2867	1.0403	3.623	3.487	.96126	74
10	.2784	.2899	1.0412	3.592	3.450	.96046	50
20	.2812	.2931	1.0423	3.556	3.412	.95964	40
30	.2840	.2962	1.0429	3.521	3.376	.95882	30
40	.2868	.2994	1.0438	3.487	3.340	.95799	20
50	.2896	.3026	1.0448	3.453	3.305	.95715	10
17	.2924	.3057	1.0457	3.420	3.271	.95630	73
10	.2952	.3089	1.0466	3.388	3.237	.95545	50
20	.2979	.3121	1.0476	3.357	3.204	.95459	40
30	.3007	.3153	1.0485	3.326	3.172	.95372	30
40	.3035	.3185	1.0495	3.295	3.140	.95284	20
50	.3062	.3217	1.0505	3.265	3.108	.95195	10
18	.3090	.3249	1.0515	3.236	3.078	.95106	72
10	.3118	.3281	1.0525	3.207	3.048	.95015	50
20	.3145	.3314	1.0535	3.179	3.018	.94924	40
30	.3173	.3346	1.0545	3.152	2.989	.94832	30
40	.3201	.3378	1.0555	3.124	2.960	.94740	20
50	.3228	.3411	1.0566	3.098	2.932	.94646	10
19	.3256	.3443	1.0576	3.072	2.904	.94552	71
10	.3283	.3476	1.0587	3.046	2.877	.94457	50
20	.3311	.3508	1.0598	3.020	2.850	.94361	40
30	.3338	.3541	1.0608	2.996	2.824	.94264	30
40	.3365	.3574	1.0619	2.971	2.798	.94167	20
50	.3393	.3607	1.0631	2.947	2.773	.94068	10
20	.2420	.3640	1.0642	2.924	2.747	.93969	70
10	.3448	.3673	1.0653	2.900	2.723	.93869	50
20	.3475	.3706	1.0665	2.878	2.699	.93769	40
30	.3502	.3739	1.0676	2.856	2.675	.93667	30
40	.3529	.3772	1.0688	2.833	2.651	.93565	20
50	.3557	.3805	1.0700	2.811	2.628	.93462	10
21	.3584	.3839	1.0711	2.790	2.605	.93358	69
10	.3611	.3872	1.0723	2.769	2.583	.93253	50
20	.3638	.3906	1.0736	2.749	2.560	.93148	40
30	.3665	.3939	1.0748	2.729	2.539	.93042	30
40	.3692	.3973	1.0760	2.709	2.517	.92935	20
50	.3719	.4006	1.0773	2.689	2.496	.92827	10
22	.3746	.4040	1.0785	2.670	2.475	.92718	68
10	.3773	.4074	1.0798	2.650	2.455	.92609	50
20	.3800	.4108	1.0811	2.632	2.434	.92499	40
30	.3827	.4142	1.0824	2.613	2.414	.92388	30
40	.3854	.4176	1.0837	2.595	2.394	.92276	20
50	.3881	.4210	1.0850	2.577	2.375	.92164	10
23	.3907	.4245	1.0864	2.559	2.356	.92050	67
10	.3934	.4279	1.0877	2.542	2.337	.91936	50
20	.3961	.4314	1.0891	2.525	2.318	.91822	40
30	.3987	.4348	1.0904	2.508	2.300	.91706	30
40	.4014	.4383	1.0918	2.491	2.282	.91590	20
50	.4041	.4417	1.0932	2.475	2.264	.91472	10
							66 ° ′
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle

Angle ° ′	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
24	.4067	.4452	1.0946	2.459	2.246	.91355	66
10	.4094	.4487	1.0961	2.443	2.229	.91236	50
20	.4120	.4522	1.0975	2.427	2.211	.91116	40
30	.4147	.4557	1.0989	2.411	2.194	.90996	30
40	.4173	.4592	1.1004	2.396	2.177	.90875	20
50	.4200	.4628	1.1019	2.381	2.161	.90753	10
25	.4226	.4663	1.1034	2.366	2.145	.90631	65
10	.4253	.4699	1.1049	2.351	2.128	.90507	50
20	.4279	.4734	1.1064	2.337	2.112	.90383	40
30	.4305	.4770	1.1079	2.323	2.097	.90259	30
40	.4331	.4806	1.1095	2.309	2.081	.90133	20
50	.4358	.4841	1.1110	2.295	2.066	.90007	10
26	.4384	.4877	1.1126	2.281	2.050	.89879	64
10	.4410	.4913	1.1142	2.268	2.035	.89752	50
20	.4436	.4950	1.1158	2.254	2.020	.89623	40
30	.4462	.4986	1.1174	2.241	2.006	.89493	30
40	.4488	.5022	1.1190	2.228	1.991	.89363	20
50	.4514	.5059	1.1207	2.215	1.977	.89232	10
27	.4540	.5095	1.1223	2.203	1.963	.89101	63
10	.4566	.5132	1.1240	2.190	1.949	.88968	50
20	.4592	.5169	1.1257	2.178	1.935	.88835	40
30	.4617	.5206	1.1274	2.166	1.921	.88701	30
40	.4643	.5243	1.1291	2.154	1.907	.88566	20
50	.4669	.5280	1.1308	2.142	1.894	.88431	10
28	.4695	.5317	1.1326	2.130	1.881	.88295	62
10	.4720	.5354	1.1343	2.119	1.868	.88158	50
20	.4746	.5392	1.1361	2.107	1.855	.88020	40
30	.4772	.5430	1.1379	2.096	1.842	.87882	30
40	.4797	.5467	1.1397	2.085	1.829	.87743	20
50	.4823	.5505	1.1415	2.073	1.816	.87603	10
29	.4848	.5543	1.1434	2.063	1.804	.87462	61
10	.4874	.5581	1.1452	2.052	1.792	.87321	50
20	.4899	.5619	1.1471	2.041	1.780	.87178	40
30	.4924	.5658	1.1490	2.031	1.767	.87036	30
40	.4950	.5696	1.1509	2.020	1.756	.86892	20
50	.4975	.5735	1.1528	2.010	1.744	.86748	10
30	.5000	.5774	1.1547	2.000	1.732	.86603	60
10	.5025	.5812	1.1566	1.990	1.720	.86457	50
20	.5050	.5851	1.1586	1.980	1.709	.86310	40
30	.5075	.5890	1.1606	1.970	1.698	.86163	30
40	.5100	.5930	1.1626	1.961	1.686	.86015	20
50	.5125	.5969	1.1646	1.951	1.675	.85866	10
31	.5150	.6009	1.1666	1.942	1.664	.85717	59
10	.5175	.6048	1.1687	1.932	1.653	.85567	50
20	.5200	.6088	1.1707	1.923	1.643	.85416	40
30	.5225	.6128	1.1728	1.914	1.632	.85264	30
40	.5250	.6168	1.1749	1.905	1.621	.85112	20
50	.5275	.6208	1.1770	1.896	1.611	.84959	10
							58 °
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle

Angle ° ′	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	° ′
32	.5299	.6249	1.1792	1.887	1.600	.84805	58
10	.5324	.6289	1.1813	1.878	1.590	.84650	50
20	.5348	.6330	1.1835	1.870	1.580	.84495	40
30	.5373	.6371	1.1857	1.861	1.570	.84339	30
40	.5398	.6412	1.1879	1.853	1.560	.84182	20
50	.5422	.6453	1.1901	1.844	1.550	.84025	10
33	.5446	.6494	1.1924	1.836	1.540	.83867	57
10	.5471	.6536	1.1946	1.828	1.530	.83708	50
20	.5495	.6577	1.1969	1.820	1.520	.83549	40
30	.5519	.6619	1.1992	1.812	1.511	.83389	30
40	.5544	.6661	1.2015	1.804	1.501	.83228	20
50	.5568	.6703	1.2039	1.796	1.492	.83066	10
34	.5592	.6745	1.2062	1.788	1.483	.82904	56
10	.5616	.6787	1.2086	1.781	1.473	.82741	50
20	.5640	.6830	1.2110	1.773	1.464	.82577	40
30	.5664	.6873	1.2134	1.766	1.455	.82413	30
40	.5688	.6916	1.2158	1.758	1.446	.82248	20
50	.5712	.6959	1.2183	1.751	1.437	.82082	10
35	.5736	.7002	1.2208	1.743	1.428	.81915	55
10	.5760	.7046	1.2233	1.736	1.419	.81748	50
20	.5783	.7089	1.2258	1.729	1.411	.81580	40
30	.5807	.7133	1.2283	1.722	1.402	.81412	30
40	.5831	.7177	1.2309	1.715	1.393	.81242	20
50	.5854	.7221	1.2335	1.708	1.385	.81072	10
36	.5878	.7265	1.2361	1.701	1.376	.80902	54
10	.5901	.7310	1.2387	1.695	1.368	.80730	50
20	.5925	.7355	1.2413	1.688	1.360	.80558	40
30	.5948	.7400	1.2440	1.681	1.351	.80386	30
40	.5972	.7445	1.2466	1.675	1.343	.80212	20
50	.5995	.7490	1.2494	1.668	1.335	.80038	10
37	.6018	.7536	1.2521	1.662	1.327	.79864	53
10	.6041	.7581	1.2549	1.655	1.319	.79688	50
20	.6065	.7627	1.2577	1.649	1.311	.79512	40
30	.6088	.7673	1.2605	1.643	1.303	.79335	30
40	.6111	.7720	1.2633	1.636	1.295	.79158	20
50	.6134	.7766	1.2661	1.630	1.288	.78980	10
38	.6157	.7813	1.2690	1.624	1.280	.78801	52
10	.6180	.7860	1.2719	1.618	1.272	.78622	50
20	.6202	.7907	1.2748	1.612	1.265	.78442	40
30	.6225	.7954	1.2778	1.606	1.257	.78261	30
40	.6248	.8002	1.2808	1.601	1.250	.78079	20
50	.6271	.8050	1.2838	1.595	1.242	.77897	10
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle

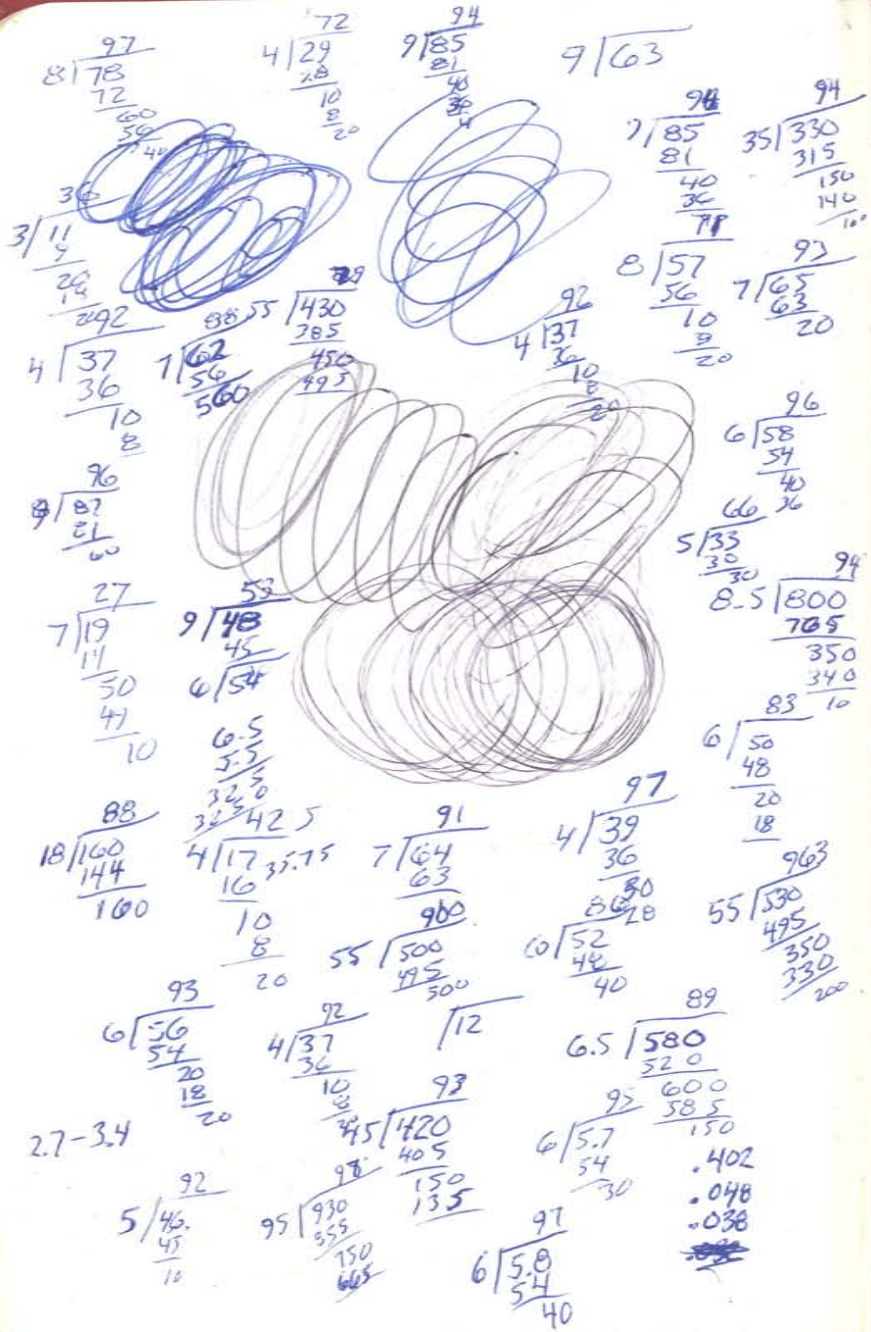
Angle ° ′	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	° ′
39	.6293	.8098	1.2868	1.589	1.235	.77715	51
10	.6316	.8146	1.2898	1.583	1.228	.77531	50
20	.6338	.8195	1.2929	1.578	1.220	.77347	40
30	.6361	.8243	1.2959	1.572	1.213	.77162	30
40	.6383	.8292	1.2991	1.567	1.206	.76977	20
50	.6406	.8342	1.3022	1.561	1.199	.76791	10
40	.6428	.8391	1.3054	1.556	1.192	.76604	50
10	.6450	.8441	1.3086	1.550	1.185	.76417	50
20	.6472	.8491	1.3118	1.545	1.178	.76229	40
30	.6494	.8541	1.3151	1.540	1.171	.76041	30
40	.6517	.8591	1.3184	1.535	1.164	.75851	20
50	.6539	.8642	1.3217	1.529	1.157	.75661	10
41	.6561	.8693	1.3251	1.524	1.150	.75471	49
10	.6583	.8744	1.3284	1.519	1.144	.75280	50
20	.6604	.8796	1.3318	1.514	1.137	.75088	40
30	.6626	.8847	1.3352	1.509	1.130	.74896	30
40	.6648	.8899	1.3386	1.504	1.124	.74703	20
50	.6670	.8952	1.3421	1.499	1.117	.74509	10
42	.6691	.9004	1.3456	1.494	1.111	.74314	48
10	.6713	.9057	1.3492	1.490	1.104	.74120	50
20	.6734	.9110	1.3527	1.485	1.098	.73924	40
30	.6756	.9163	1.3563	1.480	1.091	.73728	30
40	.6777	.9217	1.3600	1.476	1.085	.73531	20
50	.6799	.9271	1.3636	1.471	1.079	.73333	10
43	.6820	.9325	1.3673	1.466	1.072	.73135	47
10	.6841	.9380	1.3711	1.462	1.066	.72937	50
20	.6862	.9435	1.3748	1.457	1.060	.72737	40
30	.6884	.9490	1.3786	1.453	1.054	.72537	30
40	.6905	.9545	1.3824	1.448	1.048	.72337	20
50	.6926	.9601	1.3863	1.444	1.042	.72136	10
44	.6947	.9657	1.3902	1.440	1.036	.71934	46
10	.6967	.9713	1.3941	1.435	1.030	.71732	50
20	.6988	.9770	1.3980	1.431	1.024	.71529	40
30	.7009	.9827	1.4020	1.427	1.018	.71325	30
40	.7030	.9884	1.4061	1.422	1.012	.71121	20
50	.7050	.9942	1.4101	1.418	1.006	.70916	10
	.7071	1.	1.414	1.414	1.	.70711	45
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle

Picture of Paiute Core @ 196'; Hole 2; 9-84 (2)
~~[illegible]~~ Red Qtz + hem + Py + Adularia veining that has been brecciated. The surrounding rock was strongly silica flooded. Pre-existing yellow-brown fault gouge has been strongly silicified. Wall rock is bleached, mod. argill. welded lithic tuff of latitic composition, from the lower unit of the Hartford Hill Rhyolite.

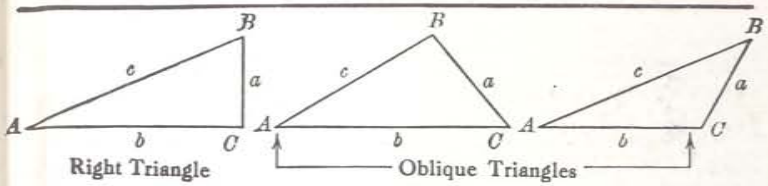
(2) Picture of Paiute Core @ 42.0'; Hole 5, 9-84
Olive green str. argill, mod. propylit., wkly pyritic welded lithic tuff with Qtz stk wk veining

(1) Picture of Paiute Core @ 48.0'; Hole 5 9-84
Bright Bluish-green str. propylitiz., mod. pyritic silica flooded welded lithic tuff with mod. Qtz veining in it.

(1) Picture at 52.0'; Hole no. 5
gray-green lithic tuff w/ mod. Qtz veining and Clear bladed barite Xtls filling vug in Qtz vein.



TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

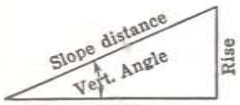
For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

Given	Required	
a, b	A, B, c	$\tan A = \frac{a}{b} = \cot B,\ c = \sqrt{a^2 + b^2} = a\sqrt{1 + \frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B,\ b = \sqrt{(c+a)(c-a)} = c\sqrt{1 - \frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90° - A,\ b = a \cot A,\ c = \frac{a}{\sin A}.$
A, b	B, a, c	$B = 90° - A,\ a = b \tan A,\ c = \frac{b}{\cos A}.$
A, c	B, a, b	$B = 90° - A,\ a = c \sin A,\ b = c \cos A,$

Solution of Oblique Triangles

Given	Required	
A, B, a	b, c, C	$b = \frac{a \sin B}{\sin A},\ C = 180° - (A + B),\ c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a},\ C = 180° - (A + B),\ c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180° - C,\ \tan \frac{1}{2}(A - B) = \frac{(a-b) \tan \frac{1}{2}(A+B)}{a + b},$ $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a+b+c}{2},\ \sin \frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{b\,c}},$ $\sin \frac{1}{2}B = \sqrt{\frac{(s-a)(s-c)}{a\,c}},\ C = 180° - (A+B)$
a, b, c	Area	$s = \frac{a+b+c}{2},\ \text{area} = \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	$\text{area} = \frac{b\,c \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = 5° 10′. From Table, Page IX. cos 5° 10′ = .9959. Horizontal distance = 319.4 × .9959 = 318.09 ft. Horizontal distance also = Slope distance minus slope distance times (1 — cosine of vertical angle). With the same figures as in the preceding example, the following result is obtained. Cosine 5° 10′ = .9959. 1 — .9959 = .0041. 319.4 × .0041 = 1.31. 319.4 — 1.31 = 318.09 ft.

When the rise is known, the horizontal distance is approximately:—the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance $= 302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.

Robert
Luga

Computer Designations For Panite Samples

FIELD 3

1 Rock Chip	4 Drilling
2 Soil	5 Stream sediments
3 Vegetation	6 Fluid inclusion

FIELD 4

1 Dump/adit/pit	6 Duplicates
2 Pyritic	7 Orientation
3 Non Pyritic	8 Recon
4 <20 mesh	9 Standard
5 Heavy mineral concentrate	10 Rerun

Field 5

1 Purple	4 Red
2 Bleached	5 White
3 Gray	6 Green

FIELD 6

1 Silicic
2 Argillic
3 Propylitic
4 Silicic & Argillic
9 Vuggy Silica
10 Barite
11 Weakly Qzt veining
12 Moderate Qzt veining
13 Strong Qzt veining
14 Jarosite stain

FIELD 7

1 Welded	5 Qzt + Pyritic
2 Lapilli	6 Calcite VEINED
3 lithic	7 GOETHITE-STAINED
4 Qzt. veining	8 WELDED / Lithic

FIELD 8

1 LOWER HATTFORD HILL Fm
2 MIDDLE HATTFORD HILL Fm
3 UPPER HATTFORD HILL Fm
4 Pyrymid Fm
5 Stockwork - Stringers - Breccia

84001 PR

DN 24 GC

Agillaria
Caledonia
Caledony

Rock chip Samples Paiute Hill

Friday 22 June

84001PRØ-63125

Outcrop located on the S boundary of the claim. Rock is lapilli with felsic fragments. A moderate amount of qtz veins & veinlets are present in the rock. Rock is green in color. moderately fractured. The channel sample is close to 4½ ft. Sample 2 is to continue where sample 1 ended. Rock shows propylytic alteration.

84002PRØ-63125

Outcrop is next to sample 001. Description is identical to sample 001. Celadonite present.

84005PRØ-63125

Outcrop is near previous samples. It contain quartz veins and is moderately propylitized. Iron oxide present. Area is moderately veined with veins ranging from <1mm to 2cm in width. (cross cut veins). Celadonite present.

Rock Chip Samples Paiute Hill

Monday 25 Jun 84

84007PRØ-63125

Outcrop near previous samples (Same outcrop). The rock is a volcanic lapilli, propylitized contains a moderate amount of quartz veins. These are from fine veinlets to a 5 cm qtz. vein. Rock has white phenocryst.

84008PRØ-63125

Rock description similar to 84007PR. Veinlets are a bit more common, but still in the moderate category. Rock highly silicified. Width 3ft.

84012PRØ-63125

Outcrop above previous samples. Veins & veinlets present (moderate amount). Rock is propylitized. Volcanic lapilli with 20% white phenocryst (probably sanidine, feldspar). Outcrop extends approx. 5' wide.

84017PRØ-63125

Outcrop is weakly silicified. Many veins present of moderate size (1cm thick, 1 mtr long) Veins are drusy qtz. Weathering has created vugs on surface of lapilli. Some propylitic alteration

Pointe Hill Tuesday 26 June

84018PRØ-63125

Outcrop is moderately veined (veins drusy Qtz.) Propylitic alteration is moderate. The rock a lapilli with white phenocryst (fspar) The phenos are up to 2cm. in diameter. Rock is green. Veins white. Fe stained.

84020PRØ-63125

Outcrop is moderately veined (veins drusy qtz). Outcrop is highly weather on the surface. Rock is green lapilli with small white phenocryst. Veins are drusy qtz and are 1cm and less in thickness.

84023PRØ-63125

Outcrop is moderately veined. Veins are drusy qtz and vary in thickness ≤1cm. The rock is green lapilli w/ white phenos. Some propylitic alteration and Fe-staine.

Wednesday 27 June

84025PRØ-63125

Outcrop is moderately veined. Veins are drusy qtz. Rock description is same as previous.

84026PRØ-63125

Outcrop is propylitized and description is analogous to that of previous samples. Veining is noticeably strong but not ≥25%

84029PRØ-63125

Outcrop show high amount of Fe oxidation on surface and moderate veining. Moderate propylitic alteration on green lapilli. Same rock as previous samples

Thursday 28 June 84

84032PRØ-63125
Outcrop moderately veined. Some propylitic alteration. Veins a <1cm in width. Drazy qtz veins. Same general appearance as previous samples apply to this.

84033 PRØ-63125
Outcrop. moderately veined. Propylitic alteration. Drazy veinlets. Veining is approx. 10% - 15%. Rock is green lapilli.

New channel Outcrop Section

84034PRØ-31125 (New outcrop area)
Outcrop moderate veining with veins approx 15-20% of rock. Veins are 2cm and less in thickness. The rock is highly silicified. Some propylitic alteration, Fe staining & some jarosite. The rock is also a crackle breccia on the east portion of the sample.

Friday 29 June

84038PRØ-63135
Rock is green, propylitic lapilli. It is strongly veined rock. Veins, veinlets are quartz and mostly clear qtz. Drazy qtz. is present. Veins are up to 3cm in width. Some brown veins are present. Lapilli has white phenos in fine grained green matrix.

84039PRØ-63125
Rock is green lapilli, moderately veined. Drazy & clear qtz veins. Some argillic alteration near veins. Some propylitic alteration.

84040PRØ-23125
Rock is moderately silicified, moderately veined and slightly propylitic. The quartz veins are drazy and moderately vuggy with limonite and goethite staining. The rock is crosscut with qtz veins. The rock is mostly lapilli.

Paiute Hill

Rock Chip Channel Sample Monday, 2, July

84043PRØ-63125

Outcrop is moderately veined. Veins are druzy qtz. and up to 2 cm wide. Rock is a lapilli with moderate propylitic alteration and many small veinlets cross-cutting the rock. Some jarosite stain, Fe stain and goethite stains. White pheno is lapilli are up to 1 cm wide.

84046PRØ-63125

Outcrop is weakly to moderately veined. Veins are druzy qtz. and up to 2cm wide. Most veins are veinlets 1-2mm wide. Outcrop show argillic alteration and Fe staining. Vugs are present in veins.

84049PRØ-31115

Outcrop weakly veined and moderately iron stained. Veinlets are qtz < 1mm wide. Outcrop show very little propylitic alteration. Shows very small amount of veining. Looks like it has undergone very little alteration.

84053PRØ-32115

Outcrop is weakly to moderately veined. Qtz veinlet are <1mm wide. Rock is highly fractured and contains a portion of crackle breccia. The rock is highly argillic and iron stained.

Paiute

Rock chip channel Tuesday 3, July 84

84060PRØ-32115

Outcrop is facing little Nixon. The rock is moderately altered, weakly veined with qtz veinlets. Small amount of propylitic alteration, some vug, iron staining. Rock is lapilli.

84061PRØ-32115

Outcrop is weakly veined with vuggy, druzy qtz. veinlets. Qtz is also clear. The rock has been weakly altered, slightly propylitic, Rock=lapilli. Fe-stained.

Wednesday 4 July

84064PRØ-32115

Outcrop is weakly altered, small amount of qtz. veinlet present. Fe-oxidize. Rock is gray lapilli with "plag." phenos.

84065PRØ-32115

Outcrop is weakly altered. Same as above. It appear we are approaching the upper boundary of the enrichment zone.

84068PRØ-34115

Outcrop weakly altered. Some portions are silicified and very small amount of qtz veining is present. Rock is dominantly white to gray lapilli. Strong iron oxidation. Lichen covered rock.

84069PRØ-34115

Weakly altered rock w/ small amount of qtz veining. Some iron staining and goethite stains. Rock is highly fractured. The rock is mostly lapilli of gray color. Lichen covered rock.

Thursday 5 July

84073PRØ-32115

Outcrop is small and located near top of zone at the south end. The sample is North of 84072PR. The rock is weakly altered, moderately argillic some iron staining. weak qtz veinlets with small amount of vugs. Some "chloric" present.

84077PRØ-31125

Outcrop is at a new location ~100' northwest of previous outcrop sample area. The outcrop is moderately to strongly veined. Qtz veinlets are made up of drugy qtz and show many vugs in the silicic rock. The veins rock show goethite stains and some amount of chloritic minerals.

84078PRØ-32125

Outcrop next to 84077. Rock is similar to previous sample. No change is noticeable.

84079PRØ-32115 Resample of 84032

Outcrop is ~ 40' above sample 84078. The outcrop is moderate to strongly silicified Qtz veinlets are vuggy and strongly Fe oxidize. Rock show very little volcanic texture. Some propylitic alteration. P

Friday 6, July

84083PRØ - 31115

Rock is moderately to strongly silicified. Qzt veins are 5 to 10% of volume. Rock is heavily Fe-stained. Limonite, goethite is present. Outcrop is small and had to be uncovered from its top soil. Outcrop shows some propylitic alteration.

84084PRØ - 61125

Rock is moderately to highly silicified. Moderately propylitic. Shows a moderate amount of qtz veinlets (very small). The rock is lapilli with propylitic alteration and qtz veinlets crosscutting it. The outcrop is very small, low, soil removed to expose rock sampled. Fe-stained, goethite, limonite.

84085PR1 - 31115

Outcrop highly silicyfied! Small drusy qtz veinlets. Iron stained near and on veinlets. Some propylytic alteration

Paiute Rock Chip Recon

MONDAY 9 July 84

84086PR1 - 34115

Rock is moderately to strongly silicified. Drusy qtz veinlets are <10% present. Rock shows moderate iron staining and some argillic alteration. Sample is by 84085 at adit.

84087PRØ - 31125

Rock is moderately silicified. Many qtz veinlets present ≈15%. Iron stained. Minor argillic alteration. Outcrop is just above sample 84085 and 84086.

84088PRØ - 31115

Rock is moderately silicified. Small amount of qtz veinlets present. Drusy qtz show vugs. Rock is moderate to weakly propylitic. Some argillic alteration present and iron stained. The outcrop is 20 feet below 84085 and 84086. It is a boulder 6 feet high and 12 feet wide. Some section are strongly silicified.

Rock chip Sample
Recon Paiute Hills Tuesday 10 July

84089PRØ-31115

Rock is moderately silicified. Weakly propylitized and weakly veined. The outcrop contain section of greenish gray color but is predominantly gray. The qtz veins are small drusy qtz with iron stained cavities. Rock show some argillic alteration. The outcrop is located next to 84088PR, just Northwest of saddle we normally parked at. Rock is lapilli.

84096PRØ-32115

Rock is weakly veined with very thin veinlets. The rock is weakly altered. Most of the outcrop shows some argillic alteration. The rock is a lapilli. The outcrop is located at the western boundary of delineated section on map. It is fairly large outcrop which extends 200ft from top to bottom along the ridge.

84097PRØ-32115

Outcrop is next to 84096 and it fits same description as 84096.

Wednesday 11, July

84094PRØ-32115

Rock weakly altered. Small amount of veins are present, the upper right half of this sample area has heavy qtz veining. This one zone shows strong alteration. Most of the outcrop is lapilli with argillic alteration. Out is next to 84096.

84095PRØ-32115

Outcrop is next to previous 4 samples. The rock is weakly veined but shows a large vein near the (north) right portion of the sample. Rock is of same type as the previous 5 sample. Lapilli with moderate argillic alteration.

84110PRØ-31115 Same sample as next page
Repeated information

Rock is moderately silicic, some barite xtals present. Weakly veined (qtz veinlets < 5%). Fe stained. Rock located next to 84100PR-84109PR. Qtz veining is decreasing as we move up the hill. Very few qtz veins are seen on these rocks. The rock is the same lapilli described before. No change on the rock is noticeable.

Panuta Rock Chip Recon

Thursday, 12 July

84102PRØ-31115

Rock is weakly veined. Small qtz veinlets present. Rock shows small amount of alteration. The veinlets are seen to trend NW-SE generally. Nearby fault show heavy silicification and trend of fault is N-S, dipping west. Outcrop located north of area facing the main creek which cuts road.

84101PRØ-31115

Rock weakly altered, outcrop located next to 84102PR. Mine adit near by approx. 50 ft. west. Rock is weakly veined with drusy qtz and some "barite?" crystals. The rock is lapilli with white feldspar phenocryst in a gray matrix.

84103PRØ-31115

Rock is weakly to moderately veined. It shows an increase in qtz veinlets as compared to the 2 previous sample. Some qtz xtals of 2-3 cm long are present. Rock is mostly fine lapilli, white phenos in a gray matrix. Similar to description of previous rock

Panuta Rock Chip Recon.

MONDAY, 16 July 84

84106PRØ-31115

Rock is weakly propylitic and weakly veined. Silicification is moderate. Rock is mainly a lapilli with white phenocryst. Phenos are likely feldspars. Rock is moderately Fe-stained. The sample is located at the northwest corner of sample area near 84100 to 84105.

84108PRØ-31115

Outcrop next to previous 3 samples. Rock is lapilli (white phenos of feldspar). Rock is moderately silicic and weakly propylitic. Show Fe oxidation and very weakly veined. Barite xtal on some parts of rock

84110PRØ-31115

Rock moderately silicic, some barite xtals. Weakly veined (qtz veinlets < 5%). Fe-stained. Rock located next to 84100PR to 84109PR. Qtz veining decreases as we sample the outcrops southward or up the hill. The rock is lapilli with white feldspathic phenocryst. Not much change from previous rock descriptions.

Monday, 16 July 84

84111PRØ-31115
Rock is moderately to strongly silicic. a large section shows strong silicification Large qtz vein 2cm thick is present. Some barite xtals present. Iron staining and goethite deposits in some vugs. Rock is lapilli, white feldspathic phenos.

84113PRØ-31115
Rock moderately silicic. Portions of the outcrop were strongly silicic. Qzt veining weak to very weak. Outcrop is weakly propylitic and shows small iron staining. The outcrop is located next to the previous 12 samples 84100 to 84112. The rock is lapilli. Surface is heavily weathered. Small amounts of vugs present in fresh surface.

Tuesday 17 July 84

84115PRØ-31115
Rock is weakly to moderately silicic. Qzt veining is weak with veinlet from .5mm to 5mm thick Rock is mostly lapilli with white feldspathic phenocryst rock is located on the south wall of the north Canyon. It is 10 ft above (south) large desert tree. pine tree.

84116PRØ-31115
Rock is weakly veined. Moderately silicic and argillic. Rock is lapilli, white pheno. xst. Rock outcrop is located next to previous sample number 84115. Rock shows some propylitic alteration

84121PRØ-31115
Outcrop is weakly veined, Moderately silicic and argillic. Rock shows high amount of iron staining. Rock lapilli, white phenos. Some qtz veins contain vugs w/ drusy qtz.

84122PRØ-31115
Rock outcrop is weakly veined. Rock is moderately silicic and argillic. Rock is strong iron stained. Some slickensides visible on small segment of rock. Outcrop shows weak propylitic alteration. Location is next to 121 near north canyon.

Wednesday 18 July

84126PRØ-34115

Rock is weakly to moderately silicic, moderately argillic, weakly veined. Some portion of the rock show brecciated ~~conglo~~ agglomerate rock. Rock is strong in iron staining.

84127PRØ-34115

Weak to moderately silicic and argillic. Rock is similar to previous description. Outcrop location is near the northwest corner of sample area; on the south wall of the north drainage creek. Wall faces the north

84130PRØ-34115

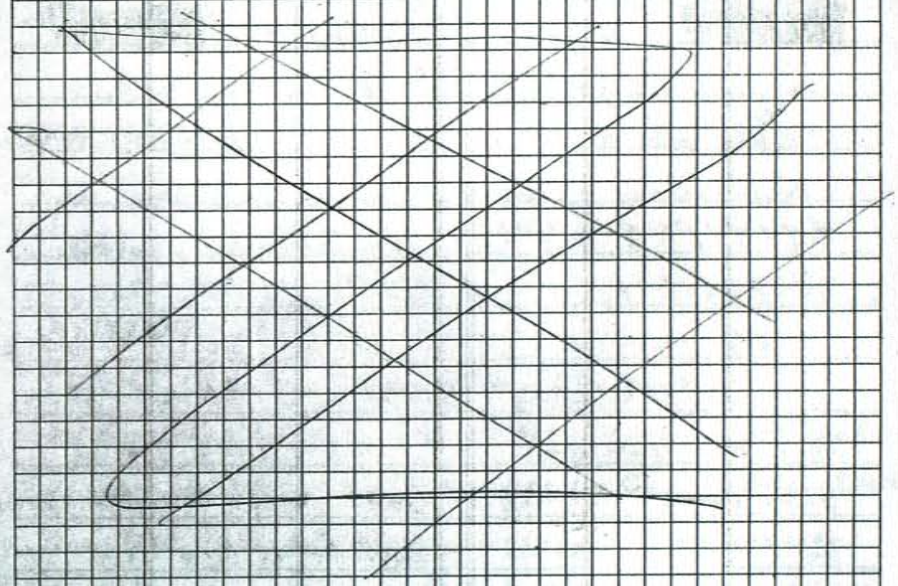
Rock is moderately silicic and show propylitic alteration. Some sections of the sample contained a green matrix lapilli rock with white phenocrysts. Some qtz veinlets present. Rock is strongly iron stained. Outcrop located just 20' above sample 84126 and 84127.

6: (MHP)

Wed July 18

84131PRØ-34115

Rock moderately silicic. Weakly to moderately veined with qtz veinlets. Moderate amount of vugs, some hematite present in the vugs. Veins and veinlets are drusy qtz. Rock is mostly lapilli with white phenocryst. The rock is moderately propylitic showing a greenish color to it. Location of outcrop is northwest corner above adit.



Thursday 19 July

84142 PRØ-63125

Rock outcrop located at Northwest corner of sample area. It is in a continuous uphill channel sample as the previous 42 samples. Rock is a green lapilli with white phenocryst. Rock is moderate vein white qtz veinlets and calcedonic veinlets. Veins are seen with a maroon mineral at the borders and white mineral in the center. Veins are in a strong crosscutting relationship.

84143 PRØ-63125 Resample of [83149 old]. Sample is similar to previous. Rock is adjacent and continuous to previous sample.

84144 PRØ-64115

Rock outcrop is moderate silicic and weakly argillic. Iron stains present. Rock is greenish-gray. Dark iron stained qtz veinlets present but less than the 2 previous sample. Some vugs in qtz veins. Rock show some propylitic alteration.

84145 PRØ-64115

Rock is moderate silicic. The rock is green and has a marked contact where rock is of a light gray color, less silicic and less veined than the 1st half. Rock shows iron staining and some qtz veining. Veinlets are iron stained and filled by the most part with ~~cloudy~~ milky qtz. The rx is mostly a green matrix lapilli, white phenocryst and a shorter section of white lapilli

84146 PRØ-31115

Outcrop is located approx 40 ft east of sample area containing 142 to 145. The rock is a gray lapilli with white phenos. The rock is weakly veined with very fined qtz veinlets. Some qtz vugs present with strong iron staining.

84147 PRØ-31115

Outcrop is above sample 146. The rock is moderately silicic and weakly argillic. The rock is weakly veined (qtz veinlets). Rock: lapilli, white px. The rock is a bit more veined than the previous sample 146. Some euhedral qtz xtal were found measuring about 1cm to 1.5cm long. Strong Fe-staining

Friday 20 July

84147PRØ-31115

Rock outcrop is located about half way up the hill on the NW corner of sampling area. The rock is weakly altered and has very few qtz veinlets in the rock. The predominate rock is lapilli with white phenocryst. Some smaller portions of the rock are a highly weathered and moderately argillic rock which contains darker minerals. The outcrop is difficult to describe due to it small expose and being heavily covered with talus. The exposed rock is heavily fracture

84148PRØ-31115

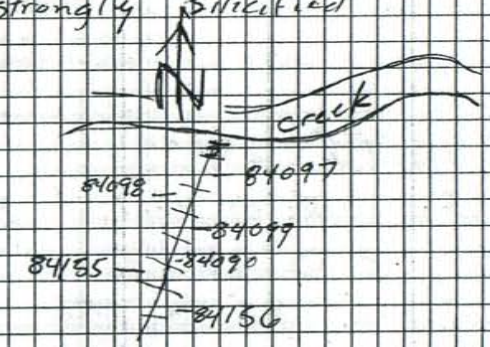
Outcrop located next 84147. The rock is highly fractured. Mostly lapilli, white phenocryst. Some Fe-staining present, some weathered rock and argillic alteration is noticeable at the surface. Small amount of qtz veining is present. Rock is weakly altered.

84149PRØ-34115

Rock is lapilli with white phenocryst. Rock contains barite xtals (small amount). Weak veining. High Fe oxidation. Heavily fractured. Some small amount of argillic alteration.

84155PRØ-61115

Outcrop is located next to sample 84090PR. It continues the sampling uphill. Outcrop is moderately silicified and and contains some thick veinlets of qtz. The veinlets are approx 1cm in thickness and are surrounded by a red mineral which encloses the qtz. Some segments of the outcrop are strongly silicified



MONDAY, 23 July 84

84164PRØ-3225

Rock is very weakly veined Not much alteration is noticeable. The rock is most a fine grain gray matrix surrounding dark phenocryst of 1mm to 1cm in diam. The location of outcrop is about 100 feet east of sample #84090PR sequence. It is near the NW corner of area.

84165PRØ-3125

Sample next to 84164. The rock is similar to sample previously described. No change is noticeable in outcrop. Weakly veined. No veins are seen.

84166PRØ-3225

Rock outcrop is next to sample 84165 The rock is weakly altered and resembles a crackle breccia. Able to see only one qtz vein crosscutting the rock. The vein was approx 1cm in thickness. Rock is highly weathered and shows heavy Fe-Stain.

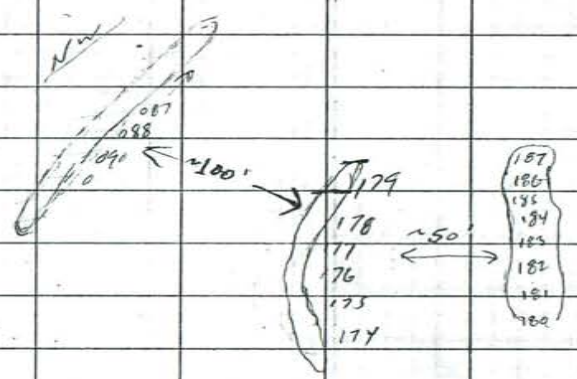
84167PRØ-3225

Outcrop located next to 84166. The rock sample similar to 84166 has one qtz vein cutting across. Weakly altered and highly weathered and fractured rock (resembles crackle breccia). Show heavy iron staining

Tuesday 24 July 84

84176PRØ-31125

Outcrop is highly silicified and moderately veined. The rock is east (approx 100 ft) of the NW corner of sample area. Rock has barite in the yellowish (Jarosite stained?) rock near the right side of sample channel. Many section of the channel rock shows clear silica. Sample rock contains pyrite.



84179PRØ-24115

Rock is located next sample 84178 & 177. The rock is weakly silicic and moderately argillic. Very few veins noticeable. Rock is bleached through most of channel, except for where argillic. Iron staining strong. Rock is lapilli in some section with most bleached matrix.

Wednesday 25 July 84

84182PRØ-34115

Outcrop is located on the North side of sampling area. The outcrop is 50ft east of previous 7 samples. The outcrop is heavily fractured with many angular fragmental rocks over the bedrock. The rock is mostly lapilli and is moderately silicified and weakly veined.

84187PRØ-34115

The outcrop is located below sample 182 and next to sample 186. The rock is weakly to moderately silicic, weakly veined, highly fractured. Rock is a lapilli with feper phenocryst. Many of the phenos are weathered out and other show alteration to clay.

84188PRØ-34115 Description same as 84189.

84189PRØ-34115

Sample is located next to 84188. These two samples are 5 ft channel samples. The outcrop is made up of lapilli. The rock is weakly to moderately silicic. It is moderately argillic and heavily weathered. It is highly fractured. A small number of qtz veins crosscuts the rock. Qtz veinlets are iron stained.

Wednesday 24 July

84190 PRØ - 34115

Rock is located on North corner of sample area next to sample 189 and 188. The rock is lapilli with weakly to moderate silicification. The rock is strongly Fe stained. Weakly qtz veins.

84191 PRØ - 34115

Located next to 190. Lapilli rock. Weak alteration; weak to moderately silicic. Very weakly veined. Rock is strongly Fe-stained. Highly fractured. Rock is similar to 190.

Thursday 26 July 84

84193 PRØ - 34115

Rock outcrop is located in North side of sample area. The rock is lapilli, with white and green phenocryst. The phenocryst are likely to be feldspar and chlorite. The rock shows small amount propylitic alteration and moderate argillic and silicic alteration. Qtz veinlet are present but are very small and most show Fe staining. The channel sample is approx. 5 ft.

84194 PRØ - 34115

The sample is next to 84193 and the rock has no change of physical-chemical properties. The previous description applies to this sample also.

84197 PRØ - 34115

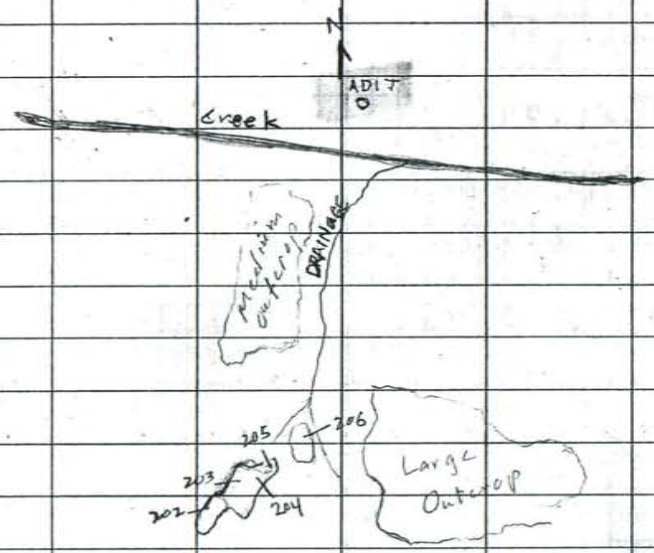
Outcrop is heavily fractured moderately silicic and argillic and weakly veined (small qtz. veinlets) The rock is lapilli and has strong iron staining. Some propylitic alteration is present.

84199 PRØ - 34115

Rock is weakly to moderately veined. The veinlets are iron stained. Some propylitic alteration is present. The rock is lapilli with iron staining. Rock is moderately silicic.

84202PRØ-34115

Rock is moderately to strongly silicic. Strong iron staining. Small amount jarosite. Alteration is moderate. Outcrop has a large vein crosscutting the center of the sample.



Noble
Einstein

Friday 27 July 84

84205-34125

Outcrop is moderately to strongly silicic. Rock has pyrite and is heavily iron stained. Some jarosite staining present. Veining is moderate to strong in some section. Qtz veins are up to 1cm in thickness. Rock is lapilli with small phenocrysts. Rock is highly altered.

84208PRØ-34115

Outcrop strongly silicic. Weakly veined. Pyrite is present in the rock. Small amount of dingy qtz veinlets present and show moderate to strong iron staining. Volcanic texture of lapilli is still noticeable in some portion of the rock. A large fault fracture run vertically through the center of the sample zone. The fracture is heavily weathered.

Office work in the morning.
Packing and preparation of vehicle for Bill's trip
Oil change on Datsun, Refueling Vehicals
Purchase New tire for Wagoneer

Monday 30 July 84

84223 PRØ - 24115

Rock is weakly veined, moderately silicic and moderately argillic. Rock is composed of a greenish-gray clay like matrix with a small percent of white phenocryst. Small veinlets crosscut the rock. Alteration is weak. Iron staining is moderate to weak.

84224 PRØ - 24115

Rock is similar to previous sample. One noticeable difference is the amount of iron staining and a higher number of veinlets present. Some vugs are present with minute euhedral qtz. xtals. Rock is highly fracture and unconsolidated in some sections breaking apart very easily.

84225 PRØ - 24115

Rock is moderately to weakly silicic. Highly fracture. Strong iron staining. Veining is weak. Some vugs are present which show strong iron staining. Rock is volcanic, fine grained gray matrix with with phenocrysts and chlorite "xtals."

Monday, 30 July 84

84226 PRØ - 34125

Rock is moderate to strongly silicic. Veining is moderate. Strong iron staining. Rock has small white phenocryst surrounded by a white to gray fine grained matrix. Some vugs present. Small qtz veinlets are seen throughout most of the sample with some larger veins present at a much small percentage. Rock show moderate to strong fracturing and alteration.

Tuesday, 31 July

84227PRØ-34115

Weakly veined and moderately silicic rock. Qtz veinlet have strong iron staining with small vugs, surfaced covered by druzy qtz. Some areas have goethite, very ~~strong~~ predominant. Rock is lapilli

84228PRØ-34115

Weak veining with moderate silicification. Rock has vugs which contain barite crystals. Some Jarosite is found. One small vein (qtz) stand out due to its thickness of about 1cm. and its length of about 2ft. No other veins similar to this one are present here. The rock is lapilli with white and green phenocryst. Strongly iron stained.

84229PRØ-34115

Rock is weakly veined and moderately silicic. Rock is mostly lapilli. Some sections are strongly silicified. The rock show strong iron staining and the qtz veinlets are also iron stained. Most of the vugs found are covered by druzy qtz.

Tuesday 31 July

84230PRØ-34125

Rock is moderately veined and moderately silicic. Vugs present and are strongly iron stained. Rock is lapilli with white and green phenocryst. Phenos are less than 1cm in diameter.

Wednesday 1 Aug 84

Rock chip sampling Paiute Recon.

84231PRØ-34115

Rock moderately to strongly silicic. Very hard to chip sample. Weakly qtz. Qtz veinlets are strongly iron stained. Rock is lapilli.

84232PRØ-34115

Rock is moderately silicic and is strongly iron stained. Qtz veinlets are few and show strong hematite-goethite staining. Rock is moderately altered from orinally lapilli.

Recon Rock Chip Pointe Wed. 1 Aug.

84233PRØ - 34115

Rock moderate to strongly silicic, weakly argillic. Weak qtz veining. Strong iron staining throughout rock. Rock contains vugs around the veinlet with druzy qtz surface in vugs and strongly iron stained. Rock is lapilli

84234PRØ - 34115

Rock is similar description to 84233PR. Weak qtz veinlets, strong to moderate silicification, weak argillic alteration. Vugs present, heavily iron stained. Rock is lapilli with white phenocryst in a gray matrix. Rock is strongly fractured.

Thursday 2 Aug 84

84236PRØ - 31125

Rock is moderately to strongly silicic. Weakly argillic and weakly propylitic. Qtz veinlet a weak to moderate. Some well define euhedral qtz xtals. Some vein are up to 1cm thick, clear qtz. Rock is lapilli with gray matrix and white phenocryst.

84238PRØ - 64125

Rock moderately to strongly silicic. Weakly argillic and strongly iron stained. Moderately veined qtz veinlets. Rock is lapilli, green matrix white phenocryst.

84241PRØ - 64115

Rock strongly silicic, moderately veined with qtz veinlets strongly iron stained. Rock is mostly lapilli, green matrix with white phenocryst. Hematite staining in around veinlets. Rock is moderately propylitic.

84243PRØ - 64125
Rock is moderately silicic. Veinlet are moderately iron stained. Weak to strong veining. Some Jarosite staining. Propylitic alteration is moderate. The rock is lapilli with green matrix and white phenocryst. Argillic alteration is moderate with moderate iron staining throughout the rock outcrop.

84245PRØ - 34115
Rock is moderately to strongly silicic weakly veined with strong iron stain on veining. Veinlets are drusy qtz with iron staining and some clay deposit in the vugs. Rock contains some Jarositic deposits on surface. Rock is greenish gray lapilli

84248PRØ - 34115
Rock moderately to strongly silicic. Greenish-gray lapilli with with phenocryst. Rock is weakly to moderately veined

84250PRØ - 34115. Rock description is same as 84245 and 248.

Friday 3 Aug 84

84253PRØ - 34115
Rock is moderately silicic and weakly veined. Alteration is weak. Jarosite staining present. Strong iron staining. Rock highly fractured and heavily weathered. Fractures are vertical and horizontal

84255PRØ - 24115.
Rock is moderately silicic and argillic. Strongly iron stained, heavily weathered. Highly fractured with vertical and horizontal orientation. Veining is weak, with one segment containing various thick veinlets. The veinlets are approximately 1cm in thickness and are made up of milky qtz. The rock is not very solid, fractures easily when hit with hammer. Jarosite staining is strong.

84256PRØ - 34115
Rock is moderately to strongly silicic. Channel sample was taken mainly of a strongly silicic dike-like body with runs horizontally across the rock and is approx 6 inches in thickness. Rock is weakly veined and strongly iron-stained. Some jarosite present. Silicic rock is a dark color silica rock, fractures like glass.

Friday, Aug 3, 84

84259PRØ-63125

Rock is moderately silicic and propylitic. Veining is moderate with mostly thin qtz veinlet with iron oxidation on the surface. Iron staining is strong on rock surface. Rock is mostly a green lapilli with white phenocryst.

Wednesday 8 Aug 84

84262PRØ-63125

Rock is moderately silicic and its color is blue green. Rock show some propylitic alteration. The rock is moderately to strongly veined in many sections in general it is moderately veined. Some jarosite is present in rock. Rock is lapilli.

84263PRØ-63125

Rock is moderately silicic and moderately veined. Some jarosite and some propylitic alteration can be found in the rock. The rock is made up mostly of lapilli, green in color with white phenocryst.

84264PRØ-63125 Resample of [redacted]

Rock is moderately silicic and weakly propylitic. Qtz veins and veinlets and easily visible, the rock is moderately veined. Qtz veins are white milky qtz. and are 1cm to 1mm in thickness. Rock is heavily stained with iron.

84267PRØ-63125

Rock is moderately veined and moderately silicic. Strong iron staining. Some pyrite present very small size approx. .5mm diameter (small specks). Veins are 1cm thick and vugs are present and are strongly iron stained. Rock is green lapilli with white phenocryst.

Thursday, Aug 9, 84

84273PRØ-22115 NEW SAMPLE AREA

Rock weakly veined, strongly argillic and weakly silicified. The rock is highly fractured and moderately altered. It has strong bleaching. Outcrop start a new sample area above sample 84164PR.

84274PRØ-24125

Outcrop is moderately silicified and argillic. Rock is bleached. Strong iron staining. Lapilli rock with white phenocryst. Strongly fractured. Large, strongly silicified "dike" crosscutting the rock.

84275PRØ-24115

Rock weakly silicic and moderately argillic. Strong iron staining. Highly fractured lapilli rock, white phenos.

84279PRØ-24115

Rock weakly silicic, moderately argillic - Weak veining. Highly fractured and bleached. Sample is at the uppermost outcrop of the north west section of sampling area. It above sample 84164PR.

Thursday 9 Aug. 84

84280PRØ-24115 New sample area located about 500ft west of drill hole #2 up the hill. Rock is weakly silicic, moderately argillic. High fractured and strong iron staining. Quartz veinlets have small vugs and are strongly Fe stained.

84281PRØ-24115

Rock is weakly silicic and moderately argillic. It is near sample 84280PR. Weakly veined. Strong iron staining. Weak alteration.

84282PRØ-24115

Rock weakly silicic and moderately argillic. Weak veining and weak alteration. Fresh surface is mostly white, volcanic rock (lapilli). Some propylitic alteration is present.

Friday 10 Aug.

Work day was spent cleaning out the Reno storage room. Old sample were discarded all day long. Took several trips to the dumps with the use of a 4' x 12' U Haul trailer. More samples ~~are~~ remain at the warehouse which will be disposed of in the coming week.

Saturday 11 Aug.

84285PRØ-24115
Rock is highly fractured, moderately argillic and moderately silicic. Small amount of veining is present. Rock is strong in iron staining. Druzy qtz veins with small euhedral xtals is seen in some parts.

84289PRØ-24125
Rock is moderately argillic and strongly silicic. A good amount of qtz veins and veinlets are present. Some qtz xtals euhedral in shape of approx 2cm are present in some of the vugs. The are various large vugs in the sample area. Some vugs are almost 2 or 3 inches inside cavity. Rock is strongly iron stained. Some propylitic alteration is present.

84290PRØ-24125
Rock is weakly argillic and silicic. It is moderately veined with small qtz veinlets. High in iron oxidation. Weakly propylitic. Highly fractured. Volcanic texture still apparent indicating weak alteration. Resembles a crackle breccia.

Saturday, 11 Aug 84

84291PRØ-24115
Rock is moderately silicic and argillic. Shows some weak propylitic alteration. Strong iron staining, strongly fractured.

84292PRØ-24115
Rock similar to 84291. Strong iron staining. Moderately silicic and moderately argillic, crackle breccia appearence on surface.

84293PRØ-24115
Strong iron staining. Weakly veined. Moderately silicic. Resembles crackle breccia on exposed surface. Rock is continuous in similarity to the previous 4 samples. Outcrop is very large exposure approximately 100 ft long and heights up to 30 ft above the ground level in some areas.

Sunday 12 Aug 84

84294PRØ-24115
Weakly veined rock. Moderate silicic and moderately argillic. Strong iron staining. Strongly fractured. Small amounts of propylitic alteration. Sample is in same area as previous 6 samples, Next to 84293.

84295PRØ-24115
Rock is next to 84294 and no change is noticeable to previous sample. ~~Small alteration in crosscutting vein. It is propylitic.~~

84296PRØ-24115
Rock is weakly veined. Moderately silicic and moderately argillic. Weakly propylitic. Strong iron staining. Lapilli texture is clearly visible on fresh surface of rock. It shows very little veining.

Sunday, 12 Aug 84

84297 PRØ-24115

Rock is weakly to moderately silicic. Strong iron staining. Weakly silicic and weakly veined. Show some propylitic alteration. Highly fractured rock. Fractures are in a verticle attitude.

84298 PRØ-24115

Weakly silicic and moderately argillic weak veining. Strongly fractured strong iron staining.

84299 PRØ-24115

Weakly to moderately silicic rock. Moderately argillic, strong iron staining. Rock highly fractured. Weakly veined. Some small ~~portio~~ areas show strong silicic alteration and some propylitic alteration.

Jake Brook
Simon & Schuster
Dean Howie & Snoosman
Tape chisel
Reduce clothing supply
Get dark glasses

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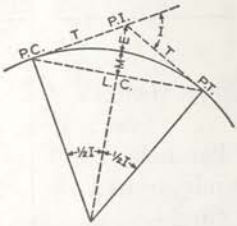
086
(17)

23/7 1475

CURVE AND REDUCTION TABLES

Published by Eugene Dietzgen Co.



CURVE FORMULAS

1. Radius : $R = \dfrac{50}{\sin D/2}$
2. Degree of Curve: $D = 100\dfrac{I}{L}$. Also, $\sin D/2 = \dfrac{50}{R}$
3. Tangent : $T = R \tan \frac{1}{2} I$. Also, $T = \dfrac{T \text{ for } 1^\circ \text{ curve}}{D} + C$.
4. Length of Curve: $L = 100\dfrac{I}{D}$
5. Long Chord : $L.\ C. = 2R \sin \frac{1}{2} I$.
6. Middle Ordinate: $M = R\ (1 - \cos \frac{1}{2} I)$
7. External : $E = \dfrac{R}{\cos \frac{1}{2} I} - R$. Also, $E = T \tan \frac{1}{4} I$.

EXPLANATION AND USE OF TABLES

Given P.I. Sta. 83+40.7, I = 45° 20′ and D = 6°30′ find:

Stations—P. C. = P. I. − T. $T = \dfrac{T \text{ for } 1^\circ \text{ Curve}}{D} + C$. From Tables V and VI $T = \dfrac{2392.8}{6.5} + .197 = 368.32 = 3 + 68.32$. Sta. P. C. = 83+40.7 − (3+68.32) = 79+72.38. P. T. = P. C. + L, and $L = 100\ \dfrac{I}{D} = 100\ \dfrac{45.33}{6.5} = 697.38$ Therefore, P. T. = (79+72.38) + (6+97.38) = 86+69.76.

Offsets—Tangent offsets vary (approximately) directly with D and with the square of the distance. From Table III Tangent Offset for 100 feet = 5.669 feet. Distance = 80 − Sta. P. C. = 27.62. Hence offset $= 5.66 \times \left(\dfrac{27.62}{100}\right)^2 = .432$ ft. Also, square of any distance, divided by twice the radius equals (approximately) the distance from tangent to curve. Thus $(27.62)^2 \div (2 \times 881.95) = .432$ ft.

Deflections—Deflection angle = ½ D for 100 ft., ¼ D for 50 ft., etc. For "X" ft. Deflection Angle (in minutes) = .3 × X × D. For Sta. 80 of above curve Deflection Angle = .3 × 27.62 × 6.5 = 53.86′. Also Deflection Angle = dfl. for 1 ft. from Table III × X = 1.95 × 27.62 = 53.86′. For Sta. 181 Deflection Angle $= 53.86' + \dfrac{6^\circ\ 30'}{2} = 4^\circ\ 8.86'$.

Externals—From Table V for 1° curve, with central angle of 45° 20′, E = 479.6. Therefore, for 6° 30′ curve, $E = \dfrac{479.6}{6.5} +$ Correction from Table VI = 7.378 + .039 = 7.417.

General Equations and Useful Data

	Symbol on Equation	Numerical Value
Area of circle	$\frac{\pi d^2}{4}$	
Area of Sector of Circle (Length of arc = l)	1/2 lr	
Area of Segment of Parabola (app.) (c = chord; m = mid. ord.)	2/3 cm	
Area of Segment of Circle	2/3 cm	
Cubic Feet in 1 Cubic Meter		35.3145
Cubic Inches in 1 Imperial Gallon		277.274
Cubic Inches in 1 U.S. Gallon		231
Feet in 1 Meter		3.2808
Feet in 1 Mile		5280
Gallons (Imperial) in 1 Cubic Foot		6.2321
Gallons (U.S.) in 1 Cubic Foot		7.48
Miles in 1 Kilometer		0.6213
Pounds (Av.) in 1 Kilogram		2.2046
Ratio of Circumference to Diameter	π	3.14159
Reciprocal of π		0.31831
Square Feet in 1 Acre		43,560
Volume of Sphere	$4/3\ \pi r^3$	

Table I.—Minutes in Decimals of a Degree.

1′	.0167	11′	.1833	21′	.3500	31′	.5167	41′	.6833	51′	.8500
2	.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
3	.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
4	.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
5	.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
6	.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
7	.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
8	.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
9	.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
10	.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

Table II.—Inches in Decimals of a Foot.

1/16	3/32	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	7/8
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729
1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

Table III.—Radii, Ordinates and Deflections

Deg.	Radius	Mid. Ord.	Tan Offset	Def. for 1 Foot	Deg.	Radius	Mid. Ord.	Tan Offset	Def. for 1 Foot
0° 10′	34377.5	.036	.145	0.05′	7°	819.02	1.528	6.105	2.10′
20	17188.8	.073	.291	0.10	20	781.84	1.600	6.395	2.20
30	11459.2	.109	.436	0.15	30	764.49	1.637	6.540	2.25
40	8594.42	.145	.582	0.20	40	747.89	1.673	6.685	2.30
50	6875.55	.182	.727	0.25	8	716.78	1.746	6.976	2.40
1	5729.65	.218	.873	0.30	20	688.16	1.819	7.266	2.50
10	4911.15	.255	1.018	0.35	30	674.69	1.855	7.411	2.55
20	4297.28	.291	1.164	0.40	40	661.74	1.892	7.556	2.60
30	3819.83	.327	1.309	0.45	9	637.28	1.965	7.846	2.70
40	3437.87	.364	1.454	0.50	20	614.56	2.037	8.136	2.80
50	3125.36	.400	1.600	0.55	30	603.80	2.074	8.281	2.85
2	2864.93	.436	1.745	0.60	40	593.42	2.110	8.426	2.90
10	2644.58	.473	1.891	0.65	10	573.69	2.183	8.716	3.00
20	2455.70	.509	2.036	0.70	30	546.44	2.292	9.150	3.15
30	2292.01	.545	2.181	0.75	11	521.67	2.402	9.585	3.30
40	2148.79	.582	2.327	0.80	30	499.06	2.511	10.02	3.45
50	2022.41	.618	2.472	0.85	12	478.34	2.620	10.45	3.60
3	1910.08	.655	2.618	0.90	30	459.28	2.730	10.89	3.75
10	1809.57	.691	2.763	0.95	13	441.68	2.839	11.32	3.90
20	1719.12	.727	2.908	1.00	30	425.40	2.949	11.75	4.05
30	1637.28	.764	3.054	1.05	14	410.28	3.058	12.18	4.20
40	1562.88	.800	3.199	1.10	30	396.20	3.168	12.62	4.35
50	1494.95	.836	3.345	1.15	15	383.07	3.277	13.05	4.50
4	1432.69	.873	3.490	1.20	30	370.78	3.387	13.49	4.65
10	1375.40	.909	3.635	1.25	16	359.27	3.496	13.92	4.80
20	1322.53	.945	3.718	1.30	30	348.45	3.606	14.35	4.95
30	1273.57	.982	3.926	1.35	17	338.27	3.716	14.78	5.10
40	1228.11	1.018	4.071	1.40	18	319.62	3.935	15.64	5.40
50	1185.78	1.055	4.217	1.45	19	302.94	4.155	16.51	5.70
5	1146.28	1.091	4.362	1.50	20	287.94	4.374	17.37	6.00
10	1109.33	1.127	4.507	1.55	21	274.37	4.594	18.22	6.30
20	1074.68	1.164	4.653	1.60	22	262.04	4.814	19.08	6.60
30	1042.14	1.200	4.798	1.65	23	250.79	5.035	19.94	6.90
40	1011.51	1.237	4.943	1.70	24	240.49	5.255	20.79	7.20
50	982.64	1.273	5.088	1.75	25	231.01	5.476	21.64	7.50
6	955.37	1.309	5.234	1.80	26	222.27	5.697	22.50	7.80
10	929.57	1.346	5.379	1.85	27	214.18	5.918	23.35	8.10
20	905.13	1.382	5.524	1.90	28	206.68	6.139	24.19	8.40
30	881.95	1.418	5.669	1.95	29	199.70	6.360	25.04	8.70
40	859.92	1.455	5.814	2.00	30	193.18	6.583	25.88	9.00

NOTE. Chord Deflection = 2 times tangent deflection.

Table IV.—Deflections for Sub Chords for Short Radius Curves

Degree of Curve	Radius	Deflection Angles for Sub Chords of Various Lengths				Length of Arc for 100 Ft. Chord
		12.5 Ft.	15 Ft.	20 Ft.	25 Ft.	
30°	193.18	1° 51′	2° 17′	2° 58′	3° 43′	101.15
32°	181.39	1° 59′	2° 25′	3° 10′	3° 58′	101.33
34°	171.01	2° 06′	2° 33′	3° 21′	4° 12′	101.48
36°	161.80	2° 13′	2° 41′	3° 33′	4° 26′	101.66
38°	153.58	2° 20′	2° 49′	3° 44′	4° 40′	101.85
40°	146.19	2° 27′	2° 57′	3° 55′	4° 54′	102.06
42°	139.52	2° 34′	3° 05′	4° 07′	5° 08′	102.29
44°	133.47	2° 41′	3° 13′	4° 18′	5° 22′	102.53
46°	127.97	2° 48′	3° 21′	4° 29′	5° 36′	102.76
48°	122.92	2° 55′	3° 29′	4° 40′	5° 50′	103.00
50°	118.31	3° 02′	3° 38′	4° 51′	6° 04′	103.24
52°	114.06	3° 09′	3° 46′	5° 02′	6° 17′	103.54
54°	110.11	3° 16′	3° 54′	5° 13′	6° 31′	103.84
56°	106.50	3° 22′	4° 02′	5° 23′	6° 44′	104.14
58°	103.14	3° 29′	4° 10′	5° 34′	6° 57′	104.43
60°	100.00	3° 35′	4° 18′	5° 44′	7° 11′	104.72

Table V.—Tangents and Externals to a 1° Curve.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
1°	50.00	.22	11°	551.70	26.50	21°	1061.9	97.57
10′	58.34	.30	10	560.11	27.31	10′	1070.6	99.16
20	66.67	.39	20	568.53	28.14	20	1079.2	100.75
30	75.01	.49	30	576.95	28.97	30	1087.8	102.35
40	83.34	.61	40	585.36	29.82	40	1096.4	103.97
50	91.68	.73	50	593.79	30.68	50	1105.1	105.60
2	100.01	.87	12	602.21	31.56	22	1113.7	107.24
10	108.35	1.02	10	610.64	32.45	10	1122.4	108.90
20	116.68	1.19	20	619.07	33.35	20	1131.0	110.57
30	125.02	1.36	30	627.50	34.26	30	1139.7	112.25
40	133.36	1.55	40	635.93	35.18	40	1148.4	113.95
50	141.70	1.75	50	644.37	36.12	50	1157.0	115.66
3	150.04	1.96	13	652.81	37.07	23	1165.7	117.38
10	158.38	2.19	10	661.25	38.03	10	1174.4	119.12
20	166.72	2.43	20	669.70	39.01	20	1183.1	120.87
30	175.06	2.67	30	678.15	39.99	30	1191.8	122.63
40	183.40	2.93	40	686.60	40.99	40	1200.5	124.41
50	191.74	3.21	50	695.06	42.00	50	1209.2	126.20
4	200.08	3.49	14	703.51	43.03	24	1217.9	128.00
10	208.43	3.79	10	711.97	44.07	10	1226.6	129.82
20	216.77	4.10	20	720.44	45.12	20	1235.3	131.65
30	225.12	4.42	30	728.90	46.18	30	1244.0	133.50
40	233.47	4.76	40	737.37	47.25	40	1252.8	135.35
50	241.81	5.10	50	745.85	48.34	50	1261.5	137.23
5	250.16	5.46	15	754.32	49.44	25	1270.2	139.11
10	258.51	5.83	10	762.80	50.55	10	1279.0	141.01
20	266.86	6.21	20	771.29	51.68	20	1287.7	142.93
30	275.21	6.61	30	779.77	52.89	30	1296.5	144.85
40	283.57	7.01	40	788.26	53.97	40	1305.3	146.79
50	291.92	7.43	50	796.75	55.13	50	1314.0	148.75
6	300.28	7.86	16	805.25	56.31	26	1322.8	150.71
10	308.64	8.31	10	813.75	57.50	10	1331.6	152.69
20	316.99	8.76	20	822.25	58.70	20	1340.4	154.69
30	325.35	9.23	30	830.76	59.91	30	1349.2	156.70
40	333.71	9.71	40	839.27	61.14	40	1358.0	158.72
50	342.08	10.20	50	847.78	62.38	50	1366.8	160.76
7	350.44	10.71	17	856.30	63.63	27	1375.6	162.81
10	358.81	11.22	10	864.82	64.90	10	1384.4	164.86
20	367.17	11.75	20	873.35	66.18	20	1393.2	166.95
30	375.54	12.29	30	881.88	67.47	30	1402.0	169.04
40	383.91	12.85	40	890.41	68.77	40	1410.9	171.15
50	392.28	13.41	50	898.95	70.09	50	1419.7	173.27
8	400.66	13.99	18	907.49	71.42	28	1428.6	175.41
10	409.03	14.58	10	916.03	72.76	10	1437.4	177.55
20	417.41	15.18	20	924.58	74.12	20	1446.3	179.72
30	425.79	15.80	30	933.13	75.49	30	1455.1	181.89
40	434.17	16.43	40	941.69	76.86	40	1464.0	184.08
50	442.55	17.07	50	950.25	78.26	50	1472.9	186.29
9	450.93	17.72	19	958.81	79.67	29	1481.8	188.51
10	459.32	18.38	10	967.38	81.09	10	1490.7	190.74
20	467.71	19.06	20	975.96	82.53	20	1499.6	192.99
30	476.10	19.75	30	984.53	83.97	30	1508.5	195.25
40	484.49	20.45	40	993.12	85.43	40	1517.4	197.53
50	492.88	21.16	50	1001.7	86.90	50	1526.3	199.82
10	501.28	21.89	20	1010.3	88.39	30	1535.3	202.12
10	509.68	22.62	10	1018.9	89.89	10	1544.2	204.44
20	518.08	23.38	20	1027.5	91.40	20	1553.1	206.77
30	526.48	24.14	30	1036.1	92.92	30	1562.1	209.12
40	534.89	24.91	40	1044.7	94.46	40	1571.0	211.48
50	543.29	25.70	50	1053.3	96.01	50	1580.0	213.86

Table V.—Tangents and Externals to a 1° Curve.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
31°	1589.0	216.3	41°	2142.2	387.4	51°	2732.9	618.4
10′	1598.0	218.7	10	2151.7	390.7	10	2743.1	622.8
20	1606.9	221.1	20	2161.2	394.1	20	2753.4	627.2
30	1615.9	223.5	30	2170.8	397.4	30	2763.7	631.7
40	1624.9	226.0	40	2180.3	400.8	40	2773.9	636.2
50	1633.9	228.4	50	2189.9	404.2	50	2784.2	640.7
32	1643.0	230.9	42	2199.4	407.6	52	2794.5	645.2
10	1652.0	233.4	10	2209.0	411.1	10	2804.9	649.7
20	1661.0	235.9	20	2218.6	414.5	20	2815.2	654.3
30	1670.0	238.4	30	2228.1	418.0	30	2825.6	658.8
40	1679.1	241.0	40	2237.7	421.4	40	2835.9	663.4
50	1688.1	243.5	50	2247.3	425.0	50	2846.3	668.0
33	1697.2	246.1	43	2257.0	428.5	53	2856.7	672.7
10	1706.3	248.7	10	2266.6	432.0	10	2867.1	677.3
20	1715.3	251.3	20	2276.2	435.6	20	2877.5	682.0
30	1724.4	253.9	30	2285.9	439.2	30	2888.0	686.7
40	1733.5	256.5	40	2295.6	442.8	40	2898.4	691.4
50	1742.6	259.1	50	2305.2	446.4	50	2908.9	696.1
34	1751.7	261.8	44	2314.9	450.0	54	2919.4	700.9
10	1760.8	264.5	10	2324.6	453.6	10	2929.9	705.7
20	1770.0	267.2	20	2334.3	457.3	20	2940.4	710.5
30	1779.1	269.9	30	2344.1	461.0	30	2951.0	715.3
40	1788.2	272.6	40	2353.8	464.6	40	2961.5	720.1
50	1797.4	275.3	50	2363.5	468.4	50	2972.1	725.0
35	1806.6	278.1	45	2373.3	472.1	55	2982.7	729.9
10	1815.7	280.8	10	2383.1	475.8	10	2993.3	734.8
20	1824.9	283.6	20	2392.8	479.6	20	3003.9	739.7
30	1834.1	286.4	30	2402.6	483.8	30	3014.5	744.6
40	1843.3	289.2	40	2412.4	487.2	40	3025.2	749.6
50	1852.5	292.0	50	2422.3	491.0	50	3035.8	754.6
36	1861.7	294.9	46	2432.1	494.8	56	3046.5	759.6
10	1870.9	297.7	10	2441.9	498.7	10	3057.2	764.6
20	1880.1	300.6	20	2451.8	502.5	20	3067.9	769.7
30	1889.4	303.5	30	2461.7	506.4	30	3078.7	774.7
40	1898.6	306.4	40	2471.5	510.3	40	3089.4	779.8
50	1907.9	309.3	50	2481.4	514.3	50	3100.2	784.9
37	1917.1	312.2	47	2491.3	518.2	57	3110.9	790.1
10	1926.4	315.2	10	2501.2	522.2	10	3121.7	795.2
20	1935.7	318.1	20	2511.2	526.1	20	3132.6	800.4
30	1945.0	321.1	30	2521.1	530.1	30	3143.4	805.6
40	1954.3	324.1	40	2531.1	534.2	40	3154.2	810.9
50	1963.6	327.1	50	2541.0	538.2	50	3165.1	816.1
38	1972.9	330.2	48	2551.0	542.2	58	3176.0	821.4
10	1982.2	333.2	10	2561.0	546.3	10	3186.9	826.7
20	1991.5	336.3	20	2571.0	550.4	20	3197.8	832.0
30	2000.9	339.3	30	2581.0	554.5	30	3208.8	837.3
40	2010.2	342.4	40	2591.0	558.6	40	3219.7	842.7
50	2019.6	345.5	50	2601.1	562.8	50	3230.7	848.1
39	2029.0	348.6	49	2611.2	566.9	59	3241.7	853.5
10	2038.4	351.8	10	2621.2	571.1	10	3252.7	858.9
20	2047.8	354.9	20	2631.3	575.3	20	3263.7	864.3
30	2057.2	358.1	30	2641.4	579.5	30	3274.8	869.8
40	2066.6	361.3	40	2651.5	583.8	40	3285.8	875.3
50	2076.0	364.5	50	2661.6	588.0	50	3296.9	880.8
40	2085.4	367.7	50	2671.8	592.3	60	3308.0	886.4
10	2094.9	371.0	10	2681.9	596.6	10	3319.1	892.0
20	2104.3	374.2	20	2692.1	600.9	20	3330.3	897.5
30	2113.8	377.5	30	2702.3	605.3	30	3341.4	903.2
40	2123.3	380.8	40	2712.5	609.6	40	3352.6	908.8
50	2132.7	384.1	50	2722.7	614.0	50	3363.8	914.5

Table V.—Tangents and Externals to a 1° Curve.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
61°	3375.0	920.2	**71°**	4086.9	1308.2	**81°**	4893.6	1805.3
10′	3386.3	925.9	10′	4099.5	1315.6	10′	4908.0	1814.7
20	3397.5	931.6	20	4112.1	1322.9	20	4922.5	1824.1
30	3408.8	937.3	30	4124.8	1330.3	30	4937.0	1833.6
40	3420.1	943.1	40	4137.4	1337.7	40	4951.5	1843.1
50	3431.4	948.9	50	4150.1	1345.1	50	4966.1	1852.6
62	3442.7	954.8	**72**	4162.8	1352.6	**82**	4980.7	1862.2
10	3454.1	960.6	10	4175.6	1360.1	10	4995.4	1871.8
20	3465.4	966.5	20	4188.5	1367.6	20	5010.0	1881.5
30	3476.8	972.4	30	4201.2	1375.2	30	5024.8	1891.2
40	3488.3	978.3	40	4214.0	1382.8	40	5039.5	1900.9
50	3499.7	984.3	50	4226.8	1390.4	50	5054.3	1910.7
63	3511.1	990.2	**73**	4239.7	1398.0	**83**	5069.2	1920.5
10	3522.6	996.2	10	4252.6	1405.7	10	5084.0	1930.4
20	3534.1	1002.3	20	4265 6	1413.5	20	5099.0	1940.3
30	3545.6	1008.3	30	4278.5	1421.2	30	5113.9	1950.3
40	3557.2	1014.4	40	4291.5	1429.0	40	5128.9	1960.2
50	3568.7	1020.5	50	4304.6	1436.8	50	5143.9	1970.3
64	3580.3	1026.6	**74**	4317.6	1444.6	**84**	5159.0	1980.4
10	3591.9	1032.8	10	4330.7	1452.5	10	5174.1	1990.5
20	3603.5	1039.0	20	4343.8	1460.4	20	5189.3	2000.6
30	3615.1	1045.2	30	4356.9	1468.4	30	5204.4	2010.8
40	3626.8	1051.4	40	4370.1	1476.4	40	5219.7	2021.1
50	3638.5	1057.7	50	4383.3	1484.4	50	5234.9	2031.4
65	3650.2	1063.9	**75**	4396.5	1492.4	**85**	5250.3	2041.7
10	3661.9	1070.2	10	4409.8	1500.5	10	5265.6	2052.1
20	3673.7	1076.6	20	4423.1	1508.6	20	5281.0	2062.5
30	3685.4	1082.9	30	4436.4	1516.7	30	5296.4	2073.0
40	3697.2	1089.3	40	4449.7	1524.9	40	5311.9	2083.5
50	3709.0	1095.7	50	4463.1	1533.1	50	5327.4	2094.1
66	3720.9	1102.2	**76**	4476.5	1541.4	**86**	5343.0	2104.7
10	3732.7	1108.6	10	4489.9	1549.7	10	5358.6	2115.3
20	3744.6	1115.1	20	4503.4	1558.0	20	5374.2	2126.0
30	3756.5	1121.7	30	4516.9	1566.3	30	5389.9	2136.7
40	3768.5	1128.2	40	4530.4	1574.7	40	5405.6	2147.5
50	3780.4	1134.8	50	4544.0	1583.1	50	5421.4	2158.4
67	3792.4	1141.4	**77**	4557.6	1591.6	**87**	5437.2	2169.2
10	3804.4	1148.0	10	4571.2	1600.1	10	5453.1	2180.2
20	3816.4	1154.7	20	4584.8	1608.6	20	5469.0	2191.1
30	3828.4	1161.3	30	4598.5	1617.1	30	5484.9	2202.2
40	3840.5	1168.1	40	4612.2	1625.7	40	5500.9	2213.2
50	3852.6	1174.8	50	4626.0	1634.4	50	5517.0	2224.3
68	3864.7	1181.6	**78**	4639.8	1643.0	**88**	5533.1	2235.5
10	3876.8	1188.4	10	4653.6	1651.7	10	5549.2	2246.7
20	3889.0	1195.2	20	4667.4	1660.5	20	5565.4	2258.0
30	3901.2	1202.0	30	4681.3	1669.2	30	5581.6	2269.3
40	3913.4	1208.9	40	4695.2	1678.1	40	5597.8	2280.6
50	3925.6	1215.8	50	4709.2	1686.9	50	5614.2	2292.0
69	3937.9	1222.7	**79**	4723.2	1695.8	**89**	5630.5	2303.5
10	3950.2	1229.7	10	4737.2	1704.7	10	5646.9	2315.0
20	3962.5	1236.7	20	4751.2	1713.7	20	5663.4	2326.6
30	3974.8	1243.7	30	4765.3	1722.7	30	5679.9	2338.2
40	3987.2	1250.8	40	4779.4	1731.7	40	5696.4	2349.8
50	3999.5	1257.9	50	4793.6	1740.8	50	5713.0	2361.5
70	4011.9	1265.0	**80**	4807.7	1749.9	**90**	5729.7	2373.3
10	4024.4	1272.1	10	4822.0	1759.0	10	5746.3	2385.1
20	4036.8	1279.3	20	4836.2	1768.2	20	5763.1	2397.0
30	4049.3	1286.5	30	4850.5	1777.4	30	5779.9	2408.9
40	4061.8	1293.6	40	4864.8	1786.7	40	5796.7	2420.9
50	4074.4	1300.9	50	4879.2	1796.0	50	5813.6	2432.9

Table V.—Tangents and Externals to a 1° Curve.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
91°	5830.5	2444.9	**101°**	6950.6	3278.1	**111°**	8336.7	4386.1
10′	5847.5	2457.1	10′	6971.3	3294.1	10′	8362.7	4407.6
20	5864.6	2469.3	20	6992.0	3310.1	20	8388.9	4429.2
30	5881.7	2481.5	30	7012.7	3326.1	30	8415.1	4450.9
40	5898.8	2493.8	40	7033.6	3342.3	40	8441.5	4472.7
50	5916.0	2506.1	50	7054.5	3358.5	50	8468.0	4494.6
92	5933.2	2518.5	**102**	7075.5	3374.9	**112**	8494.6	4516.6
10	5950.5	2531.0	10	7096.6	3391.2	10	8521.3	4538.8
20	5967.9	2543.5	20	7117.8	3407.7	20	8548.1	4561.1
30	5985.3	2556.0	30	7139.0	3424.3	30	8575.0	4583.4
40	6002.7	2568.6	40	7160.3	3440.9	40	8602.1	4606.0
50	6020.2	2581.3	50	7181.7	3457.6	50	8629.3	4628.6
93	6037.8	2594.0	**103**	7203.2	3474.4	**113**	8656.6	4651.3
10	6055 4	2606.8	10	7224.7	3491.3	10	8684.0	4674.2
20	6073.1	2619.7	20	7246.3	3508.2	20	8711.5	4697.2
30	6090.8	2632.6	30	7268.0	3525.2	30	8739.2	4720.3
40	6108.6	2645.5	40	7289.8	3542.4	40	8767.0	4743.6
50	6126.4	2658.5	50	7311.7	3559.6	50	8794.9	4766.9
94	6144.3	2671.6	**104**	7333.6	3576.8	**114**	8822.9	4790.4
10	6162.6	2684.7	10	7355.6	3594.2	10	8851.0	4814.1
20	6180.2	2697.9	20	7377.8	3611.7	20	8879.3	4837.8
30	6198.3	2711.2	30	7399.9	3629.2	30	8907.7	4861.7
40	6216.4	2724.5	40	7422.2	3646.8	40	8936.3	4885.7
50	6234.6	2737.9	50	7444.6	3664.5	50	8965.0	4909.9
95	6252.8	2751.3	**105**	7467.0	3682.3	**115**	8993.8	4934.1
10	6271.1	2764.8	10	7489.6	3700.2	10	9022.7	4958.6
20	6289.4	2778.3	20	7512.2	3718.2	20	9051.7	4983.1
30	6307.9	2792.0	30	7534.9	3736.2	30	9080.9	5007.8
40	6326.3	2805.6	40	7557.7	3754.4	40	9110.3	5032.6
50	6344.8	2819.4	50	7580.5	3772.6	50	9139.8	5057.6
96	6363.4	2833.2	**106**	7603.5	3791.0	**116**	9169.4	5082.7
10	6382.1	2847.0	10	7626.6	3809.4	10	9199.1	5107.9
20	6400.8	2861.0	20	7649.7	3827.9	20	9229.0	5133.3
30	6419.5	2875.0	30	7672.9	3846.5	30	9259.0	5158.8
40	6438.4	2889.0	40	7696.3	3865.2	40	9289.2	5184.5
50	6457.3	2903.1	50	7719.7	3884.0	50	9319.5	5210.3
97	6476.2	2917.3	**107**	7743.2	3902.9	**117**	9349.9	5236.2
10	6495.2	2931.6	10	7766.8	3921.9	10	9380.5	5262.3
20	6514.3	2945.9	20	7790.5	3940.9	20	9411.3	5288.6
30	6533.4	2960.3	30	7814.3	3960.1	30	9442.2	5315.0
40	6552.6	2974.7	40	7838.1	3979.4	40	9473.2	5341.5
50	6571.9	2989.2	50	7862.1	3998.7	50	9504.4	5368.2
98	6591.2	3003.8	**108**	7886.2	4018.2	**118**	9535.7	5395.1
10	6610.6	3018.4	10	7910.4	4037.8	10	9567.2	5422.1
20	6630.1	3033.1	20	7934.6	4057.4	20	9598.9	5449.2
30	6649.6	3047.9	30	7959.0	4077.2	30	9630.7	5476.5
40	6669.2	3062.8	40	7983.5	4097.1	40	9662.6	5504.0
50	6688.8	3077.7	50	8008.0	4117.0	50	9694.7	5531.7
99	6708.6	3092.7	**109**	8032.7	4137.1	**119**	9727.0	5559.4
10	6728.4	3107.7	10	8057.4	4157.3	10	9759.4	5587.4
20	6748.2	3122.9	20	8082.3	4177.5	20	9792.0	5615.5
30	6768.1	3138.1	30	8107.3	4197.9	30	9824.8	5643.8
40	6788.1	3153.3	40	8132.3	4218.4	40	9857.7	5672.3
50	6808.2	3168.7	50	8157.5	4239.0	50	9890.8	5700.9
100	6828.3	3184.1	**110**	8182.8	4259.7	**120**	9924.0	5729.7
10	6848.5	3199.6	10	8208.2	4280.5	10	9957.5	5758.6
20	6868.8	3215.1	20	8233.7	4301.4	20	9991.0	5787.7
30	6889.2	3230.8	30	8259.3	4322.4	30	10025.0	5817.0
40	6909.6	3246.5	40	8285.0	4343.6	40	10059.0	5846.5
50	6930.1	3262.3	50	8310.8	4364.8	50	10093.0	5876.1

Table VI.—Corrections for Tangents and Externals.

These corrections are to be added to the approximate values, found by dividing the tangent, or external, for a 1° curve (Table IV) by the degree of curve, in order to obtain the true tangents, or externals. Intermediate values may be obtained by interpolation.

For Tangents Add

Central Angle	Degree of Curve													
	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°	.03	.06	.09	.13	.16	.19	.22	.25	.28	.31	.34	.38	.42	.46
15°	.04	.10	.14	.19	.24	.29	.34	.39	.45	.51	.53	.58	.63	.68
20°	.06	.13	.19	.26	.32	.39	.45	.51	.58	.65	.72	.79	.84	.90
25°	.08	.16	.24	.33	.40	.49	.58	.67	.75	.83	.90	.99	1.06	1.14
30°	.10	.19	.29	.39	.49	.59	.69	.79	.89	.99	1.09	1.20	1.29	1.39
35°	.11	.22	.34	.47	.58	.69	.70	.81	.92	1.04	1.29	1.42	1.54	1.66
40°	.13	.26	.40	.53	.67	.80	.93	1.06	1.20	1.34	1.49	1.64	1.79	1.94
45°	.15	.30	.44	.60	.76	.91	1.06	1.21	1.37	1.52	1.70	1.87	2.04	2.21
50°	.17	.34	.51	.68	.85	1.02	1.19	1.36	1.54	1.72	1.91	2.10	2.29	2.48
55°	.19	.38	.57	.76	.95	1.14	1.32	1.52	1.72	1.92	2.14	2.35	2.56	2.77
60°	.21	.42	.63	.84	1.05	1.27	1.49	1.71	1.94	2.17	2.38	2.60	2.83	3.07
65°	.23	.46	.69	.93	1.16	1.40	1.64	1.88	2.13	2.38	2.63	2.88	3.13	3.39
70°	.25	.51	.76	1.02	1.28	1.54	1.80	2.06	2.33	2.60	2.88	3.16	3.44	3.72
75°	.27	.56	.83	1.12	1.40	1.69	1.98	2.27	2.57	2.87	3.16	3.47	3.78	4.09
80°	.30	.61	.91	1.22	1.53	1.84	2.15	2.46	2.78	3.10	3.44	3.78	4.12	4.46
85°	.33	.66	1.00	1.33	1.68	2.02	2.36	2.70	3.05	3.40	3.77	4.14	4.55	4.89
90°	.36	.72	1.09	1.45	1.83	2.20	2.57	2.94	3.32	3.70	4.10	4.50	4.91	5.32
95°	.39	.79	1.19	1.55	2.00	2.40	2.80	3.20	3.61	4.02	4.40	4.98	5.38	5.83
100°	.43	.86	1.30	1.74	2.18	2.62	3.06	3.50	3.95	4.40	4.88	5.37	5.85	6.34
110°	.51	1.03	1.56	2.08	2.61	3.14	3.67	4.21	4.76	5.31	5.86	6.43	7.01	7.60
120°	.62	1.25	1.93	2.52	3.16	3.81	4.45	5.11	5.77	6.44	7.12	7.80	8.50	9.22

For Externals Add

Central Angle	Degree of Curve													
	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°	.001	.003	.004	.006	.007	.008	.009	.011	.012	.014	.015	.017	.018	.020
15°	.003	.007	.010	.014	.018	.023	.027	.029	.032	.035	.039	.043	.047	.051
20°	.006	.011	.017	.022	.028	.034	.038	.045	.051	.057	.063	.070	.076	.083
25°	.009	.018	.027	.036	.046	.056	.065	.074	.083	.093	.106	.120	.127	.135
30°	.013	.025	.038	.051	.065	.078	.090	.103	.116	.129	.149	.170	.179	.188
35°	.018	.035	.054	.072	.086	.109	.131	.153	.175	.197	.213	.230	.247	.264
40°	.023	.046	.070	.093	.117	.141	.172	.203	.234	.265	.277	.290	.315	.341
45°	.030	.060	.093	.119	.153	.184	.216	.254	.289	.325	.351	.378	.411	.445
50°	.037	.075	.116	.151	.189	.227	.266	.305	.345	.384	.425	.467	.508	.550
55°	.046	.093	.142	.188	.236	.283	.332	.381	.420	.479	.530	.582	.641	.700
60°	.056	.112	.168	.225	.283	.340	.398	.457	.516	.575	.636	.697	.774	.851
65°	.067	.135	.204	.273	.343	.412	.483	.554	.625	.697	.711	.845	.922	1.01
70°	.080	.159	.240	.321	.403	.485	.568	.652	.735	.819	.906	.994	1.08	1.17
75°	.095	.182	.286	.383	.480	.578	.678	.777	.877	.977	1.07	1.18	1.29	1.39
80°	.110	.220	.332	.445	.558	.671	.787	.903	1.02	1.13	1.25	1.38	1.50	1.62
85°	.128	.259	.391	.524	.657	.790	.926	1.06	1.20	1.34	1.47	1.62	1.76	1.91
90°	.149	.299	.450	.603	.756	.910	1.07	1.22	1.38	1.54	1.70	1.87	2.03	2.20
95°	.174	.350	.522	.706	.985	1.06	1.25	1.43	1.62	1.80	1.99	2.18	2.38	2.53
100°	.200	.401	.604	.809	1.01	1.22	1.43	1.64	1.85	2.06	2.28	2.50	2.73	2.96
110°	.268	.536	.806	1.08	1.35	1.63	1.91	2.20	2.48	2.76	3.05	3.35	3.66	3.96
120°	.360	.721	1.08	1.45	1.82	2.19	2.57	2.95	3.33	3.72	4.11	4.50	4.91	5.32

Table VII.—Corrections for Sub-Chords and Long Chords.

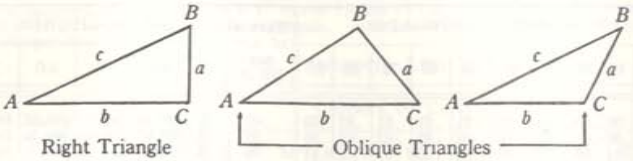
FOR SUB-CHORDS ADD										Excess of arc per 100 ft.	LONG CHORDS				
D	10	20	30	40	50	60	70	80	90		D	200	300	400	500
4°	.00	.00	.01	.01	.01	.01	.01	.01	.00	.02	1	199.99	299.97	399.92	499.85
6	.00	.01	.01	.02	.02	.02	.02	.01	.01	.05	2	199.97	299.88	399.70	499.39
8	.01	.02	.02	.03	.03	.03	.03	.02	.01	.08	3	199.93	299.73	399.32	498.63
10	.01	.02	.03	.04	.05	.05	.05	.04	.02	.13	4	199.88	299.51	398.78	497.57
12	.02	.04	.05	.06	.07	.07	.07	.05	.03	.18	5	199.81	299.24	398.10	496.20
14	.02	.05	.07	.08	.09	.10	.09	.07	.04	.25	6	199.73	298.90	397.26	494.53
16	.03	.06	.09	.11	.12	.12	.12	.09	.05	.33	7	199.63	298.51	396.28	492.57
18	.04	.08	.11	.14	.15	.16	.15	.12	.07	.41	8	199.51	298.05	395.14	490.31
20	.05	.10	.14	.17	.19	.20	.18	.15	.09	.51	9	199.38	297.54	393.86	487.75
22	.06	.12	.17	.21	.23	.24	.22	.18	.10	.62	10	199.24	296.96	392.42	484.90
24	.07	.14	.20	.25	.28	.28	.26	.21	.12	.74	12	198.90	295.63	389.12	478.34
26	.09	.17	.24	.29	.32	.33	.31	.25	.15	.86	14	198.51	294.06	385.22	470.65
28	.10	.19	.27	.34	.37	.38	.36	.29	.17	1.00	16	198.05	292.25	380.76	461.86
30	.11	22	.31	.39	.43	.44	.41	.33	.19	1.15	18	197.54	290.21	375.74	452.02
32	.13	.25	.36	.44	.49	.50	.47	.38	.22	1.31	20	196.90	287.94	370.17	441.15
34	.15	.28	.40	.50	.55	.57	.53	.43	.25	1.48	22	196.32	285.44	364.06	429.30
36	.17	.32	.45	.56	.62	.64	.59	.48	.28	1.66	24	195.63	282.71	357.43	416.53
38	.18	.36	.51	.62	.70	.71	.66	.53	.31	1.86	26	194.87	279.76	350.30	402.89
40	.21	.40	.56	.69	.77	.79	.73	.59	.35	2.06	28	194.06	276.59	342.69	388.42
42	.23	.44	.62	.76	.85	.87	.81	.65	.38	2.28	30	193.18	273.20	334.61	373.20
44	.25	.48	.68	.84	.94	.96	.89	.72	.42	2.50	32	192.25	269.61	326.08	357.28
46	.27	.52	.75	.92	1.02	1.05	.98	.78	.46	2.74	34	191.26	265.81	317.12	340.73
48	.30	.57	.81	1.00	1.12	1.14	1.06	.86	.50	2.99	36	190.21	261.80	307.77	323.61
50	.32	.62	.89	1.09	1.21	1.24	1.15	.93	.55	3.24	38	189.10	257.60	298.03	305.99
52	.35	.67	.96	1.18	1.31	1.35	1.25	1.01	.59	3.52	40	187.94	253.21	287.94	287.94
54	.38	.73	1.04	1.28	1.42	1.46	1.35	1.09	.64	3.80	42	186.72	248.63	277.51	269.54
56	.41	.78	1.12	1.38	1.53	1.57	1.46	1.17	.69	4.09	44	185.44	243.87	266.78	250.85
58	.44	.84	1.20	1.48	1.65	1.69	1.57	1.20	.74	4.40	46	184.10	239.93	255.78	231.95
60	.47	.91	1.29	1.59	1.76	1.81	1.68	1.35	.80	4.72	48	182.71	233.83	244.51	212.92

NOTE.—When a chord of less than 100 ft. is used the corrections given in the above table should be added to the nominal length of chord to get the length which should be used in order that the 100 ft. points will check with those obtained by using the standard 100 ft. chord. Thus in locating a 14° curve by 25 ft. chords measure 25′.06 for each chord. Long chords are useful in passing obstacles.

Table VIII.—Middle Ordinates for Rails in Feet.

Deg. of Curve	LENGTH OF RAILS							Deg. of Curve	LENGTH OF RAILS						
	32	30	28	26	24	22	20		32	30	28	26	24	22	20
1°	.022	.020	.016	.013	.011	.009	.008	16°	.356	.313	.273	.236	.200	.170	.139
2	.045	.038	.034	.029	.025	.021	.017	17	.378	.333	.290	.252	.213	.180	.148
3	.067	.058	.051	.044	.037	.031	.026	18	.400	.351	.306	.265	.225	.190	.156
4	.089	.079	.069	.060	.050	.042	.035	19	.423	.371	.324	.280	.238	.201	.165
5	.112	.099	.086	.074	.063	.053	.044	20	.445	.392	.341	.296	.250	.212	.174
6	.134	.117	.102	.088	.076	.064	.052	21	.466	.410	.357	.309	.262	.222	.182
7	.156	.137	.120	.104	.088	.074	.061	22	.487	.430	.375	.325	.275	.233	.191
8	.179	.158	.137	.119	.100	.085	.070	23	.509	.450	.390	.338	.287	.243	.199
9	.201	.175	.153	.133	.112	.095	.078	24	.531	.469	.408	.354	.299	.253	.208
10	.223	.196	.171	.148	.125	.106	.087	25	.552	.486	.424	.367	.311	.263	.216
11	.245	.216	.188	.163	.139	.117	.096	26	.573	.506	.441	.382	.323	.274	.225
12	.268	.236	.206	.179	.151	.128	.105	27	.594	.524	.457	.396	.335	.284	.233
13	.290	.254	.222	.192	.163	.138	.113	28	.618	.545	.475	.411	.348	.294	.242
14	.312	.275	.239	.207	.175	.148	.122	29	.638	.564	.491	.424	.361	.303	.250
15	.334	.295	.257	.223	.188	.159	.131	30	.660	.583	.508	.438	.374	.313	.259

TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

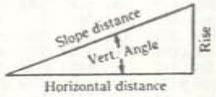
Given	Required	
a, b	A, B, c	$\tan A = \frac{a}{b} = \cot B,\ c = \sqrt{a^2+b^2} = a\sqrt{1+\frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B, b = \sqrt{(c+a)\,c-a)} = c\sqrt{1-\frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90° - A,\ b = a \cot A,\ c = \frac{a}{\sin A.}$
A, b	B, a, c	$B = 90° - A,\ a = b \tan A,\ c = \frac{b}{\cos A.}$
A, c	B, a, b	$B = 90° - A,\ a = c \sin A,\ b = c \cos A.$

Solution of Oblique Triangles

Given	Required	
A, B, a	b, c, C	$b = \frac{a \sin B}{\sin A},\ C = 180° - (A+B),\ c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a},\ C = 180° - (A+B),\ c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A+B = 180° - C, \tan\frac{1}{2}(A-B) = \frac{(a-b)\tan\frac{1}{2}(A+B)}{a+b}$ $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a+b+c}{2},\ \sin\frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{b\,c}},$ $\sin\frac{1}{2}B = \sqrt{\frac{(s-a)(s-c)}{a\,c}},\ C = 180° - (A+B)$
a, b, c	Area	$s = \frac{a+b+c}{2},\ \text{area} = \sqrt{s(s-a)\ (s-b)\ (s-c)}$
A, b, c	Area	$\text{area} = \frac{b\,c \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL

Horizontal distance = slope distance multiplied by the cosine of the vertical angle. Thus, for a slope distance of 403.6 ft. and a vertical angle of 4° 40′—the cosine of 4° 40′, taken from a table of natural trigonometrical functions, = .9967, and horizontal distance = 403.6 x .9967 = 402.27 ft.



Horizontal distance also = Slope distance minus slope distance times (1 — cosine of vertical angle). Using the same figures as in the preceding example — Cos. 4° 40′ = .9967. 1 — .9967 = .0033. 403.6 x .0033 = 1.33 ft. Horizontal dist. = 403.6 - 1.33 = 402.27 ft.

When the rise is known, the horizontal distance may be found by the following approximate rule:— the slope distance less the square of the rise divided by twice the slope distance. Thus, for a slope distance of 372.5 ft., and a rise of 15 ft. the horizontal distance =

$$372.5 - \frac{15 \times 15}{2 \times 372.5} = 372.5 - .30 = 372.2 \text{ ft.}$$

Table IX.—Natural Trigonometrical Functions.

Angle	Sin	Tan	Cot	Cos		Angle	Sin	Tan	Cot	Cos	
° ′						° ′					
0	**0**	**0**	**00**	**1**	**90**	**8**	.1392	.1405	7.115	.99027	**82**
10	.0029	.0029	343.8	1	50	10	.1421	.1435	6.968	.98986	50
20	.0058	.0058	171.9	.99998	40	20	.1449	.1465	6.827	.98944	40
30	.0087	.0087	114.6	.99996	30	30	.1478	.1495	6.691	.98902	30
40	.0116	.0116	85.94	.99993	20	40	.1507	.1524	6.561	.98858	20
50	.0145	.0145	68.75	.99989	10	50	.1536	.1554	6.435	.98814	10
1	.0175	.0175	57.29	.99985	**89**	**9**	.1564	.1584	6.314	.98769	**81**
10	.0204	.0204	49.10	.99979	50	10	.1593	.1614	6.197	.98723	50
20	.0233	.0233	42.96	.99973	40	20	.1622	.1644	6.084	.98676	40
30	.0262	.0262	38.19	.99966	30	30	.1650	.1673	5.976	.98629	30
40	.0291	.0291	34.37	.99958	20	40	.1679	.1703	5.871	.98580	20
50	.0320	.0320	31.24	.99949	10	50	.1708	.1733	5.769	.98531	10
2	.0349	.0349	28.64	.99939	**88**	**10**	.1736	.1763	5.671	.98481	**80**
10	.0378	.0378	26.43	.99929	50	10	.1765	.1793	5.576	.98430	50
20	.0407	.0407	24.54	.99917	40	20	.1794	.1823	5.485	.98378	40
30	.0436	.0437	22.90	.99905	30	30	.1822	.1853	5.396	.98325	30
40	.0465	.0466	21.47	.99892	20	40	.1851	.1883	5.309	.98272	20
50	.0494	.0495	20.21	.99878	10	50	.1880	.1914	5.226	.98218	10
3	.0523	.0524	19.08	.99863	**87**	**11**	.1908	.1944	5.145	.98163	**79**
10	.0552	.0553	18.07	.99847	50	10	.1937	.1974	5.066	.98107	50
20	.0581	.0582	17.17	.99831	40	20	.1965	.2004	4.989	.98050	40
30	.0610	.0612	16.35	.99813	30	30	.1994	.2035	4.915	.97992	30
40	.0640	.0641	15.60	.99795	20	40	.2022	.2065	4.843	.97934	20
50	.0669	.0670	14.92	.99776	10	50	.2051	.2095	4.773	.97875	10
4	.0698	.0699	14.30	.99756	**86**	**12**	.2079	.2126	4.705	.97815	**78**
10	.0727	.0729	13.73	.99736	50	10	.2108	.2156	4.638	.97754	50
20	.0756	.0758	13.20	.99714	40	20	.2136	.2186	4.574	.97692	40
30	.0785	.0787	12.71	.99692	30	30	.2164	.2217	4.511	.97630	30
40	.0814	.0816	12.25	.99668	20	40	.2193	.2247	4.449	.97566	20
50	.0843	.0846	11.83	.99644	10	50	.2221	.2278	4.390	.97502	10
5	.0872	.0875	11.43	.99619	**85**	**13**	.2250	.2309	4.331	.97437	**77**
10	.0901	.0904	11.06	.99594	50	10	.2278	.2339	4.275	.97371	50
20	.0929	.0934	10.71	.99567	40	20	.2306	.2370	4.219	.97304	40
30	.0958	.0963	10.39	.99540	30	30	.2334	.2401	4.165	.97237	30
40	.0987	.0992	10.08	.99511	20	40	.2363	.2432	4.113	.97169	20
50	.1016	.1022	9.788	.99482	10	50	.2391	.2462	4.061	.97100	10
6	.1045	.1051	9.514	.99452	**84**	**14**	.2419	.2493	4.011	.97030	**76**
10	.1074	.1080	9.255	.99421	50	10	.2447	.2524	3.962	.96959	50
20	.1103	.1110	9.010	.99390	40	20	.2476	.2555	3.914	.96887	40
30	.1132	.1139	8.777	.99357	30	30	.2504	.2586	3.867	.96815	30
40	.1161	.1169	8.556	.99324	20	40	.2532	.2617	3.821	.96742	20
50	.1190	.1198	8.345	.99290	10	50	.2560	.2648	3.776	.96667	10
7	.1219	.1228	8.144	.99255	**83**	**15**	.2588	.2679	3.732	.96593	**75**
10	.1248	.1257	7.953	.99219	50	10	.2616	.2711	3.689	.96517	50
20	.1276	.1287	7.770	.99182	40	20	.2644	.2742	3.647	.96440	40
30	.1305	.1317	7.596	.99144	30	30	.2672	.2773	3.606	.96363	30
40	.1334	.1346	7.429	.99106	20	40	.2700	.2805	3.566	.96285	20
50	.1363	.1376	7.269	.99067	10	50	.2728	.2836	3.526	.96206	10
					82						**74**
	Cos	Cot	Tan	Sin	Angle		Cos	Cot	Tan	Sin	Angle

Table IX.—Natural Trigonometrical Functions.

Angle	Sin	Tan	Cot	Cos		Angle	Sin	Tan.	Cot	Cos	
° ′						° ′					
16	.2756	.2867	3.487	.96126	**74**	**24**	.4067	.4452	2.246	.91355	**66**
10	.2784	.2899	3.450	.96046	50	10	.4094	.4487	2.229	.91236	50
20	.2812	.2931	3.412	.95964	40	20	.4120	.4522	2.211	.91116	40
30	.2840	.2962	3.376	.95882	30	30	.4147	.4557	2.194	.90996	30
40	.2868	.2994	3.340	.95799	20	40	.4173	.4592	2.177	.90875	20
50	.2896	.3026	3.305	.95715	10	50	.4200	.4628	2.161	.90753	10
17	.2924	.3057	3.271	.95630	**73**	**25**	.4226	.4663	2.145	.90631	**65**
10	.2952	.3089	3.237	.95545	50	10	.4253	.4699	2.128	.90507	50
20	.2979	.3121	3.204	.95459	40	20	.4279	.4734	2.112	.90383	40
30	.3007	.3153	3.172	.95372	30	30	.4305	.4770	2.097	.90259	30
40	.3035	.3185	3.140	.95284	20	40	.4331	.4806	2.081	.90133	20
50	.3062	.3217	3.108	.95195	10	50	.4358	.4841	2.066	.90007	10
18	.3090	.3249	3.078	.95106	**72**	**26**	.4384	.4877	2.050	.89879	**64**
10	.3118	.3281	3.048	.95015	50	10	.4410	.4913	2.035	.89752	50
20	.3145	.3314	3.018	.94924	40	20	.4436	.4950	2.020	.89623	40
30	.3173	.3346	2.989	.94832	30	30	.4462	.4986	2.006	.89493	30
40	.3201	.3378	2.960	.94740	20	40	.4488	.5022	1.991	.89363	20
50	.3228	.3411	2.932	.94646	10	50	.4514	.5059	1.977	.89232	10
19	.3256	.3443	2.904	.94552	**71**	**27**	.4540	.5095	1.963	.89101	**63**
10	.3283	.3476	2.877	.94457	50	10	.4566	.5132	1.949	.88968	50
20	.3311	.3508	2.850	.94361	40	20	.4592	.5169	1.935	.88835	40
30	.3338	.3541	2.824	.94264	30	30	.4617	.5206	1.921	.88701	30
40	.3365	.3574	2.798	.94167	20	40	.4643	.5243	1.907	.88566	20
50	.3393	.3607	2.773	.94068	10	50	.4669	.5280	1.894	.88431	10
20	.3420	.3640	2.747	.93969	**70**	**28**	.4695	.5317	1.881	.88295	**62**
10	.3448	.3673	2.723	.93869	50	10	.4720	.5354	1.868	.88158	50
20	.3475	.3706	2.699	.93769	40	20	.4746	.5392	1.855	.88020	40
30	.3502	.3739	2.675	.93667	30	30	.4772	.5430	1.842	.87882	30
40	.3529	.3772	2.651	.93565	20	40	.4797	.5467	1.829	.87743	20
50	.3557	.3805	2.628	.93462	10	50	.4823	.5505	1.816	.87603	10
21	.3584	.3839	2.605	.93358	**69**	**29**	.4848	.5543	1.804	.87462	**61**
10	.3611	.3872	2.583	.93253	50	10	.4874	.5581	1.792	.87321	50
20	.3638	.3906	2.560	.93148	40	20	.4899	.5619	1.780	.87178	40
30	.3665	.3939	2.539	.93042	30	30	.4924	.5658	1.767	.87036	30
40	.3692	.3973	2.517	.92935	20	40	.4950	.5696	1.756	.86892	20
50	.3719	.4006	2.496	.92827	10	50	.4975	.5735	1.744	.86748	10
22	.3746	.4040	2.475	.92718	**68**	**30**	.5000	.5774	1.732	.86603	**60**
10	.3773	.4074	2.455	.92609	50	10	.5025	.5812	1.720	.86457	50
20	.3800	.4108	2.434	.92499	40	20	.5050	.5851	1.709	.86310	40
30	.3827	.4142	2.414	.92388	30	30	.5075	.5890	1.698	.86163	30
40	.3854	.4176	2.394	.92276	20	40	.5100	.5930	1.686	.86015	20
50	.3881	.4210	2.375	.92164	10	50	.5125	.5969	1.675	.85866	10
23	.3907	.4245	2.356	.92050	**67**	**31**	.5150	.6009	1.664	.85717	**59**
10	.3934	.4279	2.337	.91936	50	10	.5175	.6048	1.653	.85567	50
20	.3961	.4314	2.318	.91822	40	20	.5200	.6088	1.643	.85416	40
30	.3987	.4348	2.300	.91706	30	30	.5225	.6128	1.632	.85264	30
40	.4014	.4383	2.282	.91590	20	40	.5250	.6168	1.621	.85112	20
50	.4041	.4417	2.264	.91472	10	50	.5275	.6208	1.611	.84959	10
					66						**58**
	Cos	Cot	Tan.	Sin	Angle		Cos	Cot	Tan.	Sin	Angle

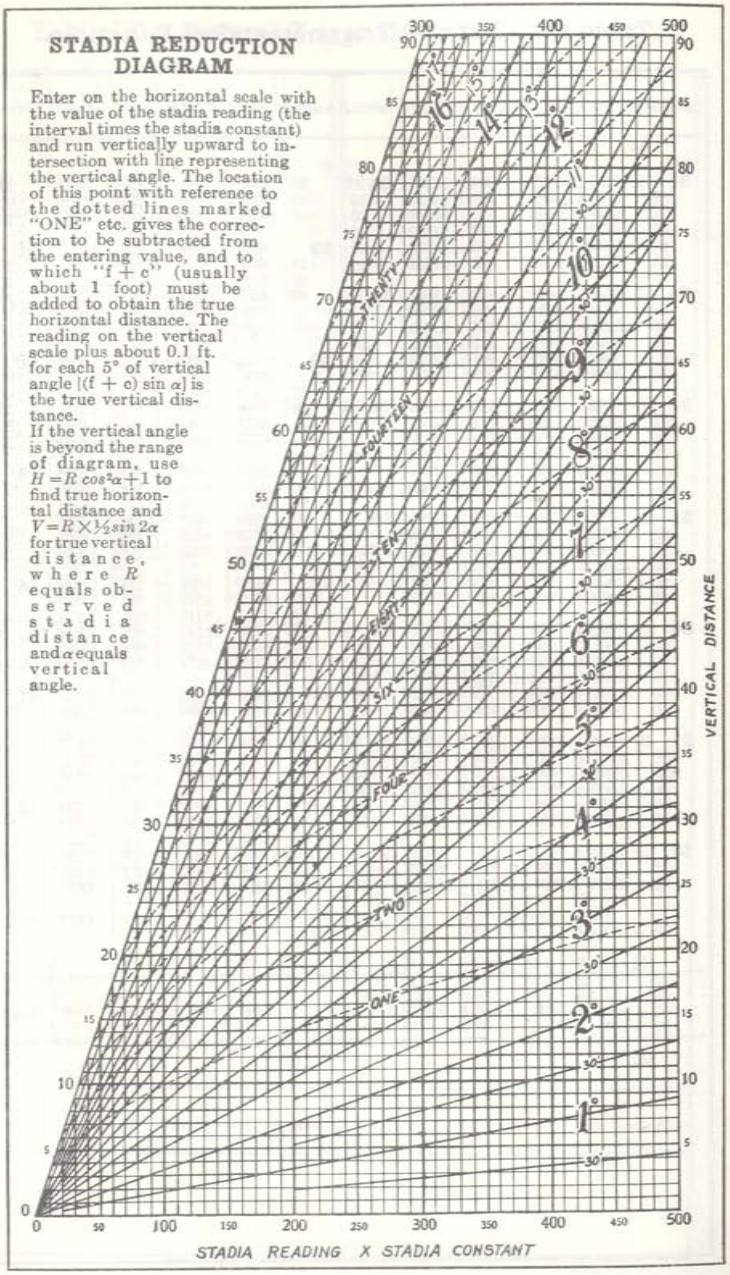
Table IX.—Natural Trigonometrical Functions.

Angle	Sin	Tan	Cot	Cos		Angle	Sin	Tan	Cot	Cos	
° ′						° ′					
32	.5299	.6249	1.600	.84805	**58**	30	.6225	.7954	1.257	.78261	30
10	.5324	.6289	1.590	.84650	50	40	.6248	.8002	1.250	.78079	20
20	.5348	.6330	1.580	.84495	40	50	.6271	.8050	1.242	.77897	10
30	.5373	.6371	1.570	.84339	30						
40	.5398	.6412	1.560	.84182	20	**39**	.6293	.8098	1.235	.77715	**51**
50	.5422	.6453	1.550	.84025	10	10	.6316	.8146	1.228	.77531	50
						20	.6338	.8195	1.220	.77347	40
33	.5446	.6494	1.540	.83867	**57**	30	.6361	.8243	1.213	.77162	30
10	.5471	.6536	1.530	.83708	50	40	.6383	.8292	1.206	.76977	20
20	.5495	.6577	1.520	.83549	40	50	.6406	.8342	1.199	.76791	10
30	.5519	.6619	1.511	.83389	30						
40	.5544	.6661	1.501	.83228	20	**40**	.6428	.8391	1.192	.76604	**50**
50	.5568	.6703	1.492	.83066	10	10	.6450	.8441	1.185	.76417	50
						20	.6472	.8491	1.178	.76229	40
34	.5592	.6745	1.483	.82904	**56**	30	.6494	.8541	1.171	.76041	30
10	.5616	.6787	1.473	.82741	50	40	.6517	.8591	1.164	.75851	20
20	.5640	.6830	1.464	.82577	40	50	.6539	.8642	1.157	.75661	10
30	.5664	.6873	1.455	.82413	30						
40	.5688	.6916	1 446	.82248	20	**41**	.6561	.8693	1.150	.75471	**49**
50	.5712	.6959	1.437	.82082	10	10	.6583	.8744	1.144	.75280	50
						20	.6604	.8796	1.137	.75088	40
35	.5736	.7002	1.428	.81915	**55**	30	.6626	.8847	1.130	.74896	30
10	.5760	.7046	1.419	.81748	50	40	.6648	.8899	1.124	.74703	20
20	.5783	.7089	1.411	.81580	40	50	.6670	.8952	1.117	.74509	10
30	.5807	.7133	1.402	.81412	30						
40	.5831	.7177	1.393	.81242	20	**42**	.6691	.9004	1.111	.74314	**48**
50	.5854	.7221	1.385	.81072	10	10	.6713	.9057	1.104	.74120	50
						20	.6734	.9110	1.098	.73924	40
36	.5878	.7265	1.376	.80902	**54**	30	.6756	.9163	1.091	.73728	30
10	.5901	.7310	1.368	.80730	50	40	.6777	.9217	1.085	.73531	20
20	.5925	.7355	1.360	.80558	40	50	.6799	.9271	1.079	.73333	10
30	.5948	.7400	1.351	.80386	30						
40	.5972	.7445	1.343	.80212	20	**43**	.6820	.9325	1.072	.73135	**47**
50	.5995	.7490	1.335	.80038	10	10	.6841	.9380	1.066	.72937	50
						20	.6862	.9435	1.060	.72737	40
37	.6018	.7536	1.327	.79864	**53**	30	.6884	.9490	1.054	.72537	30
10	.6041	.7581	1.319	.79688	50	40	.6905	.9545	1.048	.72337	20
20	.6065	.7627	1.311	.79512	40	50	.6926	.9601	1.042	.72136	10
30	.6088	.7673	1.303	.79335	30						
40	.6111	.7720	1.295	.79158	20	**44**	.6947	.9657	1.036	.71934	**46**
50	.6134	.7766	1.288	.78980	10	10	.6967	.9713	1.030	.71732	50
						20	.6988	.9770	1.024	.71529	40
38	.6157	.7813	1.280	.78801	**52**	30	.7009	.9827	1.018	.71325	30
10	.6180	.7860	1.272	.78622	50	40	.7030	.9884	1.012	.71121	20
20	.6202	.7907	1.265	.78442	40	50	.7050	.9942	1.006	.70916	10
							.7071	1.	1.	.70711	**45**
											° ′
	Cos	Cot	Tan	Sin	Angle		Cos	Cot	Tan	Sin	Angle

STADIA REDUCTION DIAGRAM

Enter on the horizontal scale with the value of the stadia reading (the interval times the stadia constant) and run vertically upward to intersection with line representing the vertical angle. The location of this point with reference to the dotted lines marked "ONE" etc. gives the correction to be subtracted from the entering value, and to which "f + c" (usually about 1 foot) must be added to obtain the true horizontal distance. The reading on the vertical scale plus about 0.1 ft. for each 5° of vertical angle [(f + c) sin α] is the true vertical distance.

If the vertical angle is beyond the range of diagram, use $H = R\cos^2\alpha + 1$ to find true horizontal distance and $V = R \times \frac{1}{2}\sin 2\alpha$ for true vertical distance, where R equals observed stadia distance and α equals vertical angle.



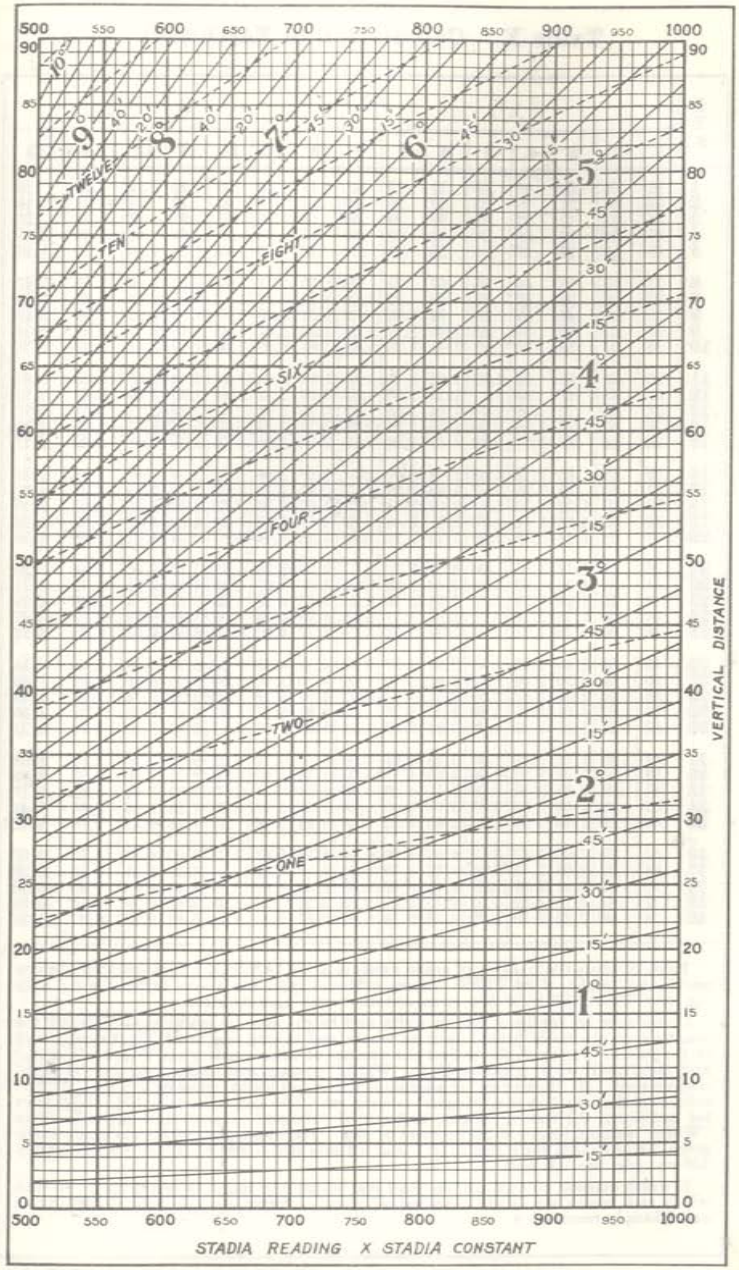


Table X.—Calculation of Earthwork.

Width	HEIGHT														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.02	.04	.06	.07	.09	.11	.13	.15	.17	.18	.20	.22	.24	.26	.28
2	.04	.07	.11	.15	.18	.22	.26	.30	.33	.37	.41	.44	.48	.52	.56
3	.06	.11	.17	.22	.28	.33	.39	.44	.50	.56	.61	.67	.72	.78	.83
4	.07	.15	.22	.30	.37	.44	.52	.59	.67	.74	.81	.89	.96	1.04	1.11
5	.09	.19	.28	.37	.46	.56	.65	.74	.83	.93	1.02	1.11	1.20	1.30	1.39
6	.11	.22	.33	.44	.56	.67	.78	.89	1.00	1.11	1.22	1.33	1.44	1.55	1.67
7	.13	.26	.39	.52	.65	.78	.91	1.04	1.16	1.30	1.42	1.55	1.68	1.81	1.94
8	.15	.30	.44	.59	.74	.89	1.04	1.19	1.33	1.48	1.63	1.78	1.92	2.08	2.22
9	.17	.33	.50	.67	.83	1.00	1.17	1.33	1.50	1.67	1.83	2.00	2.17	2.33	2.50
10	.18	.37	.56	.74	.93	1.11	1.30	1.48	1.67	1.85	2.04	2.22	2.41	2.59	2.78
11	.20	.41	.61	.82	1.02	1.22	1.43	1.63	1.83	2.04	2.24	2.44	2.65	2.85	3.06
12	.22	.44	.67	.89	1.11	1.33	1.56	1.78	2.00	2.22	2.44	2.67	2.89	3.11	3.33
13	.24	.48	.72	.96	1.20	1.44	1.68	1.92	2.16	2.41	2.65	2.89	3.13	3.37	3.61
14	.26	.52	.78	1.04	1.30	1.55	1.81	2.08	2.33	2.59	2.85	3.11	3.37	3.63	3.89
15	.28	.56	.83	1.11	1.39	1.67	1.94	2.22	2.50	2.78	3.06	3.33	3.61	3.89	4.17
16	.30	.59	.89	1.18	1.48	1.78	2.07	2.37	2.67	2.96	3.26	3.56	3.85	4.15	4.44
17	.31	.63	.94	1.26	1.57	1.89	2.20	2.52	2.83	3.15	3.46	3.78	4.09	4.41	4.72
18	.33	.67	1.00	1.33	1.67	2.00	2.33	2.67	3.00	3.33	3.67	4.00	4.33	4.67	5.00
19	.35	.70	1.06	1.41	1.76	2.11	2.46	2.82	3.17	3.52	3.87	4.22	4.57	4.92	5.28
20	.37	.74	1.11	1.48	1.85	2.22	2.59	2.96	3.33	3.70	4.07	4.44	4.81	5.18	5.56
21	.39	.78	1.17	1.55	1.94	2.33	2.72	3.11	3.50	3.89	4.28	4.67	5.06	5.44	5.83
22	.41	.81	1.22	1.63	2.04	2.44	2.85	3.26	3.67	4.07	4.48	4.89	5.30	5.70	6.11
23	.43	.85	1.28	1.70	2.13	2.56	2.98	3.41	3.83	4.26	4.68	5.11	5.54	5.96	6.39
24	.44	.89	1.33	1.78	2.22	2.67	3.11	3.56	4.00	4.44	4.89	5.33	5.78	6.22	6.67
25	.46	.92	1.39	1.85	2.31	2.78	3.24	3.70	4.17	4.63	5.09	5.56	6.02	6.48	6.94
26	.48	.96	1.44	1.92	2.41	2.89	3.37	3.85	4.33	4.82	5.30	5.78	6.26	6.74	7.24
27	.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50
28	.52	1.04	1.55	2.07	2.59	3.11	3.63	4.15	4.67	5.18	5.70	6.22	6.74	7.26	7.78
29	.54	1.07	1.61	2.15	2.68	3.22	3.76	4.30	4.83	5.37	5.91	6.44	6.98	7.52	8.06
30	.56	1.11	1.67	2.22	2.78	3.33	3.89	4.44	5.00	5.55	6.11	6.67	7.22	7.78	8.33
31	.57	1.15	1.72	2.30	2.87	3.44	4.02	4.59	5.17	5.74	6.32	6.89	7.46	8.04	8.61
32	.59	1.18	1.78	2.37	2.96	3.56	4.15	4.74	5.33	5.92	6.52	7.11	7.70	8.30	8.89
33	.61	1.22	1.83	2.44	3.05	3.67	4.28	4.89	5.50	6.11	6.72	7.33	7.94	8.55	9.17
34	.63	1.26	1.89	2.52	3.15	3.78	4.40	5.04	5.67	6.29	6.93	7.56	8.18	8.81	9.44
35	.65	1.30	1.94	2.59	3.24	3.89	4.53	5.18	5.83	6.48	7.13	7.78	8.42	9.08	9.72
36	.67	1.33	2.00	2.67	3.33	4.00	4.66	5.33	6.00	6.67	7.33	8.00	8.67	9.33	10.00
37	.68	1.37	2.06	2.74	3.42	4.11	4.79	5.48	6.17	6.85	7.54	8.22	8.91	9.59	10.28
38	.70	1.41	2.11	2.82	3.52	4.22	4.92	5.63	6.33	7.03	7.74	8.44	9.15	9.85	10.56
39	.72	1.44	2.17	2.89	3.61	4.33	5.05	5.78	6.50	7.22	7.95	8.67	9.39	10.11	10.83
40	.74	1.48	2.22	2.96	3.70	4.44	5.18	5.92	6.67	7.41	8.15	8.89	9.63	10.37	11.11

Table X gives the number of cubic yards in a TRIANGLE 1 foot deep for a given width and height. CAUTION: Values obtained from the above tables are for only the one TRIANGLE of the cross-section under consideration.

Corrections for tenths of feet in width and height may be made by considering the numbers on the table from 1 to 9 as tenths and taking one tenth the values found in the tables. For example, to find the number of cubic yards when Width = W = 16.2 and Height = H = 5.3, opposite 16 in "Width" column and under 5 in the "Height" column read 1.48. To correct for additional 0.2 foot of width, opposite 2 in the "Width" column and under 5 in the "Height" column read 0.18 and correct to .018. To correct for additional 0.3 foot in height, under 3 in "Height" column and opposite 16 in "Width" column read 0.89 and correct to .089. Therefore, the total cubic yards in the given TRIANGLE for a depth of 1 foot = 1.48 + .018 + .089 = 1.587 or approximately 159 cu. yds. per 100 feet.

If width exceeds 40 feet, use one half real width and multiply result by 2. If both width and height are larger than values given on table use one half of each value and multiply result by 4.

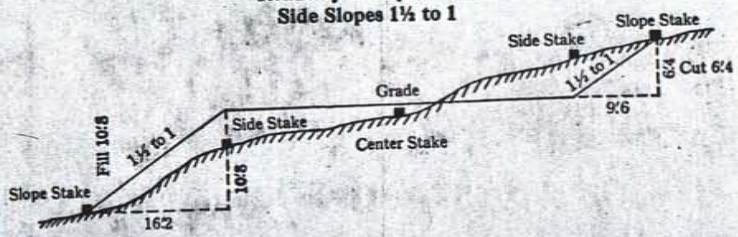
PIUTE

Bill
Mitchell

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

Roadway of any Width

Side Slopes 1½ to 1



In the figure above: Opposite 6 under "Cut or Fill" and under .4 read 9:6 the distance from the side stake to the slope stake at right. Opposite 10 under "Cut or Fill" and under .8 read 16:2, the distance from the side stake to the slope stake at the left.

Cut or Fill	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	Cut or Fill
	Distance out from Side or Shoulder Stake										
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

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William T. Mitchell II

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adularia
K-alteration

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DN 24 GC (WED)

Bill Mitchell June 20, 1984

clear blue skys warm, breeze → to wind.
Walked properties looking for laths that would identify target area. Found among others is 33, 34, 32, 79 & some along the top on the north facing slope.

Rocks varied from fresh volcanics to silicified volcanics. The best by far are the veined - stockwork in propylitically altered rocks wich cover allot of the area. Along with qtz veins; barite, seladonite(?), & pyrite are also present adularia(?) is also found in the qtz veins.

The terain is steep. w/ loose talus covering much of the slopes. The canyons still runs water, usually w/ heavy brush along the bottoms.

Access is from a dirt road that turns west about 3 miles south of Nixon, NV, into Bigmouth Canyon. With a good field vehicle it is not difficult to reach the saddle or bench on the ridge N of the target area just east of sample 83 - 33.

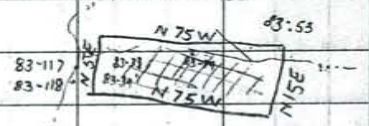
DN 24 GC (THURSDAY)

Bill Mitchell June 21, 1984

Warm, clear blue sky, breezy

Robert Lugo & I again walked around the parimmiter of the target area. We flagged the out side boundaries & came across 1983 samples 84, 53, 55, 54, 56, 117, 118. It looks like others sampled this area in 1983 there are 2 sample at a prospect pit near the top of the ridge near our 83 sample 31. Anothe sample (not ours?) #ered 83-35 is located @ a prospect pit near the east end of the target area SE of 83-84.

The corners of the sample areas have been flaged so a general area can be followed when sampling.



The actual target area appears to be where the "hot" 83 samples are located. It is concentrated with qtz veins & propilitic alteration. The west & north margins do not look this way. They look like fresher less altered volcanics.

DN 24 GC (FRIDAY)

Bill Mitchell June 22-84

Warm, clear blue skys & breezy.

Parking brake on Toyota broke, braking throttle cable when pulling it on on a steep slope. Fatiuge or I don't know my own strength? Mark & Robert continued up hill & had to remove the parking brake assembly. Throttle is temporarily functional.

Began channel sampling leap frogging Robert up the out crop. It looks like we will get a good channel sample in this area, good outcrop, we will have to zig zag but a good continous sample will be gotten. We are marking the samples w/ lath, flagging & number, & also painting the boundaries & location of the channel samples collected across the outcrops.

84003PRØ-63(11).5

5 ft channel rock chip sample. The rock is a green propylitically altered volc. rock. With weak qtz veining. The rock appears wkly-mod silicified

mod. fractured. & Mod FeOx stained w/ hem. & limon. on fracture surfaces.

Bill Mitchell (MOIN) June 25, 1984

Clear blue skys, Hot w/ slight breeze.
Repaired Toyota over weekend.

Continuing chanel sample as marked through center of target area.

84004PRØ-63(11)5

4½ ft channel rock chip. The sample is green propylitically altered porph. volc. The sample is weakly qtz veined. Mod. fractured. Wkly-mod FeOx stained (hem & limon) on fracture surfaces. The surface is vuggie

84006PRØ-63(12)5

5 ft rock chip across outcrop. This sample is green, propylitially altered. The rock is wkly silicified. Mod. qtz veining is present w/ druzzie qtz in vuggs & cavities. Qtz veins show traces of cloudy white adularia(?)

84010PRØ-63(12)5

4½ ft channel rock chip. The rock is green propylitically altered porph. volc. The rock is mod. veined (qtz). The surface is pitted from porph. being weathered out. Dark green patches (breccia clast?) are present in a large vein 1½" across a portion of the sample. FeOx staining is mostly confined to fracture surfaces. Occasional fragments are hem. stained.

84014PRØ-63(12)5

5½ ft rock chip across an outcrop. The rock is green propylitically altered porph. volc. The rock is mod qtz veined w/ druzzy coated vuggs. Some calcedonic streaked veins. Wkly FeOx stained hem & limon. on fract. surface. Adularia(?) in qtz veins.

(Tuesday)

Bill Mitchell June 26 1984

Clear blue skys, slight breeze, hot.

Chelked access to western portions of claims by swing north & riding up a switch-back up the ridge. The road we went on followed switched back & wound around to a stock tank.

84015PRØ-63(11)5

3 ft channel rck chip sample across an outcrop of green propylitically altered rck w/wk qtz veins. The qtz veins show signs of drizzy qtz in vuggs. They are for the most part near vertically orientated. Wkly FeOx stained w/hem & limon on fract. surfaces only. The orig. rk text. looks porphyritic.

84016 PRØ-63(11)5

3 ft rock chip channel sample across a green propylitically altered porph. volc. rck. wkly qtz veined. (bull qtz)

(WEDNESDAY)

Bill Mitchell June 27, 1984

Clear blue skys, breezy & hot.

Mark had a bad headace, took him back to Fernley, NV. Got fuel on way out of town.

84019PRØ-63(11)5

3½ ft channel rock chip sample across a spotty outcrop jumping up & down to keep the sample continous. sample. The rock is a green propylitically altered porph. volc. rck. It is wkly argillized. The sample is wkly qtz veined with near vertical veinlettes. These veinlettes have vuggs which are lined w/drozey qtz xt/s. Wk FeO stain (hem & limon) on fracture surfaces only.

84021PRØ-63(11)5

5 ft channel rock chip sample. The rock is a green propylitically altered porph. volc. The outcrop (sample) is wkly qtz veined. with bull qtz that has drizzy xt/s in vuggs. FeOx stain is wk on fract surfaces.

A gap of about 5' is between 19 & 20, poor exposure.

84022PRØ-63(11)5

5 ft rock chip (channel) sample across face of outcrop. The rock is propylitically altered porph. volc. (green). The rock is wkly qtz veined by veinlettes of bull qtz. Some patches look brecciated or strongly veined. Wkly FeOx stained on fracture surfaces only.

84024PRØ-63(11)5

5 ft rock chip channel sample across face of outcrop. The rock is green propylitically altered porph volc. wkly qtz veined. The qtz veinlettes are often vuggie in this sample. Often FeOx will wkly coat the vugs, otherwise FeOx is on fracture surfaces (weak).

84027PRØ-63(11)5

5 ft channel rock chip sample. The rock is green propylitically altered porph volc. Wkly qtz veined. Wkly argillized. Pitted on surface where porph. have weathered out. Wkly FeOx stained on fract surfaces.

84028PRØ-63(11)5

5 ft channel rock chip sample. The rock is green propylitically altered porph. volc. rock. Trace qtz veins. Wkly argillized w/ porph. weathered out along surface. Wk FeOx stain on fract. surfaces.

Bill Mitchell (THURSDAY) JUNE 28, 1984

Clear blue skys, comfortable breeze & hot.

84030PRØ-63(11)5

5 ft rock chip (channel) sample across an outcrop of green propylitically altered porp. volc. rock. Wkly qtz veined. Med. qtz veining of the western portion of the sample. Wk FeOx stain on fracture surfaces.

84031PRØ-63(11)5

6 ft channel rock chip sample across outcrop of green propylitically altered porph. volc. rock. The outcrop is wkly qtz veined. The eastern portion of the sample is strongly qtz veined by a small swarm of bull qtz veins with cavities. Wk FeOx stained hem, limon & jarosite(?)).

84035PRØ-61(12)5

3 ft rock chip channel along a mod. qtz veined sample. The rock is mod-strongly silicified, green porp. volc. Qtz veins range from ⅛" to 2¼" across. Some larger veins are laced with calcedonic material. The rock is wkly-mod FeOx (hem & limon) stained on fract surfaces only.

Bill Mitchell (FRI)

June 29, 1984

clear blue skys, Hazzy over Pyramid Lake (smoke). Hot & breezy.

84036PRØ-63(12)5

5 ft rock chip (channel) across an irregular outcrop of green propylitically altered rock. The rock is wkly argillized & wkly silicified(?). The rock looks to have a porph. volc. text. The sample is mod. qtz veined. The veins often occur as swarms where in this area the qtz veining is strong. The qtz veins are often vuggie some are FeOx stained on surfaces. The fract surfaces are wkly-mod FeOx stained by (hem & jarosite(?)).

84037PRØ-61(12)5

3½-4' channel rock chip across outcrop. The rock is mod-strongly silicified green propylitically altered rock. The rock is wkly-mod qtz veined w/ some large ½-2" wide veins that are banded w/ some calcedonic qtz. The veinlettes are for the most part dull qtz showing signs of xtl growth. Patches of less silicification are present. The fract. surfaces are wkly FeOx stained w/ hem, limon, & jarosite(?).

Cannot see the Mnt Range east of Nixon, NV & can smell smoke.

84041PRØ-61(13)5

5 ft channel rock chip up outcrop. The whole sample is strongly silicified & strongly qtz veined. The veins have vuggs & developed druzzy xtls on the surface of vuggs. The rock is green propylitically(?) altered porph. volc. Strongly qtz veined. Wkly FeOx stained on fract. surfaces only. This sample is the next sample East about 80' north of 84040AR

84042PRØ-61(11)5

5 ft rock chip channel sample continuing up outcrop from 84041PR. This sample is green propylitically altered porph. volc. The rock is mod. silicified & wkly qtz veined. Stronger qtz veining on the east side next to 84041PR. FeOx staining is mod on fracture surfaces.

6/29 Reno — SAMPLES 84001PR → 84042PR TO HUNTER LABS

Bill Mitchell — July 2, 1984 (MON)

Clear blue skys, Hot & a breeze.

84044PRØ-63(11)5

5 ft channel rock chip sample across two outcrops. The rock is green propylitically altered porph. volc. rock. Wkly argillized. Wkly qtz veined. Just a few qtz veins are in the sample. Randomly oriented. Wkly FeOx stained (hem, limon) on fract. surfaces only.

84045PRØ-63(13)5

2½-3 ft channel rock chip sample finishing the outcrop beforemoving 30' South to the next outcrop to be sampled. The rock is divided almost in half by a portion ~½ on the west side that is very strongly qtz veined. The eastern ½ is for the most part barren of qtz veins. The rock is green propylitically altered volc rock. Trace FeOx stained (hem & limon).

84047PRØ-63(11)5

5 ft. channel rock chip sample allong a discontinous outcrop. By jumping around a continous sample was collected. The outcrop has more qtz veins than is visple uppon 1st examination. Qtz veining is weak through the outcrop. The veins often have vuggs w/ druzzy coatings. The rock seems to be wkly silicified. It is green propylitically altered volc. Trace FeOx stains in patches on the surface of the outcrop, hem predominates (accessorys limon)

84048PRØ-33(11)5

5 ft channel rock chip sample. The sample is off set about 12'. The rock is grey wkly argillized & wkly propylitized. The rock is wkly qtz veined. random stringers of qtz throughout the outcrop. The outcrop is wkly FeOx stained w/ hem & limon. trace jarosite(?)

84050PRØ-63(13)5

5 ft rock chip channel sample, ⅓ of the sample (east ⅓) is wk-mod. qtz veined. The western ⅔ of the sample wich is offset about 10' north of the east ⅓ is very strongly qtz veined. Some crackle brecciation is present in both portions of the sample. The qtz veins are massive "bull qtz" voggs are present in the veins. These have druzzy qtz xtls. The rock is light green. Plopylitically altered volc. Trace FeOx staining (Hem, limon, & jarosite?)

84051PRØ-31(13)5 Resample 83-81

5 ft rock chip channel sample across outcrop of strongly silicified volc. rk. The rock is strongly qtz veins. The rock appears to be brecciated. Druzzy qtz xtls coat cavities & voggs. The outcrop is wkly FeOx stained, hem & limon.

84052PRØ-31(13)5

5 ft rock chip channel across a knob outcrop that is strongly silicified, strongly crackle brecciated, & strongly qtz veined. Wkly FeOx stained on fract surfaces only.

Bill Mitchell July 3, 1984 (TUE)

MHP went to Denver after Lunch today will phone (FRI).

84055PRØ-31(13)5

5 ft rock chip channel sample about 20' N. of 84054PR. Most of the sample (85%) is strongly silicified with no text. The remaining portion is wkly-mod. silicified & has a volc. text. The rock is strongly qtz veins w/ voggs & cavities often covered w/druzzy qtz xtls, Trace hem limon & jarosite(?) FeOx staining.

84057PRØ-31(13)5

5 ft rock chip channel across an outcrop of strongly silicified

ouch!

rock, textureless. Strongly qtz veined to where it looks brecciated. Wkly FeOx stained (hem, limon, jarosite).

84058PRØ-34(12)5

5 ft rock chip channel sample up an outcrop of wkly argillized & mod.-strongly silicified grey volc. rock. The outcrop is mod.-strongly qtz veins. Wkly FeOx stained on fract surfaces.

84059PRØ-34(13)5

5 ft rock chip channel sample up an outcrop (continued from 84058PR). The rock is wkly argillized strongly silicified & strongly qtz veined. Many qtz veins are vuggy & have cavities w/lazy qtz filings. The area of sample w/ the most argillization has the best volc. text.

84062PRØ-32(11)5

5 ft rock chip channel sample up an patchy outcrop about 20' N of 84061PR. The rock is grey wkly-mod argillized. Trace qtz veins in a volc. text rock.

84063PRØ-32(11)5

5½ ft rock chip channel sample up an outcrop about 15' N of 84062PR. The rock is wkly argillized & patches of mod silicification occur. The rock is wkly qtz veined. Trace FeOx stained on surfaces only, (hem/limon).

Bill Mitchell July 4, 1984 (WED)

INDEPENDENCE DAY

Ripped a chunck of rubber out of tire tread on Toyota trying to climb steep hill, had to change tires. Couldn't make it up the hill.

Clear blue skys, little breeze, Hot.

84066PRØ-GØ81

5 ft rock chip channel sample about 15' up the hill (west) of 84065PR. No alteration except trace argillization can be found. No qtz veins were observed. (but they are east & west). Wkly FeOx stained (hem) near & on surfaces.

84067PRØ - 32(11)5

5 ft rock chip up an outcrop of low relief. The rock is gray wkly argillized volc. w/ wk-trace qtz veins. Trace FeOx stain on fract. surfaces only.

84070PRØ - 32(11)5

1 ft rock chip channel sample. The rock is gray wkly argillized volc. rock. The sample is wkly qtz veined w/a swarm at its eastern boundary. Weak FeOx stain (hem) on fract. surfaces only.

84071PRØ - 32(11)5

5 ft rock chip channel. There is a gap in the western progression of samples of about 4-5'. The rock is gray wkly argillized Volc. Qtz veining is weak but uniform veinlettes throughout. Wkly FeOx stained w/ hem. on fractures.

84072PRØ - 34(13)5

3 ft rock chip channel across gray slightly silicified wkly argillized strongly qtz veined rock. Wkly FeOx stained (hem) on fract. surfaces only. Many cavities & drusie qtz in vein network (stockwork)

(THUR)

Bill Mitchell July 5, 1984

Partly cloudy, slight breeze & hot.
Toyota didn't make it up the hill again today.

84074PRØ - 51(13)5 (Resample of 83033PR)

5 ft rock chip channel sample across outcrop wich was grab sample #8333. This sample begins an aprox. north south series of 5 (five) continous samples. The rock is textureless massive silica w/ strong qtz veining. Wkly FeOx (hem) stained on fract. surfaces only.

84075PRØ - 51(13)5

5 ft rock chip channel sample. The rock is strongly qtz veined. Strongly silicified & wkly FeOx stained (hem) on fract. surfaces. Some veins are vuggie often with developed XTL growth, these are

often coated (stained) w/hem.

84076PRØ-31(13)5

5 ft rck chip channel of gray volc. rock with strong stockwork qtz veining that has undergone mod-strong silicification. The sample is wkly FeOx stained (hem) on fract surfaces only. Trace or beginning propylitic alteration is observed speckled through the sample

84080PRØ-3255

4½ ft rock chip channel sample across an outcrop with very low relief. The rock shows a volc. text. posibly a lithic tuff. The outcrop has a non-uniform concentration of weathered pyrite. In some instances the pyrite has been removed leaving a cavity with a hem. ora & in some places the pyrite has been replaced by Hem. There is also wk qtz veining in this sample some qtz veins are <1mm. Some have terminate xtl growth. Wkly FeOx stained w/Hem & Jarosites

There are lots of thick dark Thunder clouds to the west moving east or building? Rain. showers.

84081PRØ-3255

4½ ft rock chip channel sample. This sample is adjacent to the north side of sample 84080PR. The rock is symellar to that of the previous sample. The rock is a lithic tuff with areas of replaced or removed pyrite. Qtz veining is stronger than that in 84080PR but it is still less than 10% (weak). Some qtz veins are up to 15mm. Trace FeOx stain on fract surfaces & around blebs where pyrite previously was.

84082PRØ-34(12)5

4½ ft rck chip channel sample wich leads across the North side continuation of the same outcrop from wich 84080PR & 84081PR were collected. The sample is of the same rock type as the previous two samples. Pyrite does show through the sample as does some barite (weak). Qtz veining is mod-strong with ruggs often coated w/(Hem) FeOx as well as on fract. surfaces.

Bill Mitchell (FRI) July 6, 1984

PHONED MARK. SPOKE OF SAMPLING FURTHER WEST AROUND SAMPLES #83148 & 83151 & WORKING BACK TOWARD AREA JUST COVERED.

Cloudy skys, but they are moving east, smokey from fires N. of Reno, that w/ slight breeze.

Marked out more sample locations in a pyrite stockwork area that appears to be an extention from the outcrop where 83033PR is located. There is a prospect pit at this location.

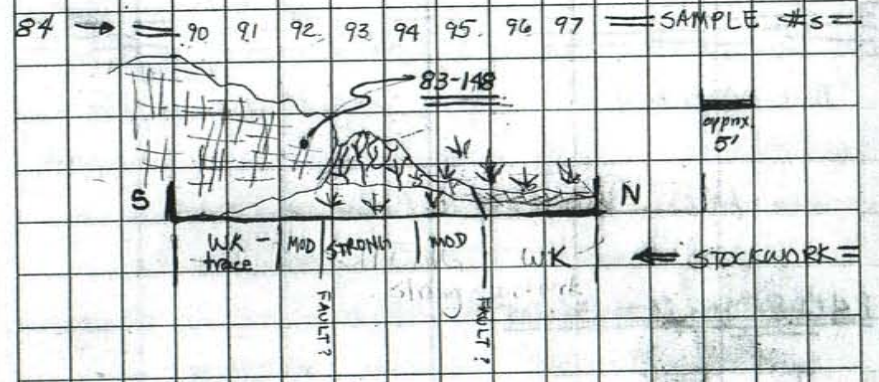
The remaining portion of the day was devoted to plotting sample locations on the base map photo. A smaller scale photo would greatly aid in this endever for not only is the present photo unclear but the obscure outcrops are difficult to locate & samples plotted.

Thunder storm moving over our heads. It looks to be a long one, has been building all day.

RENO SAMPLES 84043PR - 84085PR
7/6/84 to Reno

Bill Mitchell (TUE) July 10, 1984

Located 83-148 know about where 83-157 is located. These are relatively ↑ anomolies to which we will do some follow up sampling.



84090PRØ-63(11)5

5 ft rock chip channel sample. The sample is wkly propylotized volc. rock. Weakly trace qtz veinlettes are present. The rock is green-gray with brown FeOx staining (mod) on fract. surfaces.

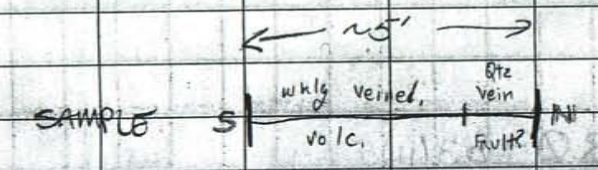
84091PRØ-33(11)5

5 ft channel sample rock chip. The rock is gray propylitically altered volc. wkly FeOx stained (hem) on fractures & Geothite in veinlettes. Wkly qtz veined. Well fract. (blocky).

Bill Mitchell (WED) July 11, 1984

Clear blue skys hot w/ breeze

84092PRØ-33(12)5



5 ft rock chip along gray volc. rock which is wkly qtz veined w/ veinlette size materials. The north side of the sample is massive bull qtz along a plane which apears to strikes N80°W & dips 75° N. [Mag. dec. is set on 17° E of N] This qtz veining does not appear to be continous to the east.

84093Ø-31(12)5

5 ft rock chip channel beginning on the south side for about 18" of solid bull qtz. This grades into the outcrop of mod. qtz veining. The rock where observed is gray volc. The outcrop is mod FeOx stained by hem, limon. & geothite.

LOOKING FOR 159 182204 166405

Found 159 at base of large wkly qtz veined outcrop in creek. Went up to adit which explores fault. Dump sample 124 & adit sample 125 are located here. There is a door about 25' from entrance to adit. The rock here looks very good. propylitically altered strong qtz veining & sulfides.

Across the canyon from the previous adit is another. This adit is at a higher elevation than the previous. This tunnel is but 30' long. Two wheelbarrows are in this adit. The rock is propylitically altered tuffs? Mod-strongly qtz veined. Jarosite is present on surfaces. 83122 location.

Frustrated I haven't found 83-151.
153 & 154 are on the same stake
on the tailings of a 25' deep tunnel
It looks to explore a fault. A wooden
wheelbarrow is in this one. 150 is
located west & a little north of 149.
This led us (Robert & I) in the right
direction.
83-151 is on its west side 30' N. from the
adit where 153 & 154 are located. This
is not where these are plotted
on the sample location map.
Now that we have located 151 tommorow
we will go direct & sample up hill
toward 148.

Bill Mitchell July 12, 1984 (THURS)

Picked up Ted Kavanagh at Reno airport
last night 7/11/84. Mark missed phone
& will be in today.

Partly cloudy, strong breeze not real hot.

White – Hg paper
Boyal – zoning of Au/Ag ratios.

Met with Saint Joe Minerals at
Howards Cafe (Fernley, NV) at 6 AM.
Jim McGregor & Glen
(these guys are working w/ Dick Nelson
they call him "The Assassin" a fitting
name). This Piute property was
offered them for J.V. a few
years ago. They were not interested.
Now they are but I don't think
Denison is at this time. These
guys are looking the property
over & collecting a few samples.

84098PRØ-63(11)5
5 ft rock chip channel sample which
begins a line of samples which
will pass near 83151. The area
sample appears to have more
qtz veins than those at 151. The
rock is propylitically altered
tuff. Qtz veining is wk-mod

84098PRØ-63(11)5
5 ft rock chip channel sample
through wkly propylatized tuff

Wkly qtz veined in little veinlettes. FeOx stain on joints surfaces only, some grade ¼-½" into the rock (tem/limon). Some of the qtz veins are vuggy w/drusy qtz.

84100PRØ - 33(11)5

6 ft rock chip channel sample. The rock is gray tuff. Wkly qtz veined by FeOx stained veinlettes. The rock is wkly FeOx stained. Wkly silicified?

Mark made it. He & Ted are flagging drill roads. They will prepare a report & have it into the BLM by tomorrow afternoon. After which they will go to Mina, NV & look @ the Pilot Project, Drew Mine.

84104PRØ-31(13)5

5 ft rock chip channel sample across a 3 ft wide section of very strong qtz veins. Most of the sample is silicified, although patches are less & still show volc text. (tuffaceous) There are patches w/in the qtz vein in which there are blebs of sulfides. Other areas show blebs of geothite where sulfides have weathered out. The Outcrop is mod. FeOx stained on fract surfaces. The qtz veining is multi episodal. A fault runs through this sample at which the veining is strongest.

N 20°W 50°W

Robert took samples to Reno FRIDAY 7/13/84 TOTAL 19

84086PR - 84104PR

Reno 7/13

Bill Mitchell July 16 1984 (MON)

7/16

Hazy blue skys. Hot w/slight breeze.

Continuing sampling where left off. The resampling of 83-151 & working up hill toward 83-149.

84105PRØ- 63(13)5

5 ft channel sample allong outcrop of trace-wkly silicified propylitically altered greenish tuff. The outcrop is strongly veined, the veinlettes carry barite in some places. FeOx stain is patchy although mostly wkly stained w/Hem & limon. There are strong patches, some include geothite. This staining is on fract surfaces & on druzzies in qtz vein voggs.

84107PRØ- 33(11)5

5 ft rock chip channel sample. The outcrop is for the most part wkly qtz veined. There is an area on the west side of the sample which is mod. qtz veined. This area carries large (incomparison to nothing) amounts of Barite. Some of these xtls are up to 3/8" wide & appear to fill ups cracks in the rock. This sample is located next to the tree on the a nondescript outcrop east of the adit & sample 83-52&53. The adit has a wooden wheel barrow. wkly FeOx stained.

1521/1537.

84109PRØ- 31(11)5

5 ft rock chip channel across a outcrop w/ low relief. The rock is grayish green propylitically altered. Wkly - Mdly silicified & Wkly qtz veined. There is a zone a few inches wide through the center of the sample which is more strongly FeOx stained. This area looks to have a weak crackle breccia text. Hem stain accentuates the fracts & qtz veinlettes. Barite xtls are also found in veinlettes in this area.

84112PRØ-31(12)5

5 ft rock chip channel sample the rock is wkly propylitized, Mod silicified & partly crackle brecciated. w/FeOx stain in matrix. Geothite is wkly present. Hem. is mod. Pyrite was observed in a single veinlette. In places the silicification has obliterated the text. A linear breccia zone runs

through the outcrop. It is roughly 1 foot wide but it appears to pinch & swell. This feature strikes N 80°W with an apparent near vertical dip.

84114PRØ-31(12)5

5 ft rock chip channel sample on the North end of another outcrop. The rock is propylatized(?) mod. silicified w/ areas of strong qtz veining. For the most part qtz veining is mod. FeOx stain is mod Hem & geothite on fract. surfaces. Well fractured rock.

Bill Mitchell (TUE) July 17, 1984

Those guys from Saint Joe left this morning. — I FORGOT TO GET MY ALTIMETER LOANED THEM, I WASN'T EXPECTING TO SEE THEM & COMPLETELY FORGOT, UNTIL NOW

Cloudy today, hot w/ very slight breeze, Muggy

Filled out salarie dist sheet & expense report. this morning.

84117PRØ-31(11)5

5 ft channel sample rock chip along outcrop. The rock is mod. silicified tuff. Some areas usually along fractures are strongly silicified there are patches of dark gray rock in these strongly silicified areas which have very fine pyrite desiminated through the patch. FeOx stain is mod strong, it is found on fract. surfaces. In some portions geothite has fill fractures to appear like a veinlette. There are patches of rock usually oriented w/ local structure which is vuggie & strongly FeOx stained.

84118PRØ-31(13)5

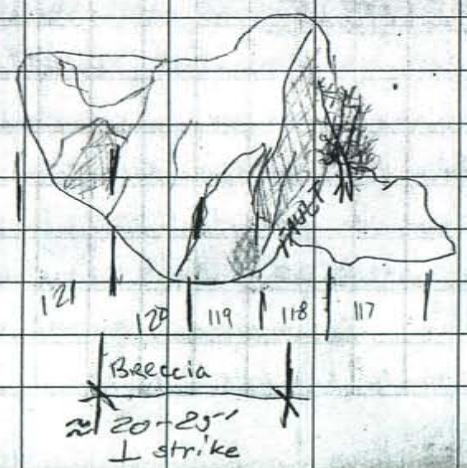
5 ft rock chip channel sample. The rock is strongly brecciated tuff. Multiple episodes of brecciation have occured. Strongly qtz veined Mod-strongly FeOx stained on fract surfaces. The sample appears to be a fault which strikes N 70E & dips 70N.

84119PRØ-31(13)5

5 ft rock chip channel sample. South of previous sample, connected. This sample is strongly silicified, strongly qtz veined. Strongly brecciated. Silicified tuff. Mod-strongly FeOx stained (Hem & limon) one patch of outcrop is very voggie-porous w/heavy FeOx stain.

84120PRØ-31(13)5

5 ft rock chip Channel sample. This sample is connected to the two previous samples. It too is brecciated with evidence of multiple episodes. The tuff has been strongly silicified as well as strongly qtz veined. FeOx stain is moderate on fract. surfaces & staining portions of the rock where porous (minor).



Bill Mitchell

(WED) July 18, 1984 7/18

Thick high clouds moving over. Hot & humid. breeze blowing.

84123PRØ-34(11)5

5 ft rock chip channel sample. I had to jump around a bit to get a continous sample. The rock is wkly argillized & wkly silicified. Highly fractured gray tuff. One area with qtz veins was incontered this area was no more than 1½'; wkly qtz veined, wkly FeOx stained w/hem & limonite.

84124PRØ-31(12)5

5 ft rock chip channel sample. The rock is a gray tuff. A linear apparent that cuts diagonally through the sample is mod-strongly silicified w/multiple episodes of qtz veining over all qtz veining is mod. The balance of the sample is wkly argillized & wkly silicified. Wkly

- mod. FeOx stained. Mod on fract. surfaces.

84125PRØ-64(11)5

5 ft rock chip channel sample up a green wkly propylitized tuff. The rock is wkly argillized & wkly-strongly silicified. The strongly silicified portion is a narrow (3") wide ridge of rock that is not very continuous. It is wkly qtz veined (but strongly silicified). FeOx stain is heavy in this area. FeOx (hem & limon) on fract surfaces & in vuggs.

84128PRØ-63(12)5

5 ft rock chip channel sample at the base of an outcrop about 20' west of 84127PR. The rock is wkly propylitized wkly brecciated, Mod qtz veined. Wkly FeOx stained green tuff.

84129PRØ-63(11)5

5 ft rock chip channel sample up outcrop. The rock is green propylitically altered tuff. The rock is mod-strongly silicified. Wkly qtz veined. Fract surfaces are mod FeOx stained, portions of the rock are heavy & limon. stained brown.

84132PRØ-34(11)5

5 ft rock chip channel sample of gray tuff, wkly argillized wkly silicified. Wk FeOx stain on fract surfaces. Highly fractured. Wkly qtz veined

-RAINING.-

84133PRØ-34(11)5

5 ft rock chip channel sample. The rock is a gray tuff w/ FeOx stain on fract surfaces. Wkly propylitically altered. Wkly argillized & silicified. Wkly qtz veined.

Poured rain tonight for two hours in Fernley, NV, Flooded parts of town upto 20" standing H_2O in street.

Bill Mitchell (THURS) July 19, 1984

Early AM clear blue skys, the sun is hot slight breeze, "dot" clouds are building over our heads.

84134PRØ-63(11)5

5 ft channel sample rock chip, Green Mod propylitically altered tuff. Wkly qtz veined, Wkly FeOx stained (Hem) on fract. surfaces only.

84135PRØ-63(11)5

5 ft rock chip channel sample. The rock is green mod. propylitically altered tuff. Wkly qtz veined, wkly FeOx stained on fract surfaces (hem). Well fractured.

84136PRØ-63(11)5

5 ft rock chip channel sample. The rock is greenish gray wkly argillic wkly-mod. propylitically altered. Wkly qtz veined & wkly FeOx (hem) on fract. surfaces

84137PRØ-33(11)5

5 ft rock chip channel sample. The rock is gray wkly argillized wkly propylatized tuff. The rock is still very wkly qtz veined w/type veinlettes. The rock is wkly FeOx stained (hem) on fract. surfaces.

84138PRØ-63(11)5

6 ft rock chip channel sample. The rock is green mod-wkly propylatized, Wkly FeOx stained (hem) & wkly qtz veined. & Well fractured.

84139PRØ-63(11)5

5 foot rock chip channel sample. The rock is propylitically altered green tuff. Qtz veining is wk. Trace-wkly FeOx stained on fract. surfaces.

Just had a large T-storm. Poured rain lightning all around

84140PRØ-63(11)5
4½ ft channel sample rock chip. The rock is green mod propylitically altered tuff. Qtz veining is weak. One hem. stained vein of geothite(?) was observed.

84141PRØ-63(11)5
5 ft channel sample rock chip. The rock is green mod propylitized tuff. Weakly qtz veined. Wkly FeOx stain on fract. surfaces

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Bill Mitchell July 20, 1984 (FRI)

DROVE TO LUNCH TREE BY SOUTHERN ROUTE. FAMILY WAGON MADE IT UP ROAD!!
AM Clear blue skys, breeze, "dot" clouds building into T-clouds

This week was the Democratic convintion in San Francisco, CA; Walter Mondale & Geraldine Farraro are P&VP candidates, beating out Gary Hart & Jesse Jackson. They will run against President Regan.

84150PRØ-31(11)5
4½-5 ft rock chip channel sample in gray well fractured wkly propylitically altered tuff. The rock is wkly qtz veined. Wkly FeOx stained (hem) on a few fract (jointed) surfaces. Wkly siliified.

84151PRØ-31(11)5
5 ft rock chip channel sample The rock is gray wkly propylatized wkly silicified, wkly qtz veined & wkly FeOx stained on fract surfaces & joints. Well fractured outcrop.

84152PRØ-31(11)5
5 ft rock chip channel sample. The rock is gray wk-mod silicified wkly propylatized tuff. Wkly qtz veined. Well fractured, wkly FeOx stained on fract surfaces.

84153PRØ-34(11)5
5 ft rock chip channel sample. The rock is wkly silicified & wkly-mod argillized. Where mod argillized FeOx stain is mod, elsewhere it is weak. Qtz veining is weak.

Lost 1" chisel as I sat & wrote this sample up. I don't know if it rolled down hill or was covered. I had to go uphill & mark next 4 samples(?)

84154PRØ-33(11)5
5 ft rock chip channel sample across gray: wkly silicified, wkly propylatized tuff. Qtz veining is weak as is FeOx staining (hem) on fract. surfaces.

The next sample along this traverse uphill is 84097PR this group through 84090PR resamples 83-148 84155PR resumes the traverse up the hill past 84090PR

84156PRØ-63(11)5
5 ft rock chip channel sample across mod-well fract ~~ra~~ tuff. Mod propylatized, wkly-mod qtz veined some goethite in veinlettes. Hem-limon. (jarosite(?)) on fract surfaces only.

6/20 RENO

RVL. to Reno w/ sample #s
84105PR to 84156PR
TOTAL OF 52 samples

(SAT)
cartoon day
Bill Mitchell July 21, 1984

AM: A few clouds, mostly sunny, cooler than it has been, slight breeze. "Dot" clouds building into big T-clouds.

TRYED TO GET TO LUNCH TREE BY SOUTHERN ROUTE COULDNOT. MADE IT UP THE ROAD. I WONDER WHY?

84157PRØ-63(12)5
5 ft channel sample rock chip. The rock is green mod propylatized tuff. wkly qtz veined except for the northern end of the sample which is about 10-12" of qtz veining. The outcrop is wkly-mod FeOx stained on fract surfaces. Veinlettes of goethite(?) are in the strongly qtz veined portion.

84158PRØ-63(11)5
5 ft rock chip channel sample. The rock is green mod propylatized tuff. The rock is wkly qtz veined but not tracely. Some areas usually following a planar structure are mod silicified for about 1-2" across. These areas usually have veins in the area but they do not necessarily correspond.

84159PRØ - 33(11)5

5 ft channel sample rock chip. Greenish gray wkly propylatized rock chip sample of tuff. Wkly qtz veined There is a 3-4" qtz vein that is carrieing 2-3% sulfides in dark patches & as isolated xtls. This appears to be isolated. Wkly FeOx stained w/hem & jard(?) & limon on fract surfaces.

84160PRØ - 63(11)5

5 ft rock chip channel sample grayish green wkly propylatized tuff. Wkly qtz veined. Wkly FeOx stained w/hem, limon, & jarosite(?).

Bill Mitchell July (SUN) 22/84

Mostly clear in am: dot clouds growing to T-heads in PM slight shower breezy hot-warm.

84161PRØ - 33(11)5

5 ft channel sample rock chip. Sample is gray slightly propylatized tuff. Wkly qtz veined. At south end of sample is a mod silicified portion about 1 ft wide that appears to be the edge of the altered area for this traverse.

The next traverse will begin at approx. the same elevation but eastward about 50'. This will continue down slope across the zone moving across a qtz vein which appears to be an eastward extention of the vein sampled @ 83-148.

84162PRØ - 63(13)5

5 ft rock chip channel sample. This sample begins the ~~east~~ southward extent of a new traverse northward. It appears to begin at a fault which strikes N 65° W & dips 53° S. There is a very strongly qtz veined area

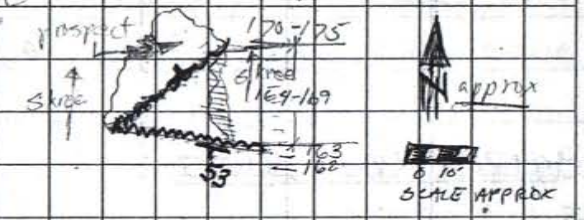
about 2½' ft thick along the fault plane. W massive qtz on the fault plane. Away from this is a mod qtz veined area which is green propylitically altered tuff. Cavities are numerous in the veins. Wkly FeOx stained (hem) cubic cavities ~2% along fault w/FeOx stains grade outward rapidly.

84163PRØ-G3(11)5

5 ft rock chip channel sample. Rock is green mod propylitically alltered tuff. Wkly qtz veined. It appears the strong veining was associated w/ the fault. Wkly FeOx stained hem & geothite(?) on fract surfaces only.
-RAINING-

MARKED out further samples down slope. The ~~qtz~~ silicification & veining branch on the western side of this outcrop the east side will be sampled samples 84164-84169 will cover the very wkly qtz veined area

between the areas of strong silicification see sketch



(MON)
Bill Mitchell July 23, 1984

Cloudy in am. (starting early) cool when driving hot in sun but cool breeze-wind. looks threatening.

84168PRØ-3Ø(11)5

5 ft rock chip channel sample. The rock is a greyish tan fresh looking tuff. Very wkly qtz veined. Veins present are FeOx stained & have druzy qtz. Wkly FeOx stained, Mod on fract surfaces.

84169PRØ-G3(11)5

5 ft rock chip channel sample through ~~the~~ green-grey mod-strongly propylatized tuff. wkly

qtz veined, wkly FeOx stained. What looks to be replaced & removed pyrite 2-5% of rock on the northern edge of sample. Which is next to a silicified fault plane.

84170PRØ-63(12)5

5 ft rock chip channel sample. The sample begins at a silicified fault (!) & continues north. through mod propylitized tuff (containing gungy garnet brn & grn(?)), Here the rock is mod qtz veined w/(n) 2% qtz Mod-wk FeOx stain (hem, limon, & jarosite?).

84171PRØ-63(12)5

5 ft rock chip channel sample. Sample is green propylitically altered tuff. Mod qtz veining. w/wggs. Sulfide (pyrite) are present throughout the sample but concentrated in patches. in silicified areas. FeOx stain is wk-mod. on fract surfaces.

84172PRØ-63(13)5

5 ft rock chip channel sample. Rock Sample is green mod-strong propylitically altered. Strong qtz veined. 5-10% sulfide, much of this has been removed or replaced w/ FeOx.

Dear Diary: Grey clouds obscuring ~~the~~ ridge top of Range moved in on us fast forcing our retreat through the rain to the small adit where 83-52, 83-53 is located. The winds blew H_2O into the tunnel. 10-12'.

84173PRØ-33(12)5

5 ft rock chip channel sample. Rock is wkly-mod propylitically altered tuff. Mod. qtz veined, wkly FeOx stained.

(TUE)

Bill Mitchell July 24, 1984

Partly cloudy, warm, hot in sun, breezy, det clouds growing.

84174PRØ-33(11)5

5 ft rck chip channel sample. The rock is wkly propylatized tuff. (gray). Wkly qtz veined (trace) Wk FeOx stain on fract surfs.

84178PRØ-33(12)5

5 ft rock chip channel sample. Gray wkly propylatized tuff. Mod. veined w/qtz. Mod FeOx staine predominantly on fract surfaces (hem & limon).

84180PRØ-33(12)5

3 ft rck chip channel sample. Strongly qtz veined for about 10" on southern margin. The balance is Greenish gray, propylitically altered tuff. Mod-qtz veined Wkly FeOx stained.

DN 24GC (WED)

Bill Mitchell July 25, 1984

Clear blue skys, breezy, expecting it to get hot.

84183PRØ-33(11)5

3½ ft rock chip channel sample. (5 lateral ft) The rock is gray wkly propylatized tuff. Very wkly qtz veined. Wkly-mod FeOx stained (hem, limon, & jarb.) on fract surfaces, some geothite.

DN 20AC 7/25/84

Went to Bridgeport, CA

Met Joaha Gaffney (Realtor) know have will be moved out of house by the end of August.

Went out to Ruf-Sun property where Grant Smith is restoring drill roads to original topographe. The roads were the two pushed in at the Sierra Wild River land". Met him 0.4 mls west of sight. We went back & looked over

DN 20AG

he went back w/ Dozer & moved a little more dirt on the first turn of the upper road & at the first "swale" on the lower road. The results were very pleasing. There is one area on the upper road where there is a small gap between cut & fill pushed back to it. In this area large rocks prohibit grooming of the surface. It is my opinion that the soil which is presently thick dust around the fill will eventually level out this small gap as rain & wind proceed. Also what little cut is present should slough down into the gap.

Took Smith back to ranch across river & he dropped off his P.U. I then took him back to his Dozer where he proceeded out. — return [B]

(THURS)

BILL MITCHELL JULY 26, 1984

Clear. Blue skys, expected to be hot. Warm & breezy.

MHP. Met with David from Coat

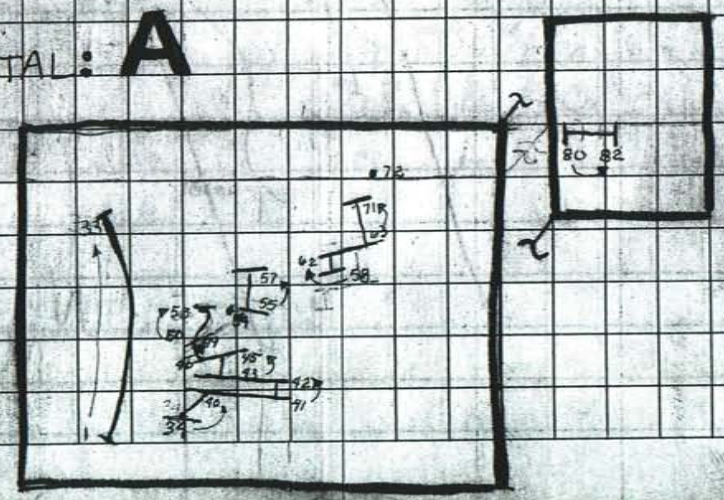
A core (diamond) drilling company to look over access & for bidding purposes.

Yesterday (7/25/84) MHP met with a core driller.

He said he could not get his 3/4 ton P.U. mounted rig up steep hill to pad locations.

LOCATED SAMPLES ONTO PHOTO

DETAIL: A



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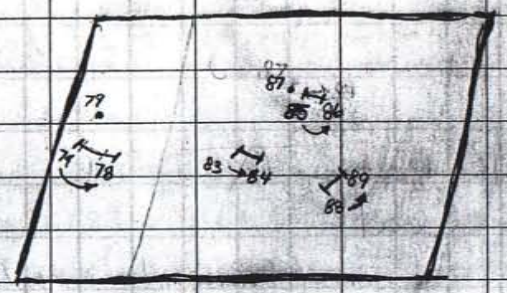

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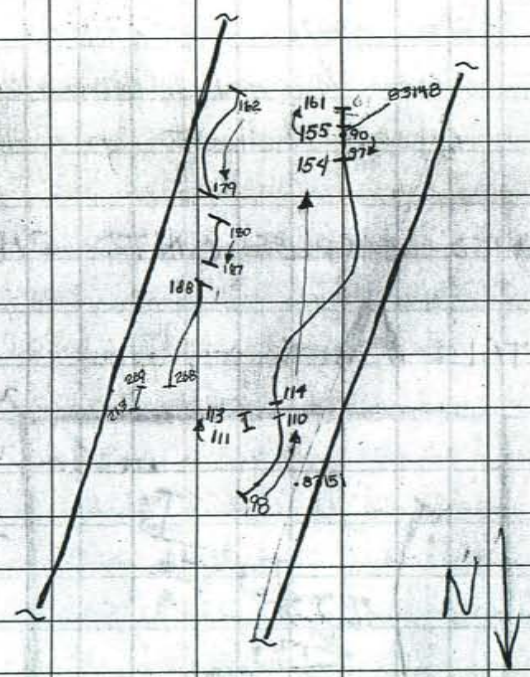


84198 PRØ - 33(11)5

2½ ft rock chip channel sample. The sample is gray, wkly propylitically altered tuff. The sample is wkly qtz veined. Wkly - mod FeOx stained (hem & limon) on fract. surfacies.

84200 PRØ - 33(11)5

5 ft rock chip channel sample. The rock is gray, wkly propylitically altered wkly - mod FeOx stained (hem & limon)

(FR) 7/27

Bill Mitchell July 27, 1984

PREPARED EXPENCE ACCOUNTS.
Partly cloudy frontal clouds, breezy, hot & warm.

84204 PRØ - 63(11)5

4½ ft rock chip channel sample. The rock is gray wkly-mod. propylitically altered wkly qtz veined. Mod FeOx stained on fract surfaces (hem & limon.) Possible Barite.

84207 PRØ - 31(11)5

5 ft rock chip channel sample. The rock is rimmed w/ SiO_2 (strong) the rest

of the rock is mod. Qtz veining is wk (to mod.) FeOx stain (hem, limon, & jaro) on fract. surfaces. The rock is gray. Stain (FeOx) is mod-strong on fract surfaces only. Pyrite is present (trace).

RENO 7/27

MH, P. to Reno w/ samples
84157PR – 84210PR
TOTAL 54 SAMPLES

84211PRØ-31(11)5

4 ft rock chip channel sample. The rock is gray mod silicified tuff. The nature of the silicification is a strongly-modly silicified margin allong surfaces with a less silicified interior. Pyrite is observed in trace amounts in dark patches of rock. The sample is wkly qtz veined. FeOx stain is wk-mod. w/ hem, limon, & jaro. (?) on fracture surfaces.

Build up of clouds to the east w/ lightning @ dusk.

(SAT)

BILL MITCHELL JULY 28, 1984 7/28

Clear blue sky for the most part. Clouding up in PM, Hot w/ breeze.

84212PRØ-31(11)5

5 ft rock chip channel sample. The rock is gray wkly-modly silicified. wkly (-mod) qtz veined. Mod FeOx stained w/ hem, limon, & geothite. (& jarosite (?)) on fract. surfaces & veinlette surfaces.

84213PRØ-31(11)5

5 ft rock chip channel sample. Rock is wkly silicified. Wkly-mod qtz veined gray tuff. Thin (1/4-3/4" thick) crackle brecciated planer structures are present. These are cemented by SiO_2 & FeOx (hem & geothite). FeOx stain is mod hem, jaro (?), limon & geothite on fract surfaces.

84214PRØ-31(11)5

5 ft rock chip channel sample. Rock is grey wkly silicified tuff. Wkly-mod qtz veined. There is an area of gouge of which about 1 ft was collected from.

FeOx stain is wk-mod w/hem, geoth, limon & jarosite(?) staining on fract surfaces.

84215PRØ-31(11)5

5 ft rock chip channel sample. The rock is gray mod-strongly silicified tuff. Wkly (mod) qtz veined. Mod-strong FeOx stain. hem, geothite, limon, & jarosite. Strong silicification appears to be isolated to a joint or fault plane in the outcrop.

84216PRØ-31(11)5

4½ ft rock chip channel sample. The rock is gray mod silicified tuff. Wkly qtz veined. Mod FeOx stained hem, limon, geothite & jaros(?).

84217PRØ-31(11)5

5 ft rock chip channel sample; The rock is gray mod ~~slt~~ (-wk/o) silicified tuff. Wkly qtz veined, w/ drizzy xtb on some cavities of veins. These are often FeOx stained. (supergene). FeOx stain is mod-wk hem, geothite & limon. on fract surfaces only. trace jarosite (?).

84218PRØ-31(11)5

5 ft rock chip channel sample. This sample is gray mod silicified tuff. Wkly - mod qtz veined w/ pyrite desimmed. In this area FeOx stain is mod-strong hem, limon, & jaros. FeOx on fract surfaces is mod. w/hem, geothite, limon, & jaros.

BILL MITCHELL JULY 29, 1984 (SUN) 7/29

PARTLY CLOUDY, MOSTLY SUNNY, WARM-HOT W/BREEZE; BUILDING "DOT" CLOUDS.

84219PRØ-31(11)5

5 ft rock chip cannel sample. This sample is gray mod. silicified tuff. Trace localized area of crackle breccia. Silicification is mod-strong. Strong appears to be on the surfaces of the rock. Pyrite looks to be removed w/ hem as stains around cavities. FeOx stain is mod, hem, geothite, limon, & jaros(?) on fract surfaces.

84220 PRØ-63(11)5
5 ft rock chip channel sample. The rock is wkly-mod propylatized, a grayish green. Wkly-mod qtz vein, one vein which runs through sample is 3-6" wide & continous. FeOx stain is mod-strong w/hem, limon, & geothite on fract. surfaces.

84221 PRØ-63(11)5
5 ft rock chip channel sample. The rock is light green mod propalitically altered tuff. Weakly qtz veined. Qtz veins often have druzzy filled cavities. FeOx stain is weak w/ limon. & jaros. (?) on fract surfaces. The rock is well fractured.

84222 PRØ-63(11)5
5 ft rock chip channel sample in well fract. rock @ the base of a fault plane. The rock is light green propyliticall altered tuff. Wkly qtz veined & wkly FeOx stained (hem, limon, & jaros(?)).

(TUE)
Bill Mitchell Aug 7, 1984 8/9

Sunny clear & hot w/breeze.

84261 PRØ-33(13)5
5 ft rock chip channel sample. The rock is gray propyliticlly altered tuff. The sample is strongly qtz veined. Barite is present. No sulfides observed

* * *

8/8

(WED)
Bill Mitchell Aug 8, 1984

Clear blue skys sunny & hot, cool mornings.
Roberto Lugo began his shift today.

MHP & I (w/TWE) will survey in sample locations of samples that ran good values Au & Ag.

Surveyed in #s 50, 60, 61, 72, 81, 99
106, 111, 112, 119, 135, 148, 155
162, 176, 193

84266 PRØ-63(12)5

5 ft rock chip channel sample. The rock is green propylitically altered tuff. Qtz veining is mod.-strong. Veinlettes wich include pyrite is also present. FeOx stain is mod-weak. hem, limon & jarosite.

84269 PRØ-31(13)5

5 ft rock chip channel sample The rock is propylitically altered tuff. Strongly qtz veined. W/ the last (northern) 18" of sample is massive qtz. No pyrite was observed. FeOx stain is weak on fract surfaces. hem, limon, & jaros(?) This sample concludes this traverse on a fault wich is located where an adit (w/ screen door) is located.

8/9

(THURS)

Bill Mitchell Aug. 9, 1984

Ptly cloudy, hot, slight breeze. Tclouds.

This stretch of samples is ~south of 84155 @ top of traverse. This sample ran .019 oz/ton Au.

84270 PRØ-33(11)5

5 ft rock chip channel sample. located south east (up hill) from 84155 on skree slope. The rock is wkly ~~alter~~ propylitized greenish gray tuff. Weakly qtz veined mod-strong on the southern margin, ~8-10". FeOx stain is mod-wk. w/hem, limon, & geothite.

84271 PRØ-33(11)5

5 ft rock chip channel sample. The rock is wkly propylitically altered greenish gray tuff. Qtz veining is wk w/ some FeOx stain. FeOx stain is wk-mod on fract surfaces & in some of the rock. hem & limon.

84272 PRØ-33(11)5

5 ft rock chip channel sample. The rock is greenish gray propylitically altered tuff. Qtz veining is weak, often FeOx stained. FeOx staining is wk-mod on fract surfaces & along veinlettes. (hem & limon). The sample & outcrops are very well fractured.

84276PRØ-33(11)5

5 ft rock chip channel sample. The rock is a grayish green wkly propylitized tuff. Qtz veining is weak. FeOx staining is wk-mod. w/ hem, limon, & geothite.

84277PRØ-30(11)5

5 ft rock chip channel sample. The rock is grey very wkly propylitized tuff. Very well fractured. Wkly qtz veined & wkly FeOx stained. hem, limon & jens(?) on joint surfaces. ( )

84278PRØ-30(11)5

5 ft rock chip channel samples. The rock is gray very wkly propylitized (?) tuff. Qtz veining is weak. FeOx staining is weak. ~~Fe~~ hem & limon on joint surfaces only.

BEGINNING OF A NEW TRAVERSE, THIS TRAVERSE STARTS ALMOST AT THE CREST OF THE RIDGE ABOVE 83-33. THIS TRAVERSE WILL CONTINUE NORTH, DOWN-HILL THROUGH 83-117 & 83-118.

84282PRØ-33(12)5

5 ft rock chip channel sample. The rock is greenish gray wkly propylitized. Mod. qtz veined. Veining appears to have a E-WEST strike w/ near vertical dip. FeOx stain is wk on fract surfaces & mod on joint surfaces. (hem, limon, geothite, & jarosite?).

84284PRØ-33(11)5

5 ft rock chip channel sample. The rock is gray wkly propylitically altered tuff. Wkly qtz veined. Wkly FeOx stained on fract surfaces mod on joints. (hem, limon, jaros(?) & geothite).

84286PRØ-33(11)5

5 ft rock chip channel sample. The rk is greenish gray propylitically altered (wkly) tuff. Qtz veining is weak - mod. w/ cavities & drusy qtz xls. FeOx stain is mod on joint surfaces. (geothite & hem.) wk on fract surfaces (hem, limon, & jarosite(?)).

84287PRØ-33(115

5 ft rock chip channel sample around the end of an outcrop. The sample is greenish gray propylitically altered tuff. Weakly qtz veined. Veins have cavities which have often FeOx stain. FeOx stain is mod on fract surfaces limon & jaros.(?). hem & goeth on joint surfaces. Outcrop is very well fract.

△ △ △ △ △ △ △ △ △ △ △ △ △

8/20 DN24GC MON

Bill Mitchell Aug 20, 1984

Met Ted in AM.

Went to Reno to
✓ get Map for Yerington Dist.
✓ Get tires for FW jeep
✓ fix heater hose

DN24DR

Bill Mitchell FRI 8-31-84 8/31

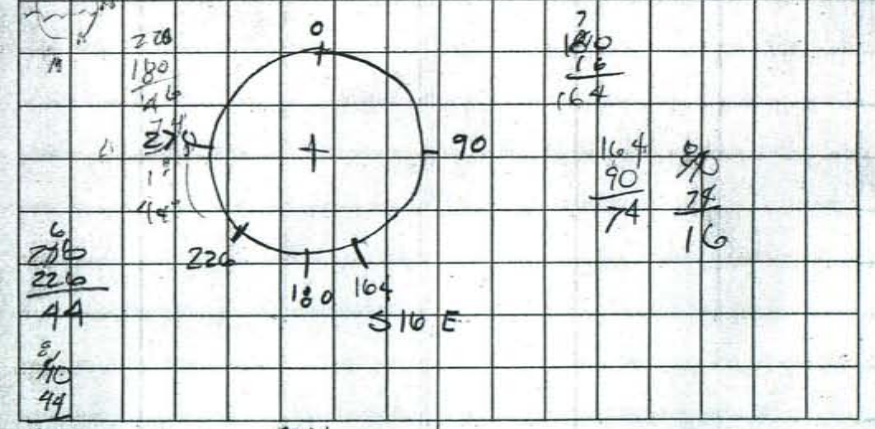
Went to drill 8:30AM sight w/ MHP picked up core boxes. Set up azmyth stakes for drill sight #2. Took MHP back to log core. Came back to set up on pad #2

★ Do not go past 200'

✓★ TELL Helper 25° hole will be 2a — acid test
the hole below it will be 2b
Next 25° hole will be 2c & 2d.

✓★ Acid end of hole (night shift)
★ Footage @ end of day.
✓★ Time of drilling

★✓ ASMITHS 164° S16E
226° S46W
25° 55° angles declination



Hole 3 N46° W @ 25°.

Began hole w/rotary bit about 3:00 PM 0 to 10 ft

Began diamond drilling @ 3:20 PM @ 10 ft

stop @ 4:00 PM @ 26 ft

had to adapt to underground type drilling because of shallow angle must pump core tube back down hole & core retriever.

Got back acid test. looks good.

Test for 1B @ 380'

9-1-84 Paiute Hole # 3A

DN24DR

RECOVERY

BILMIZOL (SAT) 9-1-84

0-10'	No Recovery
10-16'	
16-26'	
26-36'	80%
36-46'	83%
46-54'	100%
54-63'	78%
63-66	100%
66-76	37%

9-1-84 PAIUTE HOLE 3A

DN24DR S46W @ 25°

0-10' Recovery lost while starting hole & setting casing.

10-15.5' grayish-green str. argillized, bleached, wkly limonite stained

10-19' Will log later

15.5-19.0' same as 19-21.2

19-21.2' Massive gray-green clay. Trace FeOx, specks of limonite, & streaks of FeOx limon & jaros. No pyrite

21.2-23.6' Qtz veins & massive grayish-grn clay. Qtz veins are ⅛"-3" thick. Some vuggs are present with druzzy qtz xtls lining vuggs. Qtz veins shows signs of brecciation & recementing with clay & qtz. In these areas the qtz is mottled with greenish clay & brown FeOx (limon. & jaros.) stain. FeOx stain limon. & jaros. appears to be on fract. surfaces in the massive clay. No pyrite

23.6-29.6 ~~Symmetter~~ Similar to previous section except the following: It become less argillized w/ depth (mod to weak) except for a mod. silicified section in the center (1 ft long) & for a ½ foot section at the end which is strongly argillized, almost massive clay. The mod

9-1-84
DN24DR

silicified portion shows sighns of shearing with clay filling fractures. No Pyrite. Well fract

29.6 — 30.4 Wkly propylitized, greenish gray, Strongly qtz veined. Shows evidence of silica flooding (strong) Qtz veins are vuggie, show some fuzzy qtz xtls. The rock shows some volc. text. FeOx stain is mod. on fract. (limon & jaros.) No pyrite. Mod fract.

30.4-65.8 Green silicified tuff, mod. qtz veined. Green propylitic alteration (mod.), bleached out gray for upto ¼ in. allong some veins. This section is predomanantly mod. qtz veined. There are some areas of strong qtz veining (those will be located at end of description) Silicification is variable (mod-strong). FeOx stain is allong what appear to be joints & fractures. Mod-strong FeOx hem, limon & goethite & jaros. allong joints. Weak FeOx (limon & jaros) along fractures & some veins. Pyrite begins to appear @ 37.9 ft. Minor desemenated throughout rock & veins. Multi-episodal veins w/adjularia(?). Some qtz veins

[Agustus] — Canadyan Mineral Co. Gerry Lyne Prop. 9-1-84 DN24DR

stained w/limonite. (FeOx on qtz vein). ~~Once the pyrite show it appears to fade from trace to minor~~ ~~& back~~. Adolaria(?) "kite" in qtz veins. The "kites" (?) are cloudy shapes in qtz vein. Slicken side @ 47.4'. The last 2½ ft becomes bleached. The pervasive green color takes on a mottled appearance w/a pale grnish gray. Once the minor pyrite appears. The deseminated pyrite gradually over the whole 35 ft section becomes less, to trace, but pyrite remains minor in the qtz veins. Mod Fractured. Strong qtz veining occurs @ 30.4-31.7'

65.8 - 84' Similar to previous log but becomes mod. silicified @ end (84'). The rock is mod. qtz veining. Pyrite is trace. Mod. fractured w/hem/clay up to ⅜" thick.

Bill Mitchell DN 24GC (SUN) 9-2-84

9/2

Like the past week it is cool in the mornings. Some wispy high clouds in AM. Clear & sunny.

Continuing sampling down outcrop toward 83-117 & 118. This continues a continuous rock chip channel sample wich began about 3 samples above my sample # 84282.

84301 PRØ-3331

4½ ft rock chip channel sample the rock is gray, weakly propylitized lithic tuff. No qtz veins are observed. FeOx stain is mod on joint ~~fracture~~ surfaces (hem & geoth).

84302 PRØ-3331

5 ft rock chip channel sample. The rock is tannish-gray weakly propylitized lithic tuff. Mod. fract.. FeOx stain is mod. on joint surfaces w/hem & geothite stain (some places strong), weak limon stain on fract. surfaces.

84303 PRØ-3331

5 FT Rck chip channel sample. The rock is greenish gray lithic tuff. Patches of the rock carrie spots ho limon. desimen. through the rock. Not in sample itself. Some of these patches are more green & appear to carrie pyrite or remnants of pyrite (FeOx replaced). FeOx stain is mod. on joint surfaces, hem & geothite. The rock is well fractured.

9-2-84 PAIUTE HOLE #2A
DN24DR

169.7 – 225.0

"Gradually becomes less bleached, less argillized & color becomes reddish-brn due to increase hem. content in tuff matrix. No Qtz veining
At 174.0' onward the core is bleached to lt. gray color, and still wkly argillized. Ends @ 177.2'
Clay fracture fillings w/ minor blebs of Qtz in it at 175.7'.
Gray strongly silicified patch 2" in diam. at 177.0'.
At 179.7' color changes to med gray due to decrease in hem. content. Silicified pale grn patch with no texture preserved."
(M.H.P 1984, PAIUTE NOTEBOOK) 182.2-182.4'.

At 184.0' color change loss of hem in matrix to light gray.
Trace pyrite begins @ 188.0' cont. to 201.0'
At 194.1' it becomes minor for about ½ ft. Qtz clay, pyrite veins (weak) begin at 188.2 & continue through 195.5 with a ½ ft section of good qtz veining @ 194.5-195.0

Slight color change @ 196.5' to a light greenish-gray. Text. fracs for a few feet. probably due to a local fining variation
At 199.7 a ¼" wide clay seam shows.
Clay, qtz & pyrite veining 201.0'-205.0'
Begin to pick up hem veinlettes @ 209.0' and gradually becomes mixed as stain in the matrix at about 210.0' [(trace) & patchy]
Pyrite begins to show @ 210.0 ft (trace)
Propylitic mulization on fracs from 215.5 – 218.5' where hem. stain in matrix increases slightly reducing @ 218.5 w/ a slight show of propylitic min's on fract.
Pyrite veinlettes @ 224.5

DN24GC

(FRI)

Bill Mitchell

9/7

SEPT. 7, 1984

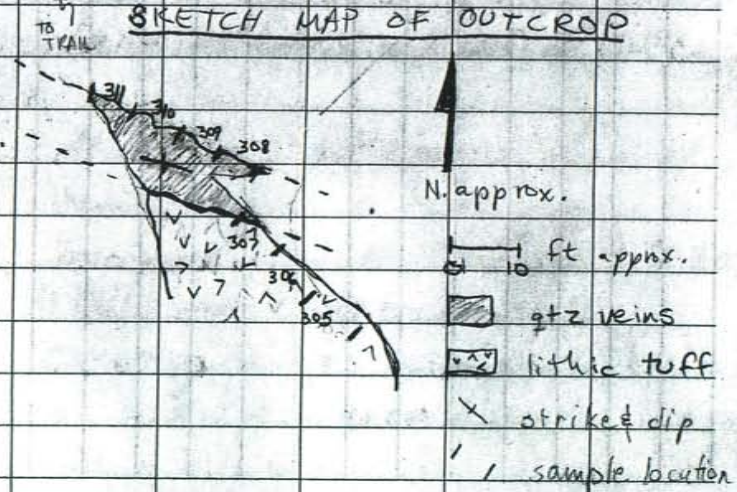
Mostly clear blue skys, some high wispy clouds to NE
Cool breeze, warm.

84304PRØ-3331

4½ ft rock chip channel sample. The sample is a weakly propylatized lithic tuff. FeOx stain is mod on joint surfaces (hem).

The following 7 (seven) samples will complete this traverse above the trail. It will resume below the trail. The following 2¾ samples are in the same wkly propylatized lithic tuff. The remaining 4¼ samples are along a ~10' wide qtz vein zone which strikes N 75°W & has a near vertical dip.

SKETCH MAP OF OUTCROP



84305PRØ-3331

5 ft rock chip channel sample of weakly propylitized lithic tuff. very well fractured FeOx stain is mod-strong (hem) on joint surfaces. Weak-trace jarosite(?) staining portions of rock.

84306PRØ-3331

5 ft rock chip channel sample. Weakly propylitized green lithic tuff. Highly fractured. FeOx stain is on joints Mod hem stain. Weak jaros.(?) stain of portions of rock. Patches of tuff are wkly silicified.

84307PRØ-3(12)5

5 ft rock chip channel sample. The rock is green wkly propylitically altered rock & massive qtz vein w/ voggs, drozy qtz & remnant pyrite replaced w/ spheroidal hem. FeOx stain is Mod. on joint surfaces & surfaces of veins. Fract in tuff is mod.

84308 PRØ-63(11)5
5 ft rock chip channel sample. The sample begins at an 8" qtz vein & continues into wkly silicified, green propylitically altered lithic tuff. FeOx stain is on joints (hem) mod fractured.

84309 PRØ-63(11)5
.5 ft rock chip channel sample. The rock is wkly silicified, olive green propylitically altered lithic tuff w/weak qtz vein stockwork. FeOx stain is mod on joints (hem) weak elsewere (jarosite?)

84310 PRØ-63(12)5
4½ ft rock chip channel sample through a stock work zone of propylatized green lithic tuff. Qtz veins or vuggie w/druzy qtz. FeOx is mod on joints & weak on fract surfaces.

84311 PRØ-63(12)5
4½ ft rock chip channel sample. The sample is a stockwork of strong qtz veining in lithic tuff. Vuggy & druzzie qtz is found in veins. FeOx on fracts & joints (med. hem) ~~Well~~ Poorly fractured rk.

Tues

9/18) Bill Mitchell Sept 18, 1984

Skeletonizing core & putting into sample bags. - 2 ft samples

Hole #1

	sample depth	length of sample	Beg. of Run	description
84001 PG	10-12'	23"	10'	solid most of core present
2	12-14'	23"		"
3	14-16'	23"		"
84004 PG	16-18'	24"	16'	Solid
5	18-20'	24"		solid
6	20-22'	19½"		17" solid balance broken
7	22-24'	13"		11" solid balance broken
8	24-26'	24"		solid

△○△○△○△○△○△○△○△○△○△○

9/19) Bill Mitchell (wed) Sept 19, 1984

84009PG	26-28'	24"	26'	Solid
10	28-30'	24"		Broken w/some clay in fracts
11	30-32'	24"		Solid but Broken.
12	32-34'	24"		Solid
13	34-36'	24"		Solid
84014 PG	36-38'	24"	36'	Solid
15	38-40'	24"		Solid
84016PG	40-42'	24"		Mostly solid 4" fract. portion
84017PG	42-44'	24"		Mostly Solid 3" fract portion
18	44-46'	24"		Solid
84019PG	46-48'	24"	46'	"
20	48-50'	24"		"
21	50-52'	24"		"
22	52-54'	24"		"
23	54-56'	24"		"
84024PG	56-58'	24"	56'	"
25	58-60'	24"		"
26	60-62'	24"		"
27	62-64'	24"		Mostly Solid 1st ½ is broken slightly
28	64-66'	24"		Solid
29	66-68'	24"	66'	"
30	68-70'	24"		"
31	70-72'	24"		"
32	72-74'	24"		"
33	74-76'	24"		"
34	76-78'		76	
35	78-80'			
36	80-82'			
37	82-84'			
38	84-86'			
39	86-88'			
40	88-90'			
41	90-92'			
42	92-94'			
84043PG	94-96			

84044PG	96-98'				
45	98-100'				
46	100-102'				
47	102-104'				
48	104-106'				
49	106-108'		106		
50	108-110'	24"		Solid	
* 51	110-112'	24"		" Mostly Solid 6" broken portion	
52	112-114'	24"			
53	114-116'	24"		Mod. broken	
54	116-118'	24"	116	End is very fract. skeleton @ 20"	
55	118-120'	24"		Solid	
56	120-122'	24"		4-6" broken	
57	122-124'	24"		Solid	
58	124-126'	24"		Solid	
59	126-128'	21"	126	very fract 1/3 brkn	
* 60	128-130'	20		gravel	Lab 9/24
* 61	130-132'	15"		gravel	
* 62	132-134'	17		broken 2/3 gravel	
* 63	134-136'	24"		Slid	
64	136-138'	24"	136'	Solid	
65	138-140'	24"		"	
66	140-142'	24"		"	
67	142-144'	24"		"	
68	144-146'	24"		"	
69	146-148'	24	146'	Solid but brkn.	
84070PG	148-150'	23"		Brkn	

84071PG	150-152'	19"		End very brkn	
72	152-154'	23"		Broken	
73	154-156'	24"		Solid but brkn.	
74	156-158'	18"	156'	Beginning 1/3 brkn	
75	158-160'	24"		mstly solid	
76	160-162'	24"		Solid	
77	162-164'	24"		Solid	
78	164-166'	24"		Solid	
79	166-168'	24"		"	
80	168-170'	24"		"	
81	170-172'	24"		"	
82	172-174'	24"		"	
83	174-176'	24"		"	
84	176-178'	24"	176'	"	
85	178-180'	24"		"	
86	180-182'	24"		"	
87	182-182.7'	8.5"		The balance of 24" is fresh dike;	
88	182.7-186				
89	186-188'				
90	188-190'				
91	190-192'				
92	192-194'				
93	194-196'				
94	196-198'				
95	198-200'				
84096PG	200-202'				

← A — VE →

			x	x	x —	
8	84 097PG	202-204'				Solid. 4" total like rkw/soil
9/25	98	204-206'	24"			
	99	206-208'	24"	206		Solid
	100	208-210'	24"			"
	101	210-212'	24"			"
	102	212-214'	24"			Solid but very brkn
	103	214-216'	24"			Solid
	104	216-218'	23"	216		"
	105	218-220'	23"			"
	106	220-222'	23"			"
	107	222-224'	23"			"
	108	224-226'	23"			"
	109	226-228'	24"	226		Solid
	110	228-230'	24"			"
	111	230-232'	24"			"
	112	232-234'	24"			"
	113	234-236'	24"			"
	114	236-238'	24"	236		"
	115	238-240'	24"			"
Lab 9/25	116	240-242'	24"			"
	117	242-244'	24"			"
	118	244-246'	24"			"
	119	246-248'	24"	246		"
	120	248-250'	24"			"
	121	250-252'	24"			"
	122	252-254'	24"			"
	84123PG	254-256'	24"			"

			x	x	x —	
	84124PG	256-258'	24"	256		Solid
	125	258-260'	24"			"
	126	260-262'	24"			"
	127	262-264'	24"			"
	128	264-266'	24"			"
	129	266-268'	22"	266		Solid but brkn.
	130	268-270'	21"			"
	131	270-272	21"			"
	132	272-274'		277		
	133	274-276'				
	134	276-278'				
	135	278-280'				
	136	280-282'				
	137	282-284'				
	138	284-286'				
	139	286-288'				
	140	288-290'				
	141	290-292'				
	142	292-294'				
	143	294-296'	24"			
	144	296-298'		296		Solid
	145	298-300'				
	146	300-302'				
	147	302-304'	24"			Solid
	148	304-306'	24"			"
	149	306-308'	24"	306		"
	84150PG	308-310'				

		×	×	× –
84151 PG	310-312'	23"		Top 6" broken
152	312-314'			
153 [redacted]	314-316'	24"		Solid
154 [redacted]	316-318'	24"	316	Solid. Some broken
155	318-320'			
156	320-322'			
157	322-324'			
158	324-326'			
159 [redacted] 9/26	326-328'	24"	326"	Solid
160	328-330'			
161	330-332'			
162	332-334'			
84163 PG	334-335'			
	335			

1

Hole #2

		×	×	× –
Number				
84164 PG	10-12'			
165	12-14'			
166	14-16'			
167	16-18'			
168	18-20'			
169	20-22'			
170	22-24'			
171	24-26'			
172	26-28'			
173	28-30'			
174	30-32'			
175	32-34'			
176	34-36'			
177	36-38'		36'	
178	38-40'	23"		Solid but broken
179 [redacted] 179	40-42'			
180 [redacted]	42-44'	19"		Solid but broken
181 [redacted]	44-46'	21"		"
182	46-48'	24	46'	"
183	48-50'	22		"
184	50-52'	21		"
185	52-54'	20		"
186	54-56'	21		"
84187 [redacted] PG 187	56-58	23"	58	Solid

2

84188 PG		58-60'	24"	x	x Solid
189	189	60-62'	24"		Solid
190		62-64'	22"		Solid but broken
191		64-66'	23"		"
192		66-68'	22"		"
193		68-70'	22"		"
194		70-72'			
195		72-74'			
196		74-76'			
197		76-78'			
198		78-80'			
199		80-82'			
200		82-84'			
201		84-86'			
202		86-88'			
203		88-90'			
204		90-92'			
205		92-94'			
206		94-96'			
207		96-98'			
208		98-100'			
209		100-102'			
210		102-104'			
211		104-106'			
212		106-108'			
84213 PG		108-110'			

84214 PG		110-112'		✓	x	x –			
215		112-114'							
216		114-116'							
217		116-118'		24"	116		Solid		
218		118-120'							
219		120-122'							
220		122-124'							
221		124-126'							
222		126-128'		24"			Solid broken		
223		128-130'		23"					
224		130-132'		20"			"		
225		132-134'		24"			"		
226		134-136'		24"			Mud gravel but solid		
227		136-138'		24"			"		
228		138-140'		24"			½ " solid		2
229		140-142'		24"			solid		
230		142-144'		24"			"		
231		144-146'		24"			"		
232		146-148'		24"			"		
233		148-150'		24"			"		
234		150-152'		24"			"		
235		152-154'		24"			"		
236		154-156'		24"			"		
237		156-158'		24"			"		
238		158-160'							
84239 PG		160-162'							

		x	x	x –
84240PG	162-164'	24"		Solid
241	164-166'	24"		Solid
242	166-168'			
243	168-170'			
244	170-172'			
245	172-174'			
246	174-176'	24"		Solid
247	176-178'	24"		Solid
248	178-180'			
249	180-182'	24"		Solid
250	182-184	24"		Solid
251	184-186	24"		"
252	186-188	24"		"
253	188-190	24"		Solid but broken
254	190-192	"		
255	192-194	"		"
256	194-196	"		
257	196-198	"	196	
258	198-200	"		
259	200-202	"		
260	202-204	"		
261	204-206	"	204	
262	206-208	"		
263	208-210	"		
264	210-212	"		
84265PG	212-214	24"		Solid but broken

		x	x	x –
84266PG	214-216'	24" -	214	Solid but broken
267	216-218'	24"	216	"
268	218-220'			Solid but broken
269	220-222'	23"		"
270	222-224'	24"		"
271	224-226'	24"		Solid.
272	226-228'	24	226	"
273	228-230'	24		"
274	230-232'			
275	232-234'	24"		Solid
276	234-236'	24"		"
277	236-238'	24"		"
278	238-240'	24"		"
279	240-242'	24"		
280	242-244'	23"		
281	244-246'		246	
282	246-248'			
283	248-250'			
284	250-252'			
285	252-254'			
286	254-256'			
287	256-258'			
288	258-260'			
289	260-262'			
290	262-264'			
84291 PG	264-266'			

			x	x	x –	
84 292 PG		266-268'				
293		268-270'				done
294		270-272'				"
295		272-274'				"
296		274-276'				"
297		276-278'				
298		278-280'				
299		280-282'				"
LAO 10-8	300	282-284'				"
301		284-286'				
302		286-288'				
303		288-290'				
304		290-292'				"
305		292-294'				"
2 306		294-296'				
307		296-298'				
308		298-300'				
309		300-302'				
310		302-304'				
311		304-306'				
312		306-308'				
313		308-310'				
314		310-312'				
315		312-314'				
316		314-316'				
84 317 PG		316-318'				"

			x	x	x –							
84 318 PG		318-320'										
319		320-322'										
320		322-324'										
321		324-326'										
322		326-328'										
323		328-330'								done		
324		330-332'										
325		332-334'										
326		334-336'										
327		336-338'										
328		338-340'										
329		340-342'										
330		342-344'										
331		344-346'										
332		346-348'										2
333		348-350'										
334		350-352'										
335		352-354'										
336		354-356'										
337		356-358'										
338		358-360'										
339		360-362'										
340		362-364'										
341		364-366'										
342		366-368'										
84 343 PG		368-370'										

			x	x	x —
84 344PG	370-372'				
345	372-374'				
346	374-376'				
347	376-378'				
84 348PG	378-380'				

samples from the [illegible] to [illegible] these [illegible] marked [illegible] ink.

HOLE # 3

						x	x	x —		
84349PG					10-12'	21"	10'	Solid but broken		
350					12-14'	23"		"		
351					14-16'	21"		" but gets into gravel		
352					16-18'	24"	16'	clay, rks, all gravel		
353					18-20'	24"		clay broken		
354					20-22'	24"		"		
355					22-24'	24"		"		
356					24-26'	24"		gravel & clay		
357					26-28'	14"	26	broken gravel & clay		
358					28-30'	14"		"		
359					30-32'	21"	31	Solid but broken		
360					32-34'	24"	33	Solid but broken		
361					34-36'	24"		Solid but broken		
362					36-38'	24"	36	Solid but broken		
363					38-40'	24"		"		
364					40-42'	24"		"		
365					42-44'	18"	42	"		
366					44-46'	19"		"		
367					46-48'	24"	46	"		
368					48-50'	24"		"		
369					50-52'	24"		"		
370					52-54'	24"		"		
371					54-56'	24	54	"		
372					56-58'	24		"		
373					58-60'	20		"		
374					60-62'	16		"		
84375PG					62-64'	21	63	"		

		x	x	x —
84376PG	64-66'	9"		broken
377	66-68'	29"	66'	"
378	68-70'	10"		"
379	70-72'	10"		"
380	72-74'	12"		"
381	74-76'	9"		"
382	76-78'	20"	76'	"
383	78-80'	19"		"
384	80-82'	16"	81'	"
385	82-84'	22"		"
386	84-86'	23	84'	"
387	86-88'	24"		solid
388	88-90'	20"		solid but broken
389	90-92'	22"		"
390	92-94'	21"		"
391	94-96'	18"		"
392	96-98'	24"	96	"
393	98-100'	24"		"
394	100-102'	24"		"
395	102-104'	24"	103	"
396	104-106'	24"		"
397	106-108'	24"		solid but broke
398	108-110'	24"		solid but broke
399	110-112'	20		broken
400	112-114'	24"	112	solid but broken
401	114-116'	24		"
84402PG	116-118	20"		solid

		x	x	x —
84403PG	118-120	19		broken & fract
404	120-122	16"	120	solid but broken
405	122-124	17"	122	"
406	124-126	21"		broken
407	126-128	15"		"
408	128-130	17"		"
409	130-132	17		
410	132-134	14"	133	
411	134-136	15"		
412	136-138	12"		broken
413	138-140	7"		gravel
414	140-142	4"		gravel
415	142-144	13"	142	gravel solid
416	144-146	21"		solid but broken
417	146-148	24"		"
418	148-150	24"		"
419	150-152			
420	152-154			
421	154-156	21"		
422	156-158	21"		
423	158-160	21"		
424	160-162	18"		
425	162-164			
426	164-166			
427	166-168	14"		broken
428	168-170	14		"
84429PG	170-172			

		x	x	x —
84430PG	172-174'			
431	174-176'	24"		Solid
432	176-178'			
433	178-180'			
434	180-182'			
435	182-184'			
436	184-186'			
437	186-188'			
438	188-190'			
439	190-192'			
440	192-194'			
441	194-196'			
442	196-198'			
443	198-200'			
444	200-202'			
445	202-204'			
446	204-206'			
447	206-208'			
448	208-210'			
449	210-212'			
450	212-214'			
451	214-216'			
452	216-218'			
453	218-220'			
454	220-222'			
455	222-224'			
456	224-225			

Hole #4

		x	x	x —	
84457PG	21-22'	7"	21		Very punky ext. well fract. crumbly.
458	22-24'	12"			"
459	24-26'	17"			Synalar to above but tighter
460	26-28'	19"	27		"
461	28-30'	23"			Broken crumble
462	30-32'	18"			Broken crumbly
463	32-34'	20"			"
464	34-36'	20"	35		"
465	36-38'	19"			Broken & crumbly some rounded rks
466	38-40'	24"	39		Solid
467	40-42'	24"			"
468	42-44'	24"			"
469	44-46'	24"			"
470	46-48'	24"			"
471	48-50'	24"	49		"
472	50-52'	19"			"
473	52-54'	20"			"
474	54-56'	23"			"
475	56-58'	24	56		"
476	58-60'	24			"
477	60-62'	24			"
478	62-64'	24			"
479	64-66'	24			"
480	66-68'	24	66		"
481	68-70'	24			"
84482PG	70-72'				

84483PG		72-74'	24"		Solid
484		74-76'	24"		Solid
485		76-78'	24"	76'	Solid
486		78-80'	24"		Solid
487		80-82'	24"		Solid
488		82-84'	24"	83'	½ Solid ½ broken
489		84-86'	24"	85'	Solid w/ fracts. Partly broken
490		86-88'	24"		Solid but some cupped surfaces
491		88-90'	24"		Solid w/ cupped ground surfaces
492	NO SKELETON	90-92'	5"		very brkn frags of core
493	" "	92-94'	3"		" "
494	" "	94-96'	6"	95'	" ½ gravel
495	" "	96-98'	7"		gravel
496	" "	98-100'	8"		gravel
497		100-102'	4½"	102'	Different PR type Ground on both sides
498		102-104'	22"		Mostly Solid
499		104-106'	24"		Solid
500		106-108'	24"	106'	Solid
501		108-110'	12½"		Solid but broken
502		110-112'	15"		broken frags
503		112-114'	17"		broken frags.
504		114-116'	16"	115'	Partly(½) broken
505		116-118'	24"		Solid
506		118-120'	24"		Solid
507		120-122'	24"		Solid
508		122-124'	24"	122'	"
84509PG		124-126'	20"		

57"

25"

84510PG		126-128'	24	126'	Solid
511		128-130'	24		Solid
512		130-132'	24"		Solid
513		132-134'	24"	132'	Solid but Brkn
514		134-136'	24"		Solid
515		136-138'	24"		Solid
516		138-140'	24"		Solid
517		140-142'	24"		Solid
518		142-144"	24"		"
519		144-146'	24"		"
520		146-148'	24"	146'	"
521		148-150'	24"		"
522		150-152'	24"		"
523		152-154'			"
524		154-156'			"
525		156-158'			"
526		158-160'	23"		Mostly Solid
527		160-162'	11"		Ptly Brkn
528		162-164'	10"		Brkn ½ Gravel w/ clay
529		164-166'	0"		Solid Silicified
530		166-168'	24"		Solid
531		168-170'	24"		"
532		170-172'	24"		"
533		172-174'	24"		"
534		174-176'	24"		"
535		176-178'	24"	176'	"
84536PG		178-180'			

10-1

10-2

10-4

TO LAB

84537PG	180-182'	24"			Solid
538	182-184'	24"			"
539	184-186'	24"	185		"
540	186-188'	24"			"
541	188-190'	24"			"
542	190-192'	24"			"
543	192-194'	24"			"
544	194-196'	24"	195		"
545	196-198'	24"			"
546	198-200'	24"			"
547	200-202'	24"			"
548	202-204'	24"			"
549	204-206'	24"	205		"
550	206-208'				done
551	208-210'				"
552	210-212'				"
553	212-214'				"
554	214-216'				
555	216-218				
556	218-220'				"
557	220-222'				"
558	222-224'				
559	224-226'				"
560	226-228'				
561	228-230'				"
562	230-232'				
84563PG	232-234'				

10-4 Lab 10-4

10-5

To Lab 10-5

84564PG			234-236'										
565			236-238'										
566			238-240'										
567			240-242'										
568			242-244'										
569			244-246'										
570			246-248'										
571			248-250'										
572			250-252'										
573			252-254'										
574			254-256'										
575			256-258'										
576			258-260'										
577			260-262'										
578			262-264'										
579			264-266'										
580			266-268'										
581			268-270'										
84582PG			270-272'										

HOLE #5

		x	x	x —
84 583 PG	11-12'			
584	12-14'			
585	14-16'			
586	16-18			
587	18-20'			
588	20-22'			
589	22-24'		22.5	
590	24-26'			
591	26-28'			
10/16 592	28-30'	24"		solid but fract
593	30-32	24"		"
594	32-34'	19"	32.5	broken but solid
595	34-36'	21"		6" of gravel
596	36-38	18"	36	broken, solid, rounded ends
597	38-40'	14"		"
598	40-42'	22	41	broken but solid
599	42-44'	23"		broken
600	44-46'	21"		solid but fract.
601	46-48'	18		very broken
602	48-50'	21"	48	broken
603	50-52'	20"		broken but solid
604	52-54'	21"		"
605	54-56'	21"		"
606	56-58'	22"		very broken 10"
607	58-60'	22		solid but broken
84 608 PG	60-62'	23	60	Solid

5

		x	x	x —
84 609 PG	62-64'	23		Solid but broken
610	64-66'	22		"
611	66-68'	22		"
612	68-70'	23		"
613	70-72'	23		
614	72-74'	23		
615	74-76'	24		
616	76-78'	23		
617	78-80'	24"	78'	Solid but broken
618	80-82'	24"		"
619	82-84'	24"		"
620	84-86'	24"		"
621	86-88'	24"	86'	"
622	88-90'	24"		"
623	90-92'	24"		"
624	92-94'	24"		"
625	94-96'	24"		"
626	96-98	21"	96'	"
627	98-100'	23"		"
628	100-102'	23"		"
629	102-104'	21"		"
630	104-106'	21"		"
631	106-108'	23"	106	"
632	108-110'	21"		"
633	110-112'	21"		"
634	112-114'	21"		"
84 635 PG	114-116'	22"		

5

84636 PG	116-118'	24"	116	*Solid but broken
637	118-120'	24"		"
638	120-122'	24"		"
639	122-124'	24"		"
640	124-126'	24"		" to crumb 24
641	126-128'	24	126	Solid but fract.
642	128-130'	24		"
643	130-132'	22		"
644	132-134'	24"		"
645	134-136'	24"		"
646	136-138'	24"		"
647	138-140'	24"		"
648	140-142'	24"		"
649	142-144'			
650	144-146'			
651	146-148'			
652	148-150'			
653	150-152'	24"		solid but fract.
654	152-154'	23"		"
655	154-156'	24"		"
656	156-158'	23"		"
657	158-160'	23"		"
658	160-162'	23"		"
659	162-164'			
660	164-166'			
661	166-168'			
662	168-170'			
84663 PG	170-172			

5

10/6

84664 PG	172-174'				
665	174-176'	24'			solid
666	176-178'	24"	176'		solid but broken
667	178-180'	24"			"
668	180-182'	23"	180		"
669	182-184'	24"			"
670	184-186'	17			vry broken
671	186-188'	19"	186		"
672	188-190'	20"			"
673	190-192'	16"			"
674	192-194'	17"			"
675	194-196'	16"	175		"
676	196-198'	16"			"
677	198-200'	15"			"
678	200-202'		2		
679	202-204'		202		
680	204-206'				
681	206-208'				
682	208-210'				
683	210-212'				
684	212-214'				
685	214-216'				
686	216-218'				
687	218-220'				
688	220-222'				
689	222-224'				
84690 PG	224-226'	24"			

5

84691 PG	226-228'		x	x	x —
692	228-230'				
693	230-232'				
694	232-234'				
695	234-236'				
696	236-238'				
697	238-240'				
698	240-242'				
699	242-244'				
700	244-246'				
701	246-248'				
702	248-250'				
703	250-252'				
704	252-254'				
705	254-256'				
706	256-258'				
707	258-260'				
708	260-262'				
709	362-264				
84710 PG	264-266				

HOLE #6

84711 PG			13-14'										
712			14-16'										
713			16-18'										
714			18-20'										
715			20-22'										
716			22-24'										
717			24-26'			21"					Mostly solid, brkn.		
718			26-28'			24"		26.5			Solid but brkn		
719			28-30'			24"					"		
720			30-32'			24"					"		
721			32-34'			24"					"		
722			34-36'			24"		35.5			"		
723			36-38'			24"					"		
724			38-40'			24"					"		
725			40-42'			24"					"		
726			42-44'			24"					"		
727			44-46'			24"		45.5			"		
728			46-48'			24"					"		
729			48-50'			24"					"		
730			50-52'			24"					"		
731			52-54'			24"					"		
732			54-56'			24"					broken		
733			56-58'			24"					Solid but brkn		
734			58-60'			24"					"		
84735 PG			60-62'			23"					"		

		x	x	x –
84736PG	62-64'	23		Solid but broken
737	64-66'	24"	64	"
738	66-68'	24"	67	"
739	68-70'	20"		broken
740	70-72'	20"		"
741	72-74'	24"	73.5	Solid & v. broken
742	74-76'	24"		Solid but broken
743	76-78'	24"		mudy & broken
744	78-80'	21"		"
745	80-82'	22"		"
746	82-84'	21"		Solid but broken
747	84-86'	21"		"
748	86-88'	21"		"
749	88-90'	21"		"
750	90-92'	21"		"
751	92-94'			
752	94-96'			
753	96-98'			
754	98-100'			
755	100-102'			
756	102-104'	24		"
757	104-106'	22"	105.8	"
758	106-108'			
759	108-110'	21"		"
760	110-112'		11.5	
761	112-114'	23"		"
84762PG	114-116	20"		1/2 gravel

		x	x	x –
84763PG	116-118'	20"		very broken
764	118-120'	23"	118	Solid but broken
765	120-122'	24"		"
766	122-124'		123	
767	124-126'			
768	126-128'	24"	127	Solid but broken
769	128-130'	24		"
770	130-132	24		"
771	132-134'	22		"
772	134-136'	22		"
773	136-138'	21	136	"
774	138-140'	24"		"
775	140-142'	24"		"
776	142-144'	24	143	"
777	144-146'	24"		"
778	146-148'	24"		"
779	148-150'	24"		"
780	150-152'	24"		"
781	152-154'	24"	153	"
782	154-156'	21"		"
783	156-158'	22"		"
784	158-160'	18"		Gravel
785	160-162'	21"		gravel & solid
786	162-164'	22"	163	solid but broken
787	164-166'			
788	166-168'	22"		gravel
84789PG	168-170'			

			x	x	x —
84790-PG	170-172'				
791	172-174'	11		173	gravel
792	174-176'	11			11
793	176-178'	13"			Solid but broken & gravel
794	178-180'	10"			Solid but broken
795	180-182'	13			11
796	182-184'			183	
797	184-186'				
798	186-188'				
799	188-190'				
800	190-192'				
801	192-194'				
802	194-196'				
803	196-198'				
6 804	198-200'				
805	200-202'	12"		201	Solid but broken
806	202-204'				
807	204-206'				
808	206-208'				
809	208-210'				
810	210-212'				
811	212-214'				
84812 PG	214-215'				

10/2-3 to lab all of hole 6

Bill Mitchell

WED 10-3-84

Filmed Hole 1

Box														
	1	2			pict.		5	6						
	3	4						7						
	5	6						8						
	7	8						9						
	9	10						10						
	11	12						11						
	13	14						12						
	15	16						13						
	17	18						14						
	19	20						15						
	20	22						16 ?						
	23	24						19						
	25	26						21						
	27	28						22						
	29	30						24						
	31	32						25						
	33	34						26						
	35	36						27						
	37							28						

10/24 Bill Mitchell (WED) Oct 24, 1984

Paiute, Came out to get collar elevations & to chelk road conditions.

Road conditions fine, rough where Datson (w/slicks) chewed up in snow but got up in 2H with Toyota, with no trouble.

Drill pad elevations (set altimater at creek crossing)

DRILL PAD	HOLE #	elev. ft
A	1,2	
B	3,4,5,6	
C		

Bill Mitchell (FRI) Oct 26, 1984 10/26

Ran arround Reno doing chores.

Paiute - weather Storm clouds blasting Eastward cool & very windy.

Continuing traverse, Below the path. left off w/84311PR above trail.

84312PRØ - 31(12)5.

5ft rock chip, channel sample. The rk is mod. - strongly silicified tuff. Mod fractured. FeOx stain is predomanant on fract surfaces. Mod hem & geothite. some jarosite Qtz occurs as a stockwork vein w/cavities that often desplay druzzy qtz Xtls.

84313PRØ 31(12)5.

5ft rock chip channel sample, The rock is greenish grey Tuff, Mod-Strongly Silicified with Mod stockwork. qtz veins have druzzy qtz xtls, Wk to Mod FeOx on fract surfaces & in cavities.

(Mon)

10/29 Bill Mitchell Oct. 29, 1984

Mostly sunny, breezy, & cool

84314 PRØ-31(12)5

5 ft rock chip channel sample. The rock is gray wkly silicified tuff. Stockwork qtz veins constitute Mod. 10-25% of the rock. The outcrop is mod fractured w/extinsive joints. FeOx staining is mod (hem, geothite, & jarosite(?)) on fracts surfaces & qtz vngs.

84315 PRØ-63(12)5

5 ft rock chip channel sample. The rock is grayish-green wkly propylatized tuff; wkly - mod qtz veined. Qtz veins are often FeOx (hem) stained. Hem & limon on fracts & joint surfaces. Barite xtls in a qtz vein (drzzy) cavities.

84316 PRØ-63(12)5

5 ft rock chip channel sample. The rock is green propylitically altered tuff. Qtz veining ranges from wk.-strong. Strong on its N. end.

84317 PRØ-63(11)5

5 ft rock chip channel sample across green wkly propylatized tuff. Mod-wkly qtz veined. FeOx staining follows some veins, & predominates on fracts, & joints.

(TUE)

Bill Mitchell Oct 30, 1984

Partly cloudy & cool, breezey.

84318PRØ-63(11)5
5 ft channel sample rck chip. The rock is green propylitically altered tuff. Wkly qtz veined; wk-mod FeOx stained

84319PRØ-63(11)5
5 ft rock chip channel sample. The rock is a green propylitically altered lithic tuff. The rock is wkly qtz veined & mod FeOx stained. FeOx stain (hem, limon, & jaros(?)) along fracts & joints.

84320PRØ-63(11)5
5 ft rck chip channel sample. The sample is a green propylitically altered lithic tuff. Very fractured. Wkly qtz veined. Mod FeOx stain on fract surfaces. hem, limon, & jarosite.

84321PRØ-63(11)5
5 ft rck chip channel sample. The sample is green propylitically altered tuff. Wkly qtz veined. FeOx stain is mod on fractures, which are strong. Hem & limon & jarosite(?). Hem along qtz veins.

84322PRØ-63(11)5
5 ft rock chip channel sample through well fractured green propylitically altered tuff. The rock is wkly qtz veined & wkly FeOx stained w/ hem, limon & jaros(?).

84323PRØ-63(11)5
5 ft rck chip channel sample. The sample is green propylitically altered tuff. Wkly qtz veined. Wk-mod FeOx stain on fract surfaces. Mod along qtz veins.

[illegible] ow *?#.4*&

84324PRØ-63(11)5
5 ft rck chip channel sample. The rk is green propylitized tuff. In places wkly silicified. Qtz veining is wk-mod. FeOx stain is wk on fract. surfaces. (Hem, limon, & jaros.)

(WED)

Bill Mitchell Oct 31, 1984

Cold clear & breezy.

84325PRØ-63(11)5

5 ft rock chip channel sample. The rock is a green propylatized wkly argillized tuff. Trace qtz veins. "Stain" of FeOx. (strong along joint) Mod along fracts. Kemp limon.

84326PRØ-32(12)5

5 ft rock chip channel sample across a fault. (slickenside) grayish grn wkly propylatized tuff. Qtz veins are grainular to glassy & very fine grained massive qtz. Alot of cavities often FeOx stained. FeOx stain mod-strong on fracts joints & faults.

84327PRØ-32(11)5

5 ft rock chip channel sammple. The rock is gray wkly argillized. Wkly-mod qtz veined in narrow veins w/ frequent cavities. Same SiO_2 as previous sample. FeOx stain is strong along joints & mod along fracts.

William J. Mitchell

SAMPLE COMPUTER CODES

		Au	Ag			Au	Ag
B4001PRØ	-63(12)5			84046PRØ	-63(12)5		
2	-63(12)5			47	-63(11)5		
3	-63(11)5			48	-33(11)5		
4	-63(11)5			49	-31(11)5		
5	-63(12)5			50	-63(13)5		
6	-63(12)5			51	-31(13)5		
7	-63(12)5			52	-31(13)5		
8	-63(12)5			53	-32(11)5		
9	-			54	-		
10	-63(12)5			55	-31(13)5		
11	-			56	-		
12	-63(12)5			57	-31(03)5		
13	-			58	-34(12)5		
14	-63(12)5			59	-34(13)5		
15	-63(11)5			60	-32(11)5		
16	-63(11)5			61	-32(11)5		
17	-63(12)5			62	-32(11)5		
18	-63(12)5			63	-32(11)5		
19	-63(11)5			64	-32(11)5		
20	-63(12)5			65	-32(11)5		
21	-63(11)5			66	-GØ81		
22	-63(11)5			67	-32(11)5		
23	-63(12)5			68	-34(11)5		
24	-63(11)5			69	-34(11)5		
25	-63(12)5			70	-32(11)5		
26	-63(12)5			71	-32(11)5		
27	-63(11)5			72	-34(13)5		
28	-63(11)5			73	-32(11)5		
29	-63(12)5			74	-51(13)5		
30	-63(11)5			75	-51(13)5		
31	-63(11)5			76	-31(13)5		
32	-63(12)5			77	-31(12)5		
33	-63(12)5			78	-32(12)5		
34	-63(12)5			79	-32(11)5		
35	-61(12)5			80	-32 55		
36	-63(12)5			81	-32 55		
37	-61(12)5			82	-34(12)5		
38	-63(13)5			83	-31(11)5		
39	-63(12)5			84	-61(12)5		
40	-23(12)5			85	-31(11)5		
41	-61(13)5			86	-34(11)5		
42	-61(11)5			87	-31(12)5		
43	-63(12)5			88	-31(11)5		
44	-63(11)5			89	-31(11)5		
45	-63(13)5			90	-63(11)5		

		Au	Ag			Au	Ag
84091PRØ	33(11)5			84136PRØ	63(11)5		
92	33(12)5			137	33(11)5		
93	31(12)5			138	63(11)5		
94	32(11)5			139	63(11)5		
95	32(11)5			140	63(11)5		
96	32(11)5			141	63(11)5		
97	32(11)5			142	63(12)5		
98	63(11)5			143	63(12)5		
99	63(11)5			144	64(11)5		
100	33(11)5			145	64(11)5		
101	31(11)5			146	31(11)5		
102	31(11)5			147	31(11)5		
103	31(11)5			148			
104	31(13)5			149			
105	63(13)5			150			
106	31(11)5			151			
107	33(11)5			152			
108	31(11)5			153			
109	31(11)5			154			
110	31(11)5			155			
111	31(11)5			156			
112	31(12)5			157			
113	31(11)5			158			
114	31(12)5			159			
115	31(11)5			160			
116	31(11)5			161			
117	31(11)5			162			
118	31(13)5			163			
119	31(13)5			164			
120	31(13)5			165			
121	31(11)5			166			
122	31(11)5			167			
123	34(11)5			168			
124	31(12)5			169			
125	64(11)5			170			
126	34(11)5			171			
127	34(11)5			172			
128	63(12)5			173			
129	63(11)5			174			
130	34(11)5			175			
131	34(11)5			176			
132	34(11)5			177			
133	34(11)5			178			
134	63(11)5			179			
135	63(11)5			180			

						Au	Ag						Au	Ag
84181PRØ								84226PRØ						
182								227						
183								228						
184								229						
185								230						
186								231						
187								232						
188								233						
189								234						
190								235						
191								236						
192								237						
193								238						
194								239						
195								240						
196								241						
197								242						
198								243						
199								244						
200								245						
201								246						
202								247						
203								248						
204								249						
205								250						
206								251						
207								252						
208								253						
209								254						
210								255						
211								256						
212								257						
213								258						
214								259						
215								260						
216								261						
217								262						
218								263						
219								264						
220								265						
221								266						
222								267						
223								268						
224								269						
225								270						

		Au	Ag
84271PRØ-			
272			
273			
274			
275			
276			
277			
278			
279			
280			
281			
282			
283			
284			
285			
286			
287			
288			
289			
290			
291			
292			
293			
294			
295			
296			
297			
298			
299			
300		.001	.05
301			

164
.03
4.92

CURVE AND REDUCTION TABLES

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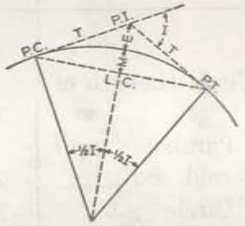


CURVE FORMULAS

1. Radius : $R = \dfrac{50}{\sin D/2}$
2. Degree of Curve: $D = 100\dfrac{I}{L}$. Also, $\sin D/2 = \dfrac{50}{R}$
3. Tangent : $T = R \tan \frac{1}{2} I$. Also, $T = \dfrac{T \text{ for } 1^\circ \text{ curve}}{D} + C$.
4. Length of Curve: $L = 100\dfrac{I}{D}$
5. Long Chord : $L.C. = 2R \sin \frac{1}{2} I$.
6. Middle Ordinate: $M = R\,(1 - \cos \frac{1}{2} I)$
7. External : $E = \dfrac{R}{\cos \frac{1}{2} I} - R$. Also, $E = T \tan \frac{1}{4} I$.

EXPLANATION AND USE OF TABLES

Given P.I. Sta. 83+40.7, $I = 45^\circ\ 20'$ and $D = 6^\circ 30'$ find:

Stations—P.C. = P.I. − T. $T = \dfrac{T \text{ for } 1^\circ \text{ Curve}}{D} + C$. From Tables V and VI $T = \dfrac{2392.8}{6.5} + .197 = 368.32 = 3+68.32$. Sta. P. C. = 83+40.7 − (3+68.32) = 79+72.38. P. T. = P. C. + L, and $L = 100\,\dfrac{I}{D} = 100\,\dfrac{45.33}{6.5} = 697.38$ Therefore, P. T. = (79+72.38) + (6+97.38) = 86+69.76.

Offsets—Tangent offsets vary (approximately) directly with D and with the square of the distance. From Table III Tangent Offset for 100 feet = 5.669 feet. Distance = 80 − Sta. P. C. = 27.62. Hence offset $= 5.66 \times \left(\dfrac{27.62}{100}\right)^2 = .432$ ft. Also, square of any distance, divided by twice the radius equals (approximately) the distance from tangent to curve. Thus $(27.62)^2 \div (2 \times 881.95) = .432$ ft.

Deflections—Deflection angle = ½ D for 100 ft., ¼ D for 50 ft., etc. For "X" ft., Deflection Angle (in minutes) = .3 × X × D. For Sta. 80 of above curve Deflection Angle = .3 × 27.62 × 6.5 = 53.86′. Also Deflection Angle = dfl. for 1 ft. from Table III × X = 1.95 × 27.62 = 53.86′. For Sta. 181 Deflection Angle $= 53.86' + \dfrac{6^\circ\ 30'}{2} = 4^\circ\ 8.86'$.

Externals—From Table V for 1° curve, with central angle of 45° 20′, E = 479.6. Therefore, for 6° 30′ curve, $E = \dfrac{479.6}{6.5}$ + Correction from Table VI = 7.378 + .039 = 7.417.

General Equations and Useful Data

	Symbol on Equation	Numerical Value
Area of circle	$\frac{\pi d^2}{4}$	
Area of Sector of Circle (Length of arc = l)	1/2 lr	
Area of Segment of Parabola (app.) (c = chord; m = mid. ord.)	2/3 cm	
Area of Segment of Circle	2/3 cm	
Cubic Feet in 1 Cubic Meter		35.3145
Cubic Inches in 1 Imperial Gallon		277.274
Cubic Inches in 1 U.S. Gallon		231
Feet in 1 Meter		3.2808
Feet in 1 Mile		5280
Gallons (Imperial) in 1 Cubic Foot		6.2321
Gallons (U.S.) in 1 Cubic Foot		7.48
Miles in 1 Kilometer		0.6213
Pounds (Av.) in 1 Kilogram		2.2046
Ratio of Circumference to Diameter	π	3.14159
Reciprocal of π		0.31831
Square Feet in 1 Acre		43,560
Volume of Sphere	$4/3\ \pi r^3$	

Table I.—Minutes in Decimals of a Degree.

1′	.0167	11′	.1833	21′	.3500	31′	.5167	41′	.6833	51′	.8500
2	.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
3	.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
4	.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
5	.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
6	.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
7	.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
8	.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
9	.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
10	.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

Table II.—Inches in Decimals of a Foot.

1/16	3/32	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	7/8
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729
1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

Table III.—Radii, Ordinates and Deflections

Deg.	Radius	Mid. Ord.	Tan Offset	Def. for 1 Foot	Deg.	Radius	Mid. Ord.	Tan Offset	Def. for 1 Foot
0° 10′	34377.5	.036	.145	0.05′	7°	819.02	1.528	6.105	2.10′
20	17188.8	.073	.291	0.10	20	781.84	1.600	6.395	2.20
30	11459.2	.109	.436	0.15	30	764.49	1.637	6.540	2.25
40	8594.42	.145	.582	0.20	40	747.89	1.673	6.685	2.30
50	6875.55	.182	.727	0.25	8	716.78	1.746	6.976	2.40
1	5729.65	.218	.873	0.30	20	688.16	1.819	7.266	2.50
10	4911.15	.255	1.018	0.35	30	674.69	1.855	7.411	2.55
20	4297.28	.291	1.164	0.40	40	661.74	1.892	7.556	2.60
30	3819.83	.327	1.309	0.45	9	637.28	1.965	7.846	2.70
40	3437.87	.364	1.454	0.50	20	614.56	2.037	8.136	2.80
50	3125.36	.400	1.600	0.55	30	603.80	2.074	8.281	2.85
2	2864.93	.436	1.745	0.60	40	593.42	2.110	8.426	2.90
10	2644.58	.473	1.891	0.65	10	573.69	2.183	8.716	3.00
20	2455.70	.509	2.036	0.70	30	546.44	2.292	9.150	3.15
30	2292.01	.545	2.181	0.75	11	521.67	2.402	9.585	3.30
40	2148.79	.582	2.327	0.80	30	499.06	2.511	10.02	3.45
50	2022.41	.618	2.472	0.85	12	478.34	2.620	10.45	3.60
3	1910.08	.655	2.618	0.90	30	459.28	2.730	10.89	3.75
10	1809.57	.691	2.763	0.95	13	441.68	2.839	11.32	3.90
20	1719.12	.727	2.908	1.00	30	425.40	2.949	11.75	4.05
30	1637.28	.764	3.054	1.05	14	410.28	3.058	12.18	4.20
40	1562.88	.800	3.199	1.10	30	396.20	3.168	12.62	4.35
50	1494.95	.836	3.345	1.15	15	383.07	3.277	13.05	4.50
4	1432.69	.873	3.490	1.20	30	370.78	3.387	13.49	4.65
10	1375.40	.909	3.635	1.25	16	359.27	3.496	13.92	4.80
20	1322.53	.945	3.718	1.30	30	348.45	3.606	14.35	4.95
30	1273.57	.982	3.926	1.35	17	338.27	3.716	14.78	5.10
40	1228.11	1.018	4.071	1.40	18	319.62	3.935	15.64	5.40
50	1185.78	1.055	4.217	1.45	19	302.94	4.155	16.51	5.70
5	1146.28	1.091	4.362	1.50	20	287.94	4.374	17.37	6.00
10	1109.33	1.127	4.507	1.55	21	274.37	4.594	18.22	6.30
20	1074.68	1.164	4.653	1.60	22	262.04	4.814	19.08	6.60
30	1042.14	1.200	4.798	1.65	23	250.79	5.035	19.94	6.90
40	1011.51	1.237	4.943	1.70	24	240.49	5.255	20.79	7.20
50	982.64	1.273	5.088	1.75	25	231.01	5.476	21.64	7.50
6	955.37	1.309	5.234	1.80	26	222.27	5.697	22.50	7.80
10	929.57	1.346	5.379	1.85	27	214.18	5.918	23.35	8.10
20	905.13	1.382	5.524	1.90	28	206.68	6.139	24.19	8.40
30	881.95	1.418	5.669	1.95	29	199.70	6.360	25.04	8.70
40	859.92	1.455	5.814	2.00	30	193.18	6.583	25.88	9.00

NOTE. Chord Deflection = 2 times tangent deflection.

Table IV.—Deflections for Sub Chords for Short Radius Curves

Degree of Curve	Radius	Deflection Angles for Sub Chords of Various Lengths				Length of Arc for 100 Ft. Chord
		12.5 Ft.	15 Ft.	20 Ft.	25 Ft.	
30°	193.18	1° 51′	2° 17′	2° 58′	3° 43′	101.15
32°	181.39	1° 59′	2° 25′	3° 10′	3° 58′	101.33
34°	171.01	2° 06′	2° 33′	3° 21′	4° 12′	101.48
36°	161.80	2° 13′	2° 41′	3° 33′	4° 26′	101.66
38°	153.58	2° 20′	2° 49′	3° 44′	4° 40′	101.85
40°	146.19	2° 27′	2° 57′	3° 55′	4° 54′	102.06
42°	139.52	2° 34′	3° 05′	4° 07′	5° 08′	102.29
44°	133.47	2° 41′	3° 13′	4° 18′	5° 22′	102.53
46°	127.97	2° 48′	3° 21′	4° 29′	5° 36′	102.76
48°	122.92	2° 55′	3° 29′	4° 40′	5° 50′	103.00
50°	118.31	3° 02′	3° 38′	4° 51′	6° 04′	103.24
52°	114.06	3° 09′	3° 46′	5° 02′	6° 17′	103.54
54°	110.11	3° 16′	3° 54′	5° 13′	6° 31′	103.84
56°	106.50	3° 22′	4° 02′	5° 23′	6° 44′	104.14
58°	103.14	3° 29′	4° 10′	5° 34′	6° 57′	104.43
60°	100.00	3° 35′	4° 18′	5° 44′	7° 11′	104.72

Table V.—Tangents and Externals to a 1° Curve.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
1°	50.00	.22	11°	551.70	26.50	21°	1061.9	97.57
10′	58.34	.30	10	560.11	27.31	10′	1070.6	99.16
20	66.67	.39	20	568.53	28.14	20	1079.2	100.75
30	75.01	.49	30	576.95	28.97	30	1087.8	102.35
40	83.34	.61	40	585.36	29.82	40	1096.4	103.97
50	91.68	.73	50	593.79	30.68	50	1105.1	105.60
2	100.01	.87	12	602.21	31.56	22	1113.7	107.24
10	108.35	1.02	10	610.64	32.45	10	1122.4	108.90
20	116.68	1.19	20	619.07	33.35	20	1131.0	110.57
30	125.02	1.36	30	627.50	34.26	30	1139.7	112.25
40	133.36	1.55	40	635.93	35.18	40	1148.4	113.95
50	141.70	1.75	50	644.37	36.12	50	1157.0	115.66
3	150.04	1.96	13	652.81	37.07	23	1165.7	117.38
10	158.38	2.19	10	661.25	38.03	10	1174.4	119.12
20	166.72	2.43	20	669.70	39.01	20	1183.1	120.87
30	175.06	2.67	30	678.15	39.99	30	1191.8	122.63
40	183.40	2.93	40	686.60	40.99	40	1200.5	124.41
50	191.74	3.21	50	695.06	42.00	50	1209.2	126.20
4	200.08	3.49	14	703.51	43.03	24	1217.9	128.00
10	208.43	3.79	10	711.97	44.07	10	1226.6	129.82
20	216.77	4.10	20	720.44	45.12	20	1235.3	131.65
30	225.12	4.42	30	728.90	46.18	30	1244.0	133.50
40	233.47	4.76	40	737.37	47.25	40	1252.8	135.35
50	241.81	5.10	50	745.85	48.34	50	1261.5	137.23
5	250.16	5.46	15	754.32	49.44	25	1270.2	139.11
10	258.51	5.83	10	762.80	50.55	10	1279.0	141.01
20	266.86	6.21	20	771.29	51.68	20	1287.7	142.93
30	275.21	6.61	30	779.77	52.89	30	1296.5	144.85
40	283.57	7.01	40	788.26	53.97	40	1305.3	146.79
50	291.92	7.43	50	796.75	55.13	50	1314.0	148.75
6	300.28	7.86	16	805.25	56.31	26	1322.8	150.71
10	308.64	8.31	10	813.75	57.50	10	1331.6	152.69
20	316.99	8.76	20	822.25	58.70	20	1340.4	154.69
30	325.35	9.23	30	830.76	59.91	30	1349.2	156.70
40	333.71	9.71	40	839.27	61.14	40	1358.0	158.72
50	342.08	10.20	50	847.78	62.38	50	1366.8	160.76
7	350.44	10.71	17	856.30	63.63	27	1375.6	162.81
10	358.81	11.22	10	864.82	64.90	10	1384.4	164.86
20	367.17	11.75	20	873.35	66.18	20	1393.2	166.95
30	375.54	12.29	30	881.88	67.47	30	1402.0	169.04
40	383.91	12.85	40	890.41	68.77	40	1410.9	171.15
50	392.28	13.41	50	898.95	70.09	50	1419.7	173.27
8	400.66	13.99	18	907.49	71.42	28	1428.6	175.41
10	409.03	14.58	10	916.03	72.76	10	1437.4	177.55
20	417.41	15.18	20	924.58	74.12	20	1446.3	179.72
30	425.79	15.80	30	933.13	75.49	30	1455.1	181.89
40	434.17	16.43	40	941.69	76.86	40	1464.0	184.08
50	442.55	17.07	50	950.25	78.26	50	1472.9	186.29
9	450.93	17.72	19	958.81	79.67	29	1481.8	188.51
10	459.32	18.38	10	967.38	81.09	10	1490.7	190.74
20	467.71	19.06	20	975.96	82.53	20	1499.6	192.99
30	476.10	19.75	30	984.53	83.97	30	1508.5	195.25
40	484.49	20.45	40	993.12	85.43	40	1517.4	197.53
50	492.88	21.16	50	1001.7	86.90	50	1526.3	199.82
10	501.28	21.89	20	1010.3	88.39	30	1535.3	202.12
10	509.68	22.62	10	1018.9	89.89	10	1544.2	204.44
20	518.08	23.38	20	1027.5	91.40	20	1553.1	206.77
30	526.48	24.14	30	1036.1	92.92	30	1562.1	209.12
40	534.89	24.91	40	1044.7	94.46	40	1571.0	211.48
50	543.29	25.70	50	1053.3	96.01	50	1580.0	213.86

Table V.—Tangents and Externals to a 1° Curve.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
31°	1589.0	216.3	41°	2142.2	387.4	51°	2732.9	618.4
10′	1598.0	218.7	10	2151.7	390.7	10	2743.1	622.8
20	1606.9	221.1	20	2161.2	394.1	20	2753.4	627.2
30	1615.9	223.5	30	2170.8	397.4	30	2763.7	631.7
40	1624.9	226.0	40	2180.3	400.8	40	2773.9	636.2
50	1633.9	228.4	50	2189.9	404.2	50	2784.2	640.7
32	1643.0	230.9	42	2199.4	407.6	52	2794.5	645.2
10	1652.0	233.4	10	2209.0	411.1	10	2804.9	649.7
20	1661.0	235.9	20	2218.6	414.5	20	2815.2	654.3
30	1670.0	238.4	30	2228.1	418.0	30	2825.6	658.8
40	1679.1	241.0	40	2237.7	421.4	40	2835.9	663.4
50	1688.1	243.5	50	2247.3	425.0	50	2846.3	668.0
33	1697.2	246.1	43	2257.0	428.5	53	2856.7	672.7
10	1706.3	248.7	10	2266.6	432.0	10	2867.1	677.3
20	1715.3	251.3	20	2276.2	435.6	20	2877.5	682.0
30	1724.4	253.9	30	2285.9	439.2	30	2888.0	686.7
40	1733.5	256.5	40	2295.6	442.8	40	2898.4	691.4
50	1742.6	259.1	50	2305.2	446.4	50	2908.9	696.1
34	1751.7	261.8	44	2314.9	450.0	54	2919.4	700.9
10	1760.8	264.5	10	2324.6	453.6	10	2929.9	705.7
20	1770.0	267.2	20	2334.3	457.3	20	2940.4	710.5
30	1779.1	269.9	30	2344.1	461.0	30	2951.0	715.3
40	1788.2	272.6	40	2353.8	464.6	40	2961.5	720.1
50	1797.4	275.3	50	2363.5	468.4	50	2972.1	725.0
35	1806.6	278.1	45	2373.3	472.1	55	2982.7	729.9
10	1815.7	280.8	10	2383.1	475.8	10	2993.3	734.8
20	1824.9	283.6	20	2392.8	479.6	20	3003.9	739.7
30	1834.1	286.4	30	2402.6	483.8	30	3014.5	744.6
40	1843.3	289.2	40	2412.4	487.2	40	3025.2	749.6
50	1852.5	292.0	50	2422.3	491.0	50	3035.8	754.6
36	1861.7	294.9	46	2432.1	494.8	56	3046.5	759.6
10	1870.9	297.7	10	2441.9	498.7	10	3057.2	764.6
20	1880.1	300.6	20	2451.8	502.5	20	3067.9	769.7
30	1889.4	303.5	30	2461.7	506.4	30	3078.7	774.7
40	1898.6	306.4	40	2471.5	510.3	40	3089.4	779.8
50	1907.9	309.3	50	2481.4	514.3	50	3100.2	784.9
37	1917.1	312.2	47	2491.3	518.2	57	3110.9	790.1
10	1926.4	315.2	10	2501.2	522.2	10	3121.7	795.2
20	1935.7	318.1	20	2511.2	526.1	20	3132.6	800.4
30	1945.0	321.1	30	2521.1	530.1	30	3143.4	805.6
40	1954.3	324.1	40	2531.1	534.2	40	3154.2	810.9
50	1963.6	327.1	50	2541.0	538.2	50	3165.1	816.1
38	1972.9	330.2	48	2551.0	542.2	58	3176.0	821.4
10	1982.2	333.2	10	2561.0	546.3	10	3186.9	826.7
20	1991.5	336.3	20	2571.0	550.4	20	3197.8	832.0
30	2000.9	339.3	30	2581.0	554.5	30	3208.8	837.3
40	2010.2	342.4	40	2591.0	558.6	40	3219.7	842.7
50	2019.6	345.5	50	2601.1	562.8	50	3230.7	848.1
39	2029.0	348.6	49	2611.2	566.9	59	3241.7	853.5
10	2038.4	351.8	10	2621.2	571.1	10	3252.7	858.9
20	2047.8	354.9	20	2631.3	575.3	20	3263.7	864.3
30	2057.2	358.1	30	2641.4	579.5	30	3274.8	869.8
40	2066.6	361.3	40	2651.5	583.8	40	3285.8	875.3
50	2076.0	364.5	50	2661.6	588.0	50	3296.9	880.8
40	2085.4	367.7	50	2671.8	592.3	60	3308.0	886.4
10	2094.9	371.0	10	2681.9	596.6	10	3319.1	892.0
20	2104.3	374.2	20	2692.1	600.9	20	3330.3	897.5
30	2113.8	377.5	30	2702.3	605.3	30	3341.4	903.2
40	2123.3	380.8	40	2712.5	609.6	40	3352.6	908.8
50	2132.7	384.1	50	2722.7	614.0	50	3363.8	914.5

Table V.—Tangents and Externals to a 1° Curve.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
61°	3375.0	920.2	**71°**	4086.9	1308.2	**81°**	4893.6	1805.3
10′	3386.3	925.9	10′	4099.5	1315.6	10′	4908.0	1814.7
20	3397.5	931.6	20	4112.1	1322.9	20	4922.5	1824.1
30	3408.8	937.3	30	4124.8	1330.3	30	4937.0	1833.6
40	3420.1	943.1	40	4137.4	1337.7	40	4951.5	1843.1
50	3431.4	948.9	50	4150.1	1345.1	50	4966.1	1852.6
62	3442.7	954.8	**72**	4162.8	1352.6	**82**	4980.7	1862.2
10	3454.1	960.6	10	4175.6	1360.1	10	4995.4	1871.8
20	3465.4	966.5	20	4188.5	1367.6	20	5010.0	1881.5
30	3476.8	972.4	30	4201.2	1375.2	30	5024.8	1891.2
40	3488.3	978.3	40	4214.0	1382.8	40	5039.5	1900.9
50	3499.7	984.3	50	4226.8	1390.4	50	5054.3	1910.7
63	3511.1	990.2	**73**	4239.7	1398.0	**83**	5069.2	1920.5
10	3522.6	996.2	10	4252.6	1405.7	10	5084.0	1930.4
20	3534.1	1002.3	20	4265 6	1413.5	20	5099.0	1940.3
30	3545.6	1008.3	30	4278.5	1421.2	30	5113.9	1950.3
40	3557.2	1014.4	40	4291.5	1429.0	40	5128.9	1960.2
50	3568.7	1020.5	50	4304.6	1436.8	50	5143.9	1970.3
64	3580.3	1026.6	**74**	4317.6	1444.6	**84**	5159.0	1980.4
10	3591.9	1032.8	10	4330.7	1452.5	10	5174.1	1990.5
20	3603.5	1039.0	20	4343.8	1460.4	20	5189.3	2000.6
30	3615.1	1045.2	30	4356.9	1468.4	30	5204.4	2010.8
40	3626.8	1051.4	40	4370.1	1476.4	40	5219.7	2021.1
50	3638.5	1057.7	50	4383.3	1484.4	50	5234.9	2031.4
65	3650.2	1063.9	**75**	4396.5	1492.4	**85**	5250.3	2041.7
10	3661.9	1070.2	10	4409.8	1500.5	10	5265.6	2052.1
20	3673.7	1076.6	20	4423.1	1508.6	20	5281.0	2062.5
30	3685.4	1082.9	30	4436.4	1516.7	30	5296.4	2073.0
40	3697.2	1089.3	40	4449.7	1524.9	40	5311.9	2083.5
50	3709.0	1095.7	50	4463.1	1533.1	50	5327.4	2094.1
66	3720.9	1102.2	**76**	4476.5	1541.4	**86**	5343.0	2104.7
10	3732.7	1108.6	10	4489.9	1549.7	10	5358.6	2115.3
20	3744.6	1115.1	20	4503.4	1558.0	20	5374.2	2126.0
30	3756.5	1121.7	30	4516.9	1566.3	30	5389.9	2136.7
40	3768.5	1128.2	40	4530.4	1574.7	40	5405.6	2147.5
50	3780.4	1134.8	50	4544.0	1583.1	50	5421.4	2158.4
67	3792.4	1141.4	**77**	4557.6	1591.6	**87**	5437.2	2169.2
10	3804.4	1148.0	10	4571.2	1600.1	10	5453.1	2180.2
20	3816.4	1154.7	20	4584.8	1608.6	20	5469.0	2191.1
30	3828.4	1161.3	30	4598.5	1617.1	30	5484.9	2202.2
40	3840.5	1168.1	40	4612.2	1625.7	40	5500.9	2213.2
50	3852.6	1174.8	50	4626.0	1634.4	50	5517.0	2224.3
68	3864.7	1181.6	**78**	4639.8	1643.0	**88**	5533.1	2235.5
10	3876.8	1188.4	10	4653.6	1651.7	10	5549.2	2246.7
20	3889.0	1195.2	20	4667.4	1660.5	20	5565.4	2258.0
30	3901.2	1202.0	30	4681.3	1669.2	30	5581.6	2269.3
40	3913.4	1208.9	40	4695.2	1678.1	40	5597.8	2280.6
50	3925.6	1215.8	50	4709.2	1686.9	50	5614.2	2292.0
69	3937.9	1222.7	**79**	4723.2	1695.8	**89**	5630.5	2303.5
10	3950.2	1229.7	10	4737.2	1704.7	10	5646.9	2315.0
20	3962.5	1236.7	20	4751.2	1713.7	20	5663.4	2326.6
30	3974.8	1243.7	30	4765.3	1722.7	30	5679.9	2338.2
40	3987.2	1250.8	40	4779.4	1731.7	40	5696.4	2349.8
50	3999.5	1257.9	50	4793.6	1740.8	50	5713.0	2361.5
70	4011.9	1265.0	**80**	4807.7	1749.9	**90**	5729.7	2373.3
10	4024.4	1272.1	10	4822.0	1759.0	10	5746.3	2385.1
20	4036.8	1279.3	20	4836.2	1768.2	20	5763.1	2397.0
30	4049.3	1286.5	30	4850.5	1777.4	30	5779.9	2408.9
40	4061.8	1293.6	40	4864.8	1786.7	40	5796.7	2420.9
50	4074.4	1300.9	50	4879.2	1796.0	50	5813.6	2432.9

Table V.—Tangents and Externals to a 1° Curve.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
91°	5830.5	2444.9	**101°**	6950.6	3278.1	**111°**	8336.7	4386.1
10′	5847.5	2457.1	10′	6971.3	3294.1	10′	8362.7	4407.6
20	5864.6	2469.3	20	6992.0	3310.1	20	8388.9	4429.2
30	5881.7	2481.5	30	7012.7	3326.1	30	8415.1	4450.9
40	5898.8	2493.8	40	7033.6	3342.3	40	8441.5	4472.7
50	5916.0	2506.1	50	7054.5	3358.5	50	8468.0	4494.6
92	5933.2	2518.5	**102**	7075.5	3374.9	**112**	8494.6	4516.6
10	5950.5	2531.0	10	7096.6	3391.2	10	8521.3	4538.8
20	5967.9	2543.5	20	7117.8	3407.7	20	8548.1	4561.1
30	5985.3	2556.0	30	7139.0	3424.3	30	8575.0	4583.4
40	6002.7	2568.6	40	7160.3	3440.9	40	8602.1	4606.0
50	6020.2	2581.3	50	7181.7	3457.6	50	8629.3	4628.6
93	6037.8	2594.0	**103**	7203.2	3474.4	**113**	8656.6	4651.3
10	6055 4	2606.8	10	7224.7	3491.3	10	8684.0	4674.2
20	6073.1	2619.7	20	7246.3	3508.2	20	8711.5	4697.2
30	6090.8	2632.6	30	7268.0	3525.2	30	8739.2	4720.3
40	6108.6	2645.5	40	7289.8	3542.4	40	8767.0	4743.6
50	6126.4	2658.5	50	7311.7	3559.6	50	8794.9	4766.9
94	6144.3	2671.6	**104**	7333.6	3576.8	**114**	8822.9	4790.4
10	6162.6	2684.7	10	7355.6	3594.2	10	8851.0	4814.1
20	6180.2	2697.9	20	7377.8	3611.7	20	8879.3	4837.8
30	6198.3	2711.2	30	7399.9	3629.2	30	8907.7	4861.7
40	6216.4	2724.5	40	7422.2	3646.8	40	8936.3	4885.7
50	6234.6	2737.9	50	7444.6	3664.5	50	8965.0	4909.9
95	6252.8	2751.3	**105**	7467.0	3682.3	**115**	8993.8	4934.1
10	6271.1	2764.8	10	7489.6	3700.2	10	9022.7	4958.6
20	6289.4	2778.3	20	7512.2	3718.2	20	9051.7	4983.1
30	6307.9	2792.0	30	7534.9	3736.2	30	9080.9	5007.8
40	6326.3	2805.6	40	7557.7	3754.4	40	9110.3	5032.6
50	6344.8	2819.4	50	7580.5	3772.6	50	9139.8	5057.6
96	6363.4	2833.2	**106**	7603.5	3791.0	**116**	9169.4	5082.7
10	6382.1	2847.0	10	7626.6	3809.4	10	9199.1	5107.9
20	6400.8	2861.0	20	7649.7	3827.9	20	9229.0	5133.3
30	6419.5	2875.0	30	7672.9	3846.5	30	9259.0	5158.8
40	6438.4	2889.0	40	7696.3	3865.2	40	9289.2	5184.5
50	6457.3	2903.1	50	7719.7	3884.0	50	9319.5	5210.3
97	6476.2	2917.3	**107**	7743.2	3902.9	**117**	9349.9	5236.2
10	6495.2	2931.6	10	7766.8	3921.9	10	9380.5	5262.3
20	6514.3	2945.9	20	7790.5	3940.9	20	9411.3	5288.6
30	6533.4	2960.3	30	7814.3	3960.1	30	9442.2	5315.0
40	6552.6	2974.7	40	7838.1	3979.4	40	9473.2	5341.5
50	6571.9	2989.2	50	7862.1	3998.7	50	9504.4	5368.2
98	6591.2	3003.8	**108**	7886.2	4018.2	**118**	9535.7	5395.1
10	6610.6	3018.4	10	7910.4	4037.8	10	9567.2	5422.1
20	6630.1	3033.1	20	7934.6	4057.4	20	9598.9	5449.2
30	6649.6	3047.9	30	7959.0	4077.2	30	9630.7	5476.5
40	6669.2	3062.8	40	7983.5	4097.1	40	9662.6	5504.0
50	6688.8	3077.7	50	8008.0	4117.0	50	9694.7	5531.7
99	6708.6	3092.7	**109**	8032.7	4137.1	**119**	9727.0	5559.4
10	6728.4	3107.7	10	8057.4	4157.3	10	9759.4	5587.4
20	6748.2	3122.9	20	8082.3	4177.5	20	9792.0	5615.5
30	6768.1	3138.1	30	8107.3	4197.9	30	9824.8	5643.8
40	6788.1	3153.3	40	8132.3	4218.4	40	9857.7	5672.3
50	6808.2	3168.7	50	8157.5	4239.0	50	9890.8	5700.9
100	6828.3	3184.1	**110**	8182.8	4259.7	**120**	9924.0	5729.7
10	6848.5	3199.6	10	8208.2	4280.5	10	9957.5	5758.6
20	6868.8	3215.1	20	8233.7	4301.4	20	9991.0	5787.7
30	6889.2	3230.8	30	8259.3	4322.4	30	10025.0	5817.0
40	6909.6	3246.5	40	8285.0	4343.6	40	10059.0	5846.5
50	6930.1	3262.3	50	8310.8	4364.8	50	10093.0	5876.1

Table VI.—Corrections for Tangents and Externals.

These corrections are to be added to the approximate values, found by dividing the tangent, or external, for a 1° curve (Table IV) by the degree of curve, in order to obtain the true tangents, or externals. Intermediate values may be obtained by interpolation.

For Tangents Add

Central Angle	Degree of Curve													
	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°	.03	.06	.09	.13	.16	.19	.22	.25	.28	.31	.34	.38	.42	.46
15°	.04	.10	.14	.19	.24	.29	.34	.39	.45	.51	.53	.58	.63	.68
20°	.06	.13	.19	.26	.32	.39	.45	.51	.58	.65	.72	.79	.84	.90
25°	.08	.16	.24	.33	.40	.49	.58	.67	.75	.83	.90	.99	1.06	1.14
30°	.10	.19	.29	.39	.49	.59	.69	.79	.89	.99	1.09	1.20	1.29	1.39
35°	.11	.22	.34	.47	.58	.69	.70	.81	.92	1.04	1.29	1.42	1.54	1.66
40°	.13	.26	.40	.53	.67	.80	.93	1.06	1.20	1.34	1.49	1.64	1.79	1.94
45°	.15	.30	.44	.60	.76	.91	1.06	1.21	1.37	1.52	1.70	1.87	2.04	2.21
50°	.17	.34	.51	.68	.85	1.02	1.19	1.36	1.54	1.72	1.91	2.10	2.29	2.48
55°	.19	.38	.57	.76	.95	1.14	1.32	1.52	1.72	1.92	2.14	2.35	2.56	2.77
60°	.21	.42	.63	.84	1.05	1.27	1.49	1.71	1.94	2.17	2.38	2.60	2.83	3.07
65°	.23	.46	.69	.93	1.16	1.40	1.64	1.88	2.13	2.38	2.63	2.88	3.13	3.39
70°	.25	.51	.76	1.02	1.28	1.54	1.80	2.06	2.33	2.60	2.88	3.16	3.44	3.72
75°	.27	.56	.83	1.12	1.40	1.69	1.98	2.27	2.57	2.87	3.16	3.47	3.78	4.09
80°	.30	.61	.91	1.22	1.53	1.84	2.15	2.46	2.78	3.10	3.44	3.78	4.12	4.46
85°	.33	.66	1.00	1.33	1.68	2.02	2.36	2.70	3.05	3.40	3.77	4.14	4.55	4.89
90°	.36	.72	1.09	1.45	1.83	2.20	2.57	2.94	3.32	3.70	4.10	4.50	4.91	5.32
95°	.39	.79	1.19	1.55	2.00	2.40	2.80	3.20	3.61	4.02	4.40	4.98	5.38	5.83
100°	.43	.86	1.30	1.74	2.18	2.62	3.06	3.50	3.95	4.40	4.88	5.37	5.85	6.34
110°	.51	1.03	1.56	2.08	2.61	3.14	3.67	4.21	4.76	5.31	5.86	6.43	7.01	7.60
120°	.62	1.25	1.93	2.52	3.16	3.81	4.45	5.11	5.77	6.44	7.12	7.80	8.50	9.22

For Externals Add

Central Angle	Degree of Curve													
	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°	.001	.003	.004	.006	.007	.008	.009	.011	.012	.014	.015	.017	.018	.020
15°	.003	.007	.010	.014	.018	.023	.027	.029	.032	.035	.039	.043	.047	.051
20°	.006	.011	.017	.022	.028	.034	.038	.045	.051	.057	.063	.070	.076	.083
25°	.009	.018	.027	.036	.046	.056	.065	.074	.083	.093	.106	.120	.127	.135
30°	.013	.025	.038	.051	.065	.078	.090	.103	.116	.129	.149	.170	.179	.188
35°	.018	.035	.054	.072	.086	.109	.131	.153	.175	.197	.213	.230	.247	.264
40°	.023	.046	.070	.093	.117	.141	.172	.203	.234	.265	.277	.290	.315	.341
45°	.030	.060	.093	.119	.153	.184	.216	.254	.289	.325	.351	.378	.411	.445
50°	.037	.075	.116	.151	.189	.227	.266	.305	.345	.384	.425	.467	.508	.550
55°	.046	.093	.142	.188	.236	.283	.332	.381	.420	.479	.530	.582	.641	.700
60°	.056	.112	.168	.225	.283	.340	.398	.457	.516	.575	.636	.697	.774	.851
65°	.067	.135	.204	.273	.343	.412	.483	.554	.625	.697	.711	.845	.922	1.01
70°	.080	.159	.240	.321	.403	.485	.568	.652	.735	.819	.906	.994	1.08	1.17
75°	.095	.182	.286	.383	.480	.578	.678	.777	.877	.977	1.07	1.18	1.29	1.39
80°	.110	.220	.332	.445	.558	.671	.787	.903	1.02	1.13	1.25	1.38	1.50	1.62
85°	.128	.259	.391	.524	.657	.790	.926	1.06	1.20	1.34	1.47	1.62	1.76	1.91
90°	.149	.299	.450	.603	.756	.910	1.07	1.22	1.38	1.54	1.70	1.87	2.03	2.20
95°	.174	.350	.522	.706	.985	1.06	1.25	1.43	1.62	1.80	1.99	2.18	2.38	2.53
100°	.200	.401	.604	.809	1.01	1.22	1.43	1.64	1.85	2.06	2.28	2.50	2.73	2.96
110°	.268	.536	.806	1.08	1.35	1.63	1.91	2.20	2.48	2.76	3.05	3.35	3.66	3.96
120°	.360	.721	1.08	1.45	1.82	2.19	2.57	2.95	3.33	3.72	4.11	4.50	4.91	5.32

Table VII.—Corrections for Sub-Chords and Long Chords.

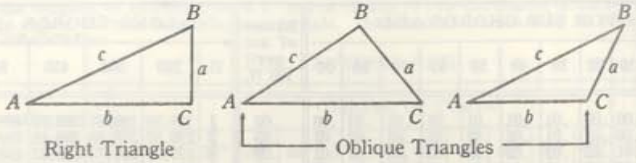
For Sub-Chords Add										Excess of arc per 100 ft.	Long Chords				
D	10	20	30	40	50	60	70	80	90		D	200	300	400	500
4°	.00	.00	.01	.01	.01	.01	.01	.01	.00	.02	1	199.99	299.97	399.92	499.85
6	.00	.01	.01	.02	.02	.02	.02	.01	.01	.05	2	199.97	299.88	399.70	499.39
8	.01	.02	.02	.03	.03	.03	.03	.02	.01	.08	3	199.93	299.73	399.32	498.63
10	.01	.02	.03	.04	.05	.05	.05	.04	.02	.13	4	199.88	299.51	398.78	497.57
12	.02	.04	.05	.06	.07	.07	.07	.05	.03	.18	5	199.81	299.24	398.10	496.20
14	.02	.05	.07	.08	.09	.10	.09	.07	.04	.25	6	199.73	298.90	397.26	494.53
16	.03	.06	.09	.11	.12	.12	.12	.09	.05	.33	7	199.63	298.51	396.28	492.57
18	.04	.08	.11	.14	.15	.16	.15	.12	.07	.41	8	199.51	298.05	395.14	490.31
20	.05	.10	.14	.17	.19	.20	.18	.15	.09	.51	9	199.38	297.54	393.86	487.75
22	.06	.12	.17	.21	.23	.24	.22	.18	.10	.62	10	199.24	296.96	392.42	484.90
24	.07	.14	.20	.25	.28	.28	.26	.21	.12	.74	12	198.90	295.63	389.12	478.34
26	.09	.17	.24	.29	.32	.33	.31	.25	.15	.86	14	198.51	294.06	385.22	470.65
28	.10	.19	.27	.34	.37	.38	.36	.29	.17	1.00	16	198.05	292.25	380.76	461.86
30	.11	22	.31	.39	.43	.44	.41	.33	.19	1.15	18	197.54	290.21	375.74	452.02
32	.13	.25	.36	.44	.49	.50	.47	.38	.22	1.31	20	196.90	287.94	370.17	441.15
34	.15	.28	.40	.50	.55	.57	.53	.43	.25	1.48	22	196.32	285.44	364.06	429.30
36	.17	.32	.45	.56	.62	.64	.59	.48	.28	1.66	24	195.63	282.71	357.43	416.53
38	.18	.36	.51	.62	.70	.71	.66	.53	.31	1.86	26	194.87	279.76	350.30	402.89
40	.21	.40	.56	.69	.77	.79	.73	.59	.35	2.06	28	194.06	276.59	342.69	388.42
42	.23	.44	.62	.76	.85	.87	.81	.65	.38	2.28	30	193.18	273.20	334.61	373.20
44	.25	.48	.68	.84	.94	.96	.89	.72	.42	2.50	32	192.25	269.61	326.08	357.28
46	.27	.52	.75	.92	1.02	1.05	.98	.78	.46	2.74	34	191.26	265.81	317.12	340.73
48	.30	.57	.81	1.00	1.12	1.14	1.06	.86	.50	2.99	36	190.21	261.80	307.77	323.61
50	.32	.62	.89	1.09	1.21	1.24	1.15	.93	.55	3.24	38	189.10	257.60	298.03	305.99
52	.35	.67	.96	1.18	1.31	1.35	1.25	1.01	.59	3.52	40	187.94	253.21	287.94	287.94
54	.38	.73	1.04	1.28	1.42	1.46	1.35	1.09	.64	3.80	42	186.72	248.63	277.51	269.54
56	.41	.78	1.12	1.38	1.53	1.57	1.46	1.17	.69	4.09	44	185.44	243.87	266.78	250.85
58	.44	.84	1.20	1.48	1.65	1.69	1.57	1.20	.74	4.40	46	184.10	239.93	255.78	231.95
60	.47	.91	1.29	1.59	1.76	1.81	1.68	1.35	.80	4.72	48	182.71	233.83	244.51	212.92

NOTE.—When a chord of less than 100 ft. is used the corrections given in the above table should be added to the nominal length of chord to get the length which should be used in order that the 100 ft. points will check with those obtained by using the standard 100 ft. chord. Thus in locating a 14° curve by 25 ft. chords measure 25′.06 for each chord. Long chords are useful in passing obstacles.

Table VIII.—Middle Ordinates for Rails in Feet.

Deg. of Curve	Length of Rails							Deg. of Curve	Length of Rails						
	32	30	28	26	24	22	20		32	30	28	26	24	22	20
1°	.022	.020	.016	.013	.011	.009	.008	16°	.356	.313	.273	.236	.200	.170	.139
2	.045	.038	.034	.029	.025	.021	.017	17	.378	.333	.290	.252	.213	.180	.148
3	.067	.058	.051	.044	.037	.031	.026	18	.400	.351	.306	.265	.225	.190	.156
4	.089	.079	.069	.060	.050	.042	.035	19	.423	.371	.324	.280	.238	.201	.165
5	.112	.099	.086	.074	.063	.053	.044	20	.445	.392	.341	.296	.250	.212	.174
6	.134	.117	.102	.088	.076	.064	.052	21	.466	.410	.357	.309	.262	.222	.182
7	.156	.137	.120	.104	.088	.074	.061	22	.487	.430	.375	.325	.275	.233	.191
8	.179	.158	.137	.119	.100	.085	.070	23	.509	.450	.390	.338	.287	.243	.199
9	.201	.175	.153	.133	.112	.095	.078	24	.531	.469	.408	.354	.299	.253	.208
10	.223	.196	.171	.148	.125	.106	.087	25	.552	.486	.424	.367	.311	.263	.216
11	.245	.216	.188	.163	.139	.117	.096	26	.573	.506	.441	.382	.323	.274	.225
12	.268	.236	.206	.179	.151	.128	.105	27	.594	.524	.457	.396	.335	.284	.233
13	.290	.254	.222	.192	.163	.138	.113	28	.618	.545	.475	.411	.348	.294	.242
14	.312	.275	.239	.207	.175	.148	.122	29	.638	.564	.491	.424	.361	.303	.250
15	.334	.295	.257	.223	.188	.159	.131	30	.660	.583	.508	.438	.374	.313	.259

TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

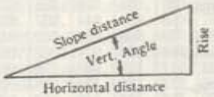
Given	Required	
a, b	A, B, c	$\tan A = \frac{a}{b} = \cot B,\ c = \sqrt{a^2+b^2} = a\sqrt{1+\frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B, b = \sqrt{(c+a)(c-a)} = c\sqrt{1-\frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90° - A,\ b = a \cot A,\ c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90° - A,\ a = b \tan A,\ c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90° - A,\ a = c \sin A,\ b = c \cos A$

Solution of Oblique Triangles

Given	Required	
A, B, a	b, c, C	$b = \frac{a \sin B}{\sin A},\ C = 180° - (A+B),\ c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a},\ C = 180° - (A+B),\ c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A+B = 180° - C, \tan\frac{1}{2}(A-B) = \frac{(a-b)\tan\frac{1}{2}(A+B)}{a+b}$ $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a+b+c}{2},\ \sin\frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{bc}}$, $\sin\frac{1}{2}B = \sqrt{\frac{(s-a)(s-c)}{ac}},\ C = 180° - (A+B)$
a, b, c	Area	$s = \frac{a+b+c}{2}$, area $= \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	area $= \frac{b\,c \sin A}{2}$
A, B, C, a	Area	area $= \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL

Horizontal distance = slope distance multiplied by the cosine of the vertical angle. Thus, for a slope distance of 403.6 ft. and a vertical angle of 4° 40′—the cosine of 4° 40′, taken from a table of natural trigonometrical functions, = .9967, and horizontal distance = 403.6 x .9967 = 402.27 ft.



Horizontal distance also = Slope distance minus slope distance times (1 — cosine of vertical angle). Using the same figures as in the preceding example — Cos. 4° 40′ = .9967. 1 — .9967 = .0033. 403.6 x .0033 = 1.33 ft. Horizontal dist. = 403.6 – 1.33 = 402.27 ft.

When the rise is known, the horizontal distance may be found by the following approximate rule:— the slope distance less the square of the rise divided by twice the slope distance. Thus, for a slope distance of 372.5 ft., and a rise of 15 ft. the horizontal distance =

$$372.5 - \frac{15 \times 15}{2 \times 372.5} = 372.5 - .30 = 372.2 \text{ ft.}$$

Table IX.—Natural Trigonometrical Functions.

Angle	Sin	Tan	Cot	Cos		Angle	Sin	Tan	Cot	Cos	
° ′						° ′					
0	**0**	**0**	**00**	**1**	**90**	**8**	.1392	.1405	7.115	.99027	**82**
10	.0029	.0029	343.8	1	50	10	.1421	.1435	6.968	.98986	50
20	.0058	.0058	171.9	.99998	40	20	.1449	.1465	6.827	.98944	40
30	.0087	.0087	114.6	.99996	30	30	.1478	.1495	6.691	.98902	30
40	.0116	.0116	85.94	.99993	20	40	.1507	.1524	6.561	.98858	20
50	.0145	.0145	68.75	.99989	10	50	.1536	.1554	6.435	.98814	10
1	.0175	.0175	57.29	.99985	**89**	**9**	.1564	.1584	6.314	.98769	**81**
10	.0204	.0204	49.10	.99979	50	10	.1593	.1614	6.197	.98723	50
20	.0233	.0233	42.96	.99973	40	20	.1622	.1644	6.084	.98676	40
30	.0262	.0262	38.19	.99966	30	30	.1650	.1673	5.976	.98629	30
40	.0291	.0291	34.37	.99958	20	40	.1679	.1703	5.871	.98580	20
50	.0320	.0320	31.24	.99949	10	50	.1708	.1733	5.769	.98531	10
2	.0349	.0349	28.64	.99939	**88**	**10**	.1736	.1763	5.671	.98481	**80**
10	.0378	.0378	26.43	.99929	50	10	.1765	.1793	5.576	.98430	50
20	.0407	.0407	24.54	.99917	40	20	.1794	.1823	5.485	.98378	40
30	.0436	.0437	22.90	.99905	30	30	.1822	.1853	5.396	.98325	30
40	.0465	.0466	21.47	.99892	20	40	.1851	.1883	5.309	.98272	20
50	.0494	.0495	20.21	.99878	10	50	.1880	.1914	5.226	.98218	10
3	.0523	.0524	19.08	.99863	**87**	**11**	.1908	.1944	5.145	.98163	**79**
10	.0552	.0553	18.07	.99847	50	10	.1937	.1974	5.066	.98107	50
20	.0581	.0582	17.17	.99831	40	20	.1965	.2004	4.989	.98050	40
30	.0610	.0612	16.35	.99813	30	30	.1994	.2035	4.915	.97992	30
40	.0640	.0641	15.60	.99795	20	40	.2022	.2065	4.843	.97934	20
50	.0669	.0670	14.92	.99776	10	50	.2051	.2095	4.773	.97875	10
4	.0698	.0699	14.30	.99756	**86**	**12**	.2079	.2126	4.705	.97815	**78**
10	.0727	.0729	13.73	.99736	50	10	.2108	.2156	4.638	.97754	50
20	.0756	.0758	13.20	.99714	40	20	.2136	.2186	4.574	.97692	40
30	.0785	.0787	12.71	.99692	30	30	.2164	.2217	4.511	.97630	30
40	.0814	.0816	12.25	.99668	20	40	.2193	.2247	4.449	.97566	20
50	.0843	.0846	11.83	.99644	10	50	.2221	.2278	4.390	.97502	10
5	.0872	.0875	11.43	.99619	**85**	**13**	.2250	.2309	4.331	.97437	**77**
10	.0901	.0904	11.06	.99594	50	10	.2278	.2339	4.275	.97371	50
20	.0929	.0934	10.71	.99567	40	20	.2306	.2370	4.219	.97304	40
30	.0958	.0963	10.39	.99540	30	30	.2334	.2401	4.165	.97237	30
40	.0987	.0992	10.08	.99511	20	40	.2363	.2432	4.113	.97169	20
50	.1016	.1022	9.788	.99482	10	50	.2391	.2462	4.061	.97100	10
6	.1045	.1051	9.514	.99452	**84**	**14**	.2419	.2493	4.011	.97030	**76**
10	.1074	.1080	9.255	.99421	50	10	.2447	.2524	3.962	.96959	50
20	.1103	.1110	9.010	.99390	40	20	.2476	.2555	3.914	.96887	40
30	.1132	.1139	8.777	.99357	30	30	.2504	.2586	3.867	.96815	30
40	.1161	.1169	8.556	.99324	20	40	.2532	.2617	3.821	.96742	20
50	.1190	.1198	8.345	.99290	10	50	.2560	.2648	3.776	.96667	10
7	.1219	.1228	8.144	.99255	**83**	**15**	.2588	.2679	3.732	.96593	**75**
10	.1248	.1257	7.953	.99219	50	10	.2616	.2711	3.689	.96517	50
20	.1276	.1287	7.770	.99182	40	20	.2644	.2742	3.647	.96440	40
30	.1305	.1317	7.596	.99144	30	30	.2672	.2773	3.606	.96363	30
40	.1334	.1346	7.429	.99106	20	40	.2700	.2805	3.566	.96285	20
50	.1363	.1376	7.269	.99067	10	50	.2728	.2836	3.526	.96206	10
					82						**74**
	Cos	Cot	Tan	Sin	Angle		Cos	Cot	Tan	Sin	Angle

Table IX.—Natural Trigonometrical Functions.

Angle	Sin	Tan	Cot	Cos		Angle	Sin	Tan.	Cot	Cos	
° ′						° ′					
16	.2756	.2867	3.487	.96126	**74**	**24**	.4067	.4452	2.246	.91355	**66**
10	.2784	.2899	3.450	.96046	50	10	.4094	.4487	2.229	.91236	50
20	.2812	.2931	3.412	.95964	40	20	.4120	.4522	2.211	.91116	40
30	.2840	.2962	3.376	.95882	30	30	.4147	.4557	2.194	.90996	30
40	.2868	.2994	3.340	.95799	20	40	.4173	.4592	2.177	.90875	20
50	.2896	.3026	3.305	.95715	10	50	.4200	.4628	2.161	.90753	10
17	.2924	.3057	3.271	.95630	**73**	**25**	.4226	.4663	2.145	.90631	**65**
10	.2952	.3089	3.237	.95545	50	10	.4253	.4699	2.128	.90507	50
20	.2979	.3121	3.204	.95459	40	20	.4279	.4734	2.112	.90383	40
30	.3007	.3153	3.172	.95372	30	30	.4305	.4770	2.097	.90259	30
40	.3035	.3185	3.140	.95284	20	40	.4331	.4806	2.081	.90133	20
50	.3062	.3217	3.108	.95195	10	50	.4358	.4841	2.066	.90007	10
18	.3090	.3249	3.078	.95106	**72**	**26**	.4384	.4877	2.050	.89879	**64**
10	.3118	.3281	3.048	.95015	50	10	.4410	.4913	2.035	.89752	50
20	.3145	.3314	3.018	.94924	40	20	.4436	.4950	2.020	.89623	40
30	.3173	.3346	2.989	.94832	30	30	.4462	.4986	2.006	.89493	30
40	.3201	.3378	2.960	.94740	20	40	.4488	.5022	1.991	.89363	20
50	.3228	.3411	2.932	.94646	10	50	.4514	.5059	1.977	.89232	10
19	.3256	.3443	2.904	.94552	**71**	**27**	.4540	.5095	1.963	.89101	**63**
10	.3283	.3476	2.877	.94457	50	10	.4566	.5132	1.949	.88968	50
20	.3311	.3508	2.850	.94361	40	20	.4592	.5169	1.935	.88835	40
30	.3338	.3541	2.824	.94264	30	30	.4617	.5206	1.921	.88701	30
40	.3365	.3574	2.798	.94167	20	40	.4643	.5243	1.907	.88566	20
50	.3398	.3607	2.773	.94068	10	50	.4669	.5280	1.894	.88431	10
20	.3420	.3640	2.747	.93969	**70**	**28**	.4695	.5317	1.881	.88295	**62**
10	.3448	.3673	2.723	.93869	50	10	.4720	.5354	1.868	.88158	50
20	.3475	.3706	2.699	.93769	40	20	.4746	.5392	1.855	.88020	40
30	.3502	.3739	2.675	.93667	30	30	.4772	.5430	1.842	.87882	30
40	.3529	.3772	2.651	.93565	20	40	.4797	.5467	1.829	.87743	20
50	.3557	.3805	2.628	.93462	10	50	.4823	.5505	1.816	.87603	10
21	.3584	.3839	2.605	.93358	**69**	**29**	.4848	.5543	1.804	.87462	**61**
10	.3611	.3872	2.583	.93253	50	10	.4874	.5581	1.792	.87321	50
20	.3638	.3906	2.560	.93148	40	20	.4899	.5619	1.780	.87178	40
30	.3665	.3939	2.539	.93042	30	30	.4924	.5658	1.767	.87036	30
40	.3692	.3973	2.517	.92935	20	40	.4950	.5696	1.756	.86892	20
50	.3719	.4006	2.496	.92827	10	50	.4975	.5735	1.744	.86748	10
22	.3746	.4040	2.475	.92718	**68**	**30**	.5000	.5774	1.732	.86603	**60**
10	.3773	.4074	2.455	.92609	50	10	.5025	.5812	1.720	.86457	50
20	.3800	.4108	2.434	.92499	40	20	.5050	.5851	1.709	.86310	40
30	.3827	.4142	2.414	.92388	30	30	.5075	.5890	1.698	.86163	30
40	.3854	.4176	2.394	.92276	20	40	.5100	.5930	1.686	.86015	20
50	.3881	.4210	2.375	.92164	10	50	.5125	.5969	1.675	.85866	10
23	.3907	.4245	2.356	.92050	**67**	**31**	.5150	.6009	1.664	.85717	**59**
10	.3934	.4279	2.337	.91936	50	10	.5175	.6048	1.653	.85567	50
20	.3961	.4314	2.318	.91822	40	20	.5200	.6088	1.643	.85416	40
30	.3987	.4348	2.300	.91706	30	30	.5225	.6128	1.632	.85264	30
40	.4014	.4383	2.282	.91590	20	40	.5250	.6168	1.621	.85112	20
50	.4041	.4417	2.264	.91472	10	50	.5275	.6208	1.611	.84959	10
					66						**58**
	Cos	Cot	Tan.	Sin	Angle		Cos	Cot	Tan.	Sin	Angle

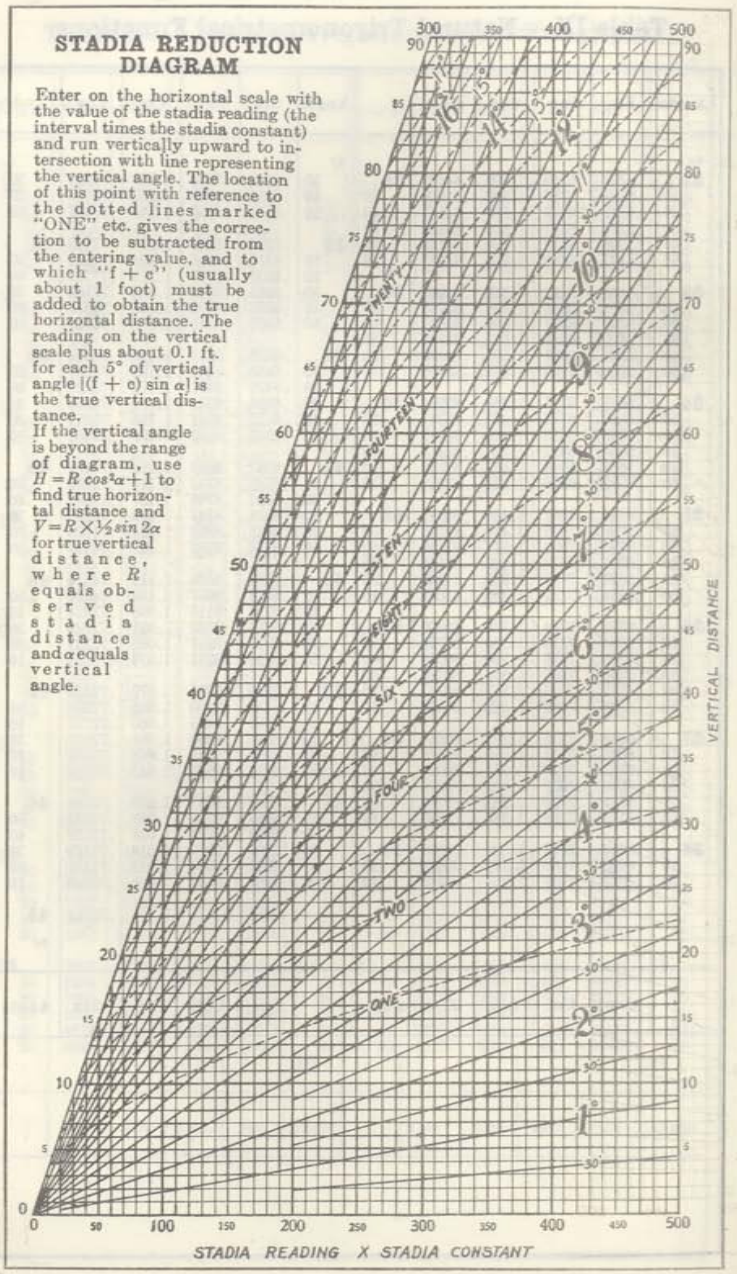
Table IX.—Natural Trigonometrical Functions.

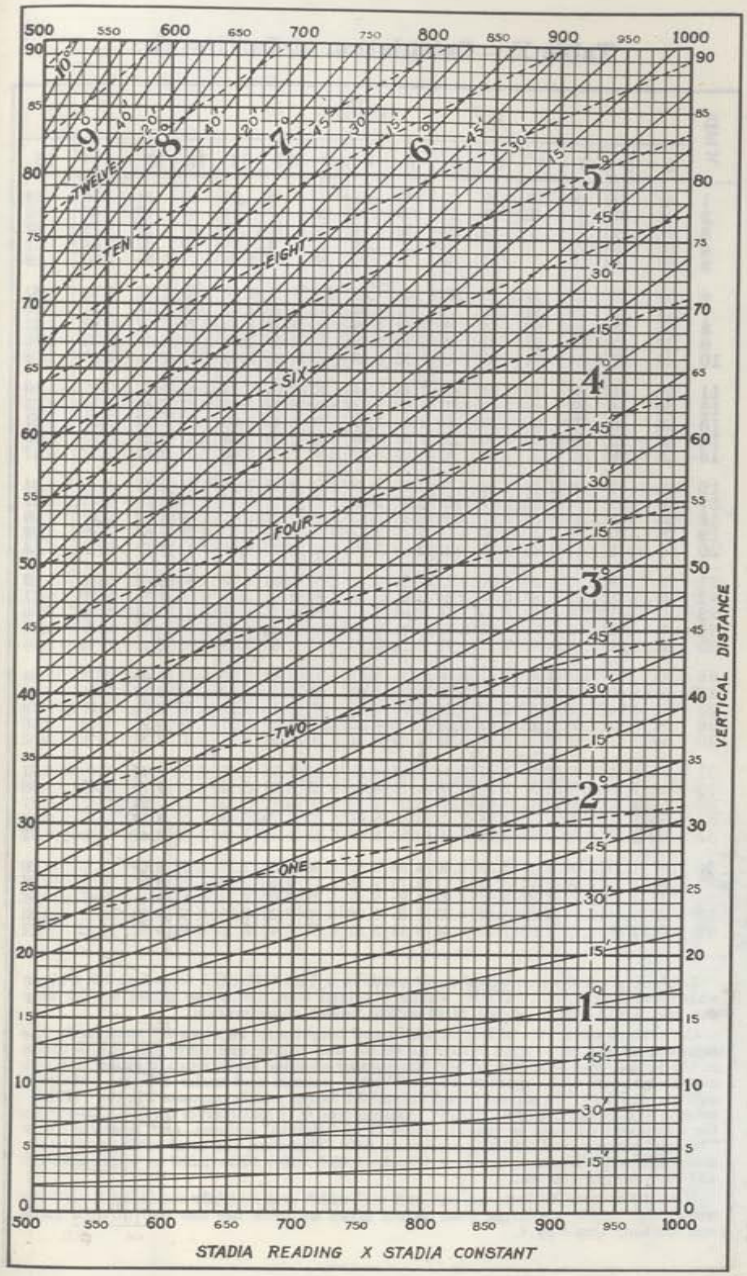
Angle	Sin	Tan	Cot	Cos		Angle	Sin	Tan	Cot	Cos	
° ′						° ′					
32	.5299	.6249	1.600	.84805	**58**	30	.6225	.7954	1.257	.78261	30
10	.5324	.6289	1.590	.84650	50	40	.6248	.8002	1.250	.78079	20
20	.5348	.6330	1.580	.84495	40	50	.6271	.8050	1.242	.77897	10
30	.5373	.6371	1.570	.84339	30						
40	.5398	.6412	1.560	.84182	20	**39**	.6293	.8098	1.235	.77715	**51**
50	.5422	.6453	1.550	.84025	10	10	.6316	.8146	1.228	.77531	50
						20	.6338	.8195	1.220	.77347	40
33	.5446	.6494	1.540	.83867	**57**	30	.6361	.8243	1.213	.77162	30
10	.5471	.6536	1.530	.83708	50	40	.6383	.8292	1.206	.76977	20
20	.5495	.6577	1.520	.83549	40	50	.6406	.8342	1.199	.76791	10
30	.5519	.6619	1.511	.83389	30						
40	.5544	.6661	1.501	.83228	20	**40**	.6428	.8391	1.192	.76604	**50**
50	.5568	.6703	1.492	.83066	10	10	.6450	.8441	1.185	.76417	50
						20	.6472	.8491	1.178	.76229	40
34	.5592	.6745	1.483	.82904	**56**	30	.6494	.8541	1.171	.76041	30
10	.5616	.6787	1.473	.82741	50	40	.6517	.8591	1.164	.75851	20
20	.5640	.6830	1.464	.82577	40	50	.6539	.8642	1.157	.75661	10
30	.5664	.6873	1.455	.82413	30						
40	.5688	.6916	1 446	.82248	20	**41**	.6561	.8693	1.150	.75471	**49**
50	.5712	.6959	1.437	.82082	10	10	.6583	.8744	1.144	.75280	50
						20	.6604	.8796	1.137	.75088	40
35	.5736	.7002	1.428	.81915	**55**	30	.6626	.8847	1.130	.74896	30
10	.5760	.7046	1.419	.81748	50	40	.6648	.8899	1.124	.74703	20
20	.5783	.7089	1.411	.81580	40	50	.6670	.8952	1.117	.74509	10
30	.5807	.7133	1.402	.81412	30						
40	.5831	.7177	1.393	.81242	20	**42**	.6691	.9004	1.111	.74314	**48**
50	.5854	.7221	1.385	.81072	10	10	.6713	.9057	1.104	.74120	50
						20	.6734	.9110	1.098	.73924	40
36	.5878	.7265	1.376	.80902	**54**	30	.6756	.9163	1.091	.73728	30
10	.5901	.7310	1.368	.80730	50	40	.6777	.9217	1.085	.73531	20
20	.5925	.7355	1.360	.80558	40	50	.6799	.9271	1.079	.73333	10
30	.5948	.7400	1.351	.80386	30						
40	.5972	.7445	1.343	.80212	20	**43**	.6820	.9325	1.072	.73135	**47**
50	.5995	.7490	1.335	.80038	10	10	.6841	.9380	1.066	.72937	50
						20	.6862	.9435	1.060	.72737	40
37	.6018	.7536	1.327	.79864	**53**	30	.6884	.9490	1.054	.72537	30
10	.6041	.7581	1.319	.79688	50	40	.6905	.9545	1.048	.72337	20
20	.6065	.7627	1.311	.79512	40	50	.6926	.9601	1.042	.72136	10
30	.6088	.7673	1.303	.79335	30						
40	.6111	.7720	1.295	.79158	20	**44**	.6947	.9657	1.036	.71934	**46**
50	.6134	.7766	1.288	.78980	10	10	.6967	.9713	1.030	.71732	50
						20	.6988	.9770	1.024	.71529	40
38	.6157	.7813	1.280	.78801	**52**	30	.7009	.9827	1.018	.71325	30
10	.6180	.7860	1.272	.78622	50	40	.7030	.9884	1.012	.71121	20
20	.6202	.7907	1.265	.78442	40	50	.7050	.9942	1.006	.70916	10
							.7071	1.	1.	.70711	**45**
											° ′
	Cos	Cot	Tan	Sin	Angle		Cos	Cot	Tan	Sin	Angle

STADIA REDUCTION DIAGRAM

Enter on the horizontal scale with the value of the stadia reading (the interval times the stadia constant) and run vertically upward to intersection with line representing the vertical angle. The location of this point with reference to the dotted lines marked "ONE" etc. gives the correction to be subtracted from the entering value, and to which "f + c" (usually about 1 foot) must be added to obtain the true horizontal distance. The reading on the vertical scale plus about 0.1 ft. for each 5° of vertical angle [(f + c) sin α] is the true vertical distance.

If the vertical angle is beyond the range of diagram, use $H = R \cos^2\alpha + 1$ to find true horizontal distance and $V = R \times \frac{1}{2} \sin 2\alpha$ for true vertical distance, where R equals observed stadia distance and α equals vertical angle.





Don Seal Grass
God must be a C'boy @ heart

"Swingin'"

~~lathe~~
Markers – b/k
Hammer handle

Carl's Blue Printing Reno, NV 8 AM – 5 PM
Sunshine Ln Between Mill & Glendale

→ Tags → Paint
Flags

Ernst Hardware Reno, NV
Kitsky & Moana
Chisel 1" wide

Lisa
We will Return
see you in a little while.
Bill

MARK FROM DENVER

DIAMOND CORE LOGS
CB radio

Bridgeport.
Joan Gaffney
We will be out @ end of August

Furnature <?"

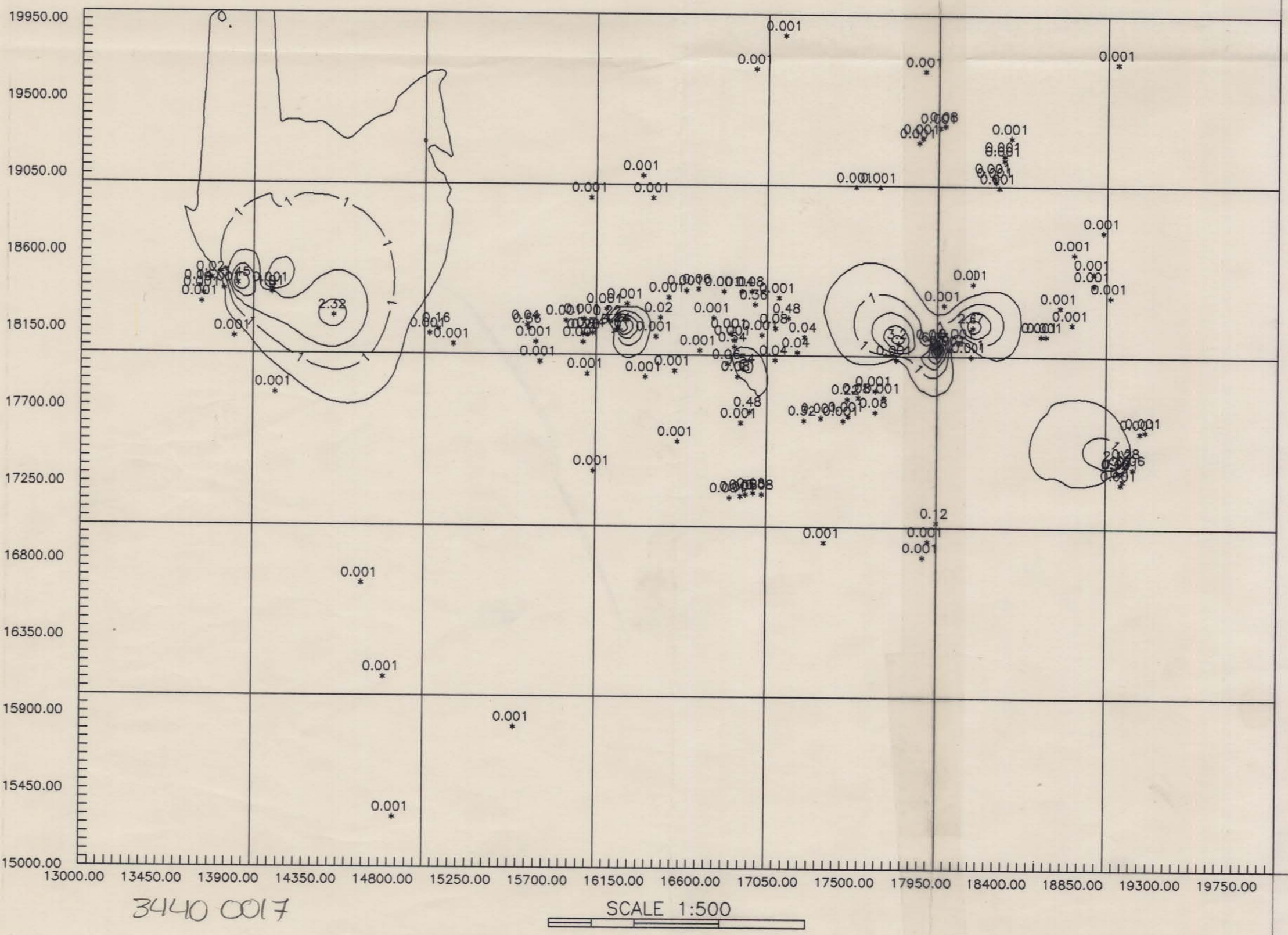
2 stuffed chairs are, ours. (Marks)

– Grant. – Smith
Reclamation

→ Upright Vacume – Roberts.


SAMPLE LOCATIONS
PROPERTY
1"=
3440 0017

PAIUTE 1983 GOLD GEOCHEMISTRY .5 PPM CONTOURS



3440 0017

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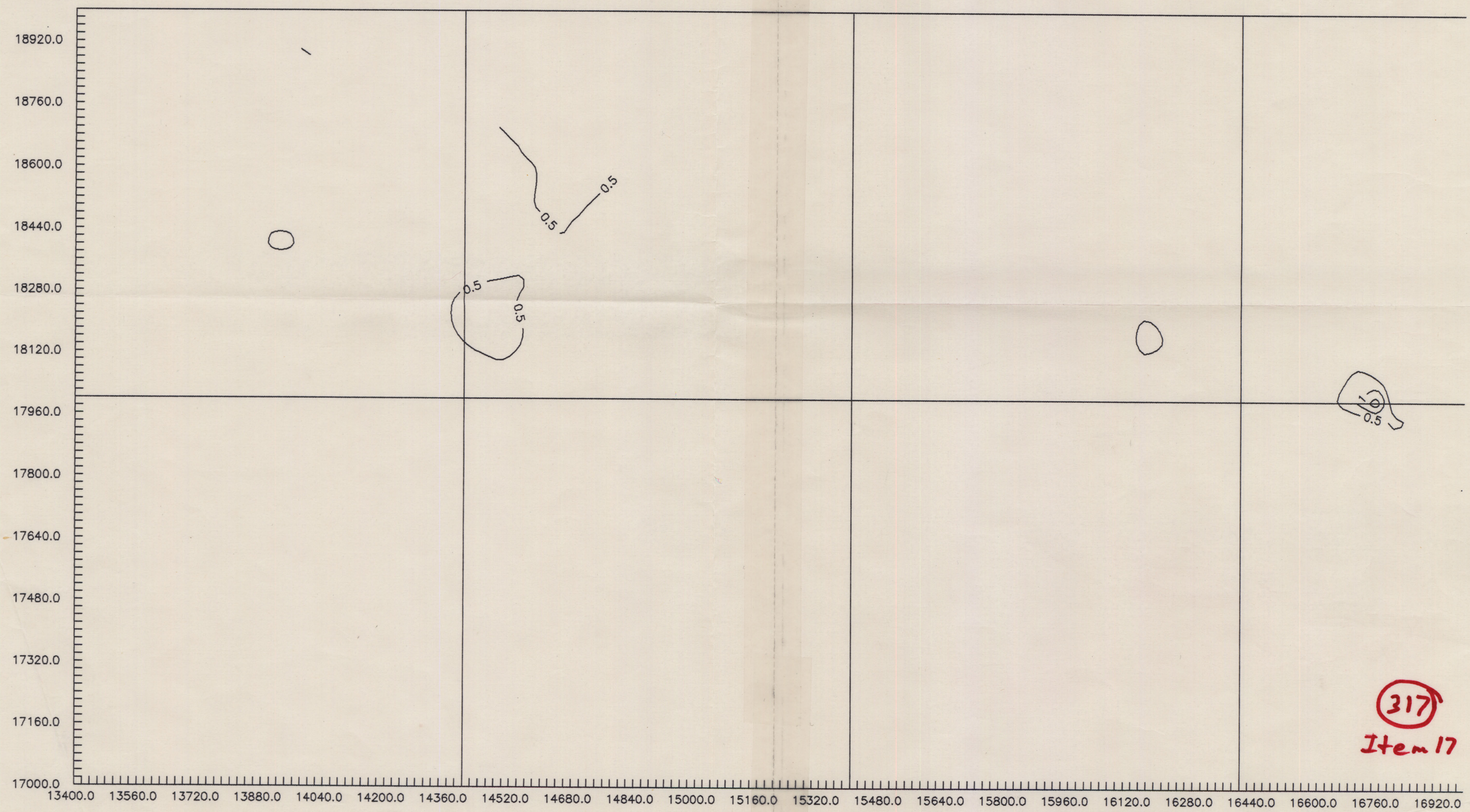
Item 17

GOLD TO SILVER RATIOS – 1983 & 1984 SAMPLING



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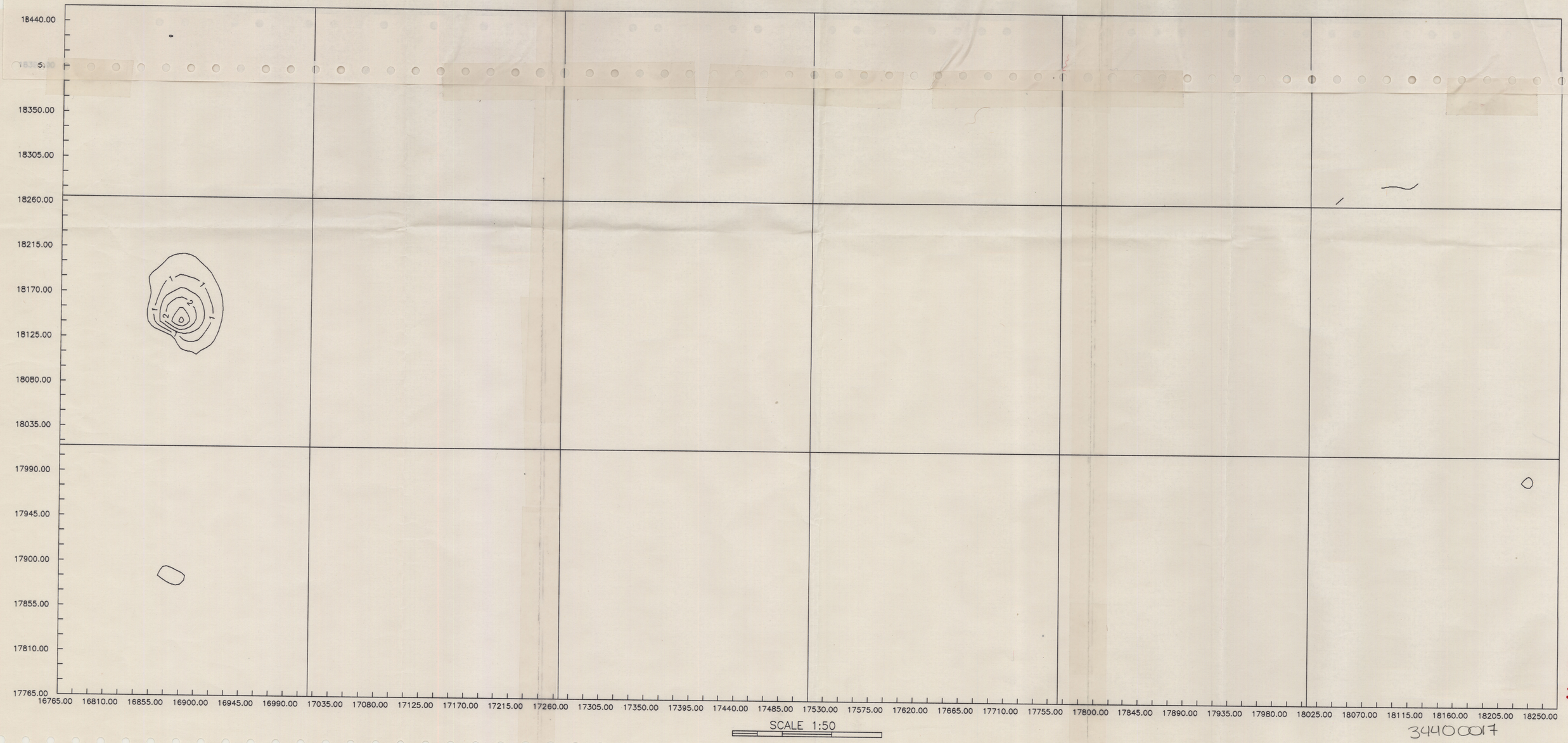
Item 17

3440 0017

1984 SILVER GEOCHEMISTRY .5 OPT CONTOURS



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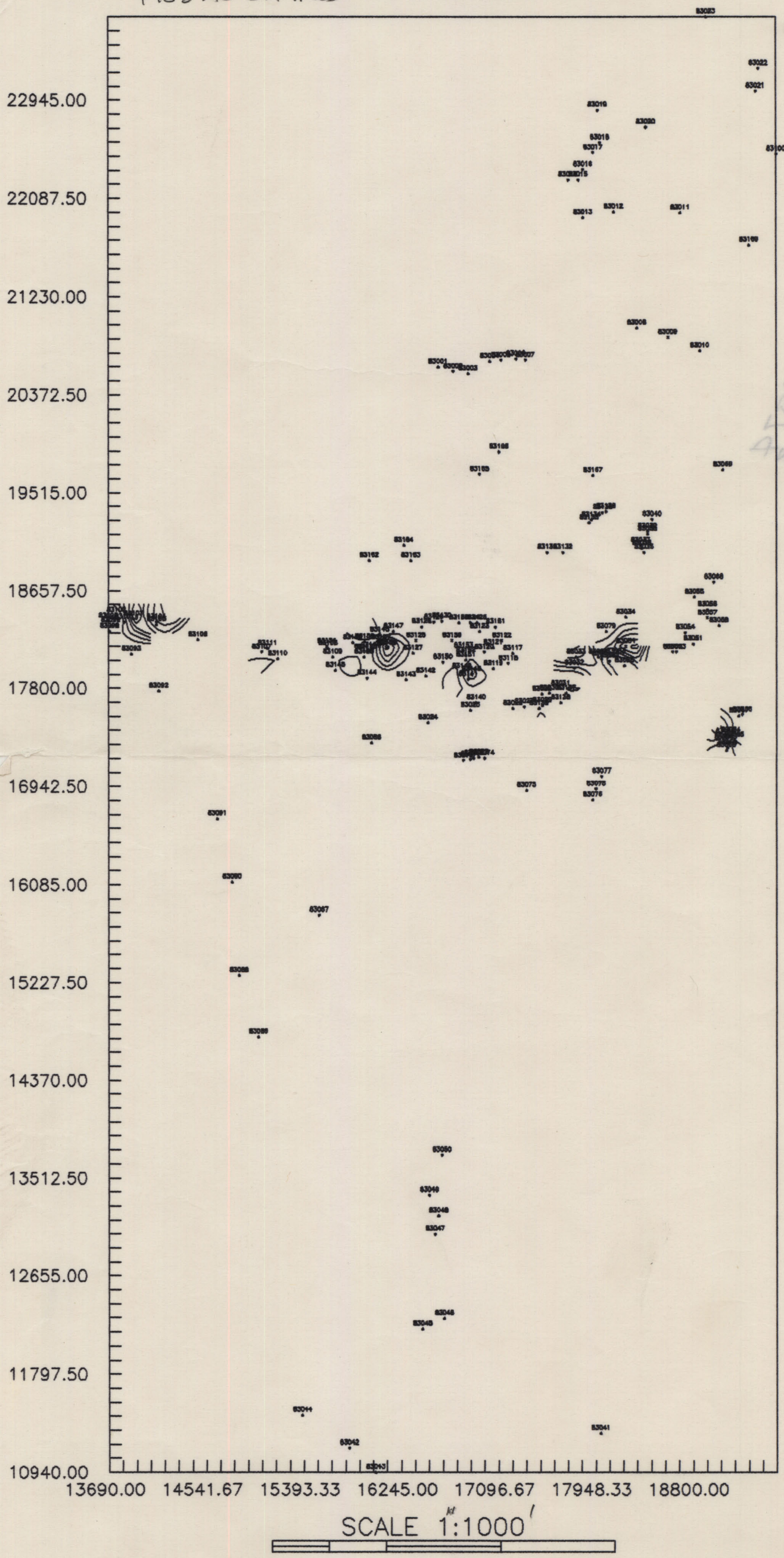
Item 17

3440017

1983 AU SAMPLES .5 PPM CONTOURS

ROW 1 4:27:30
32:17
ROW 3
2.4 min / rover

USE 50' GRID



SCALE 1:1000'

3/4/10 001

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Item 17

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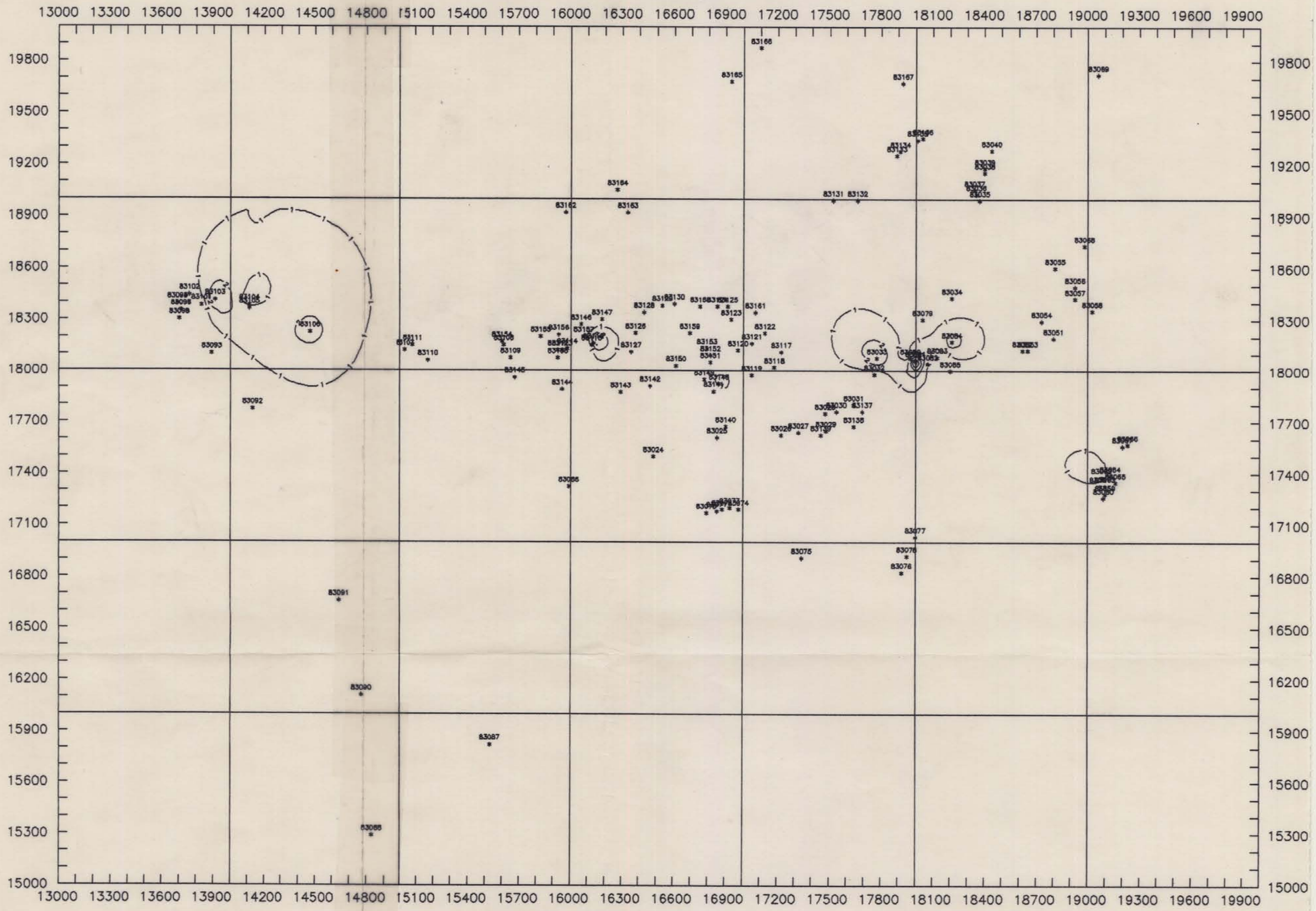
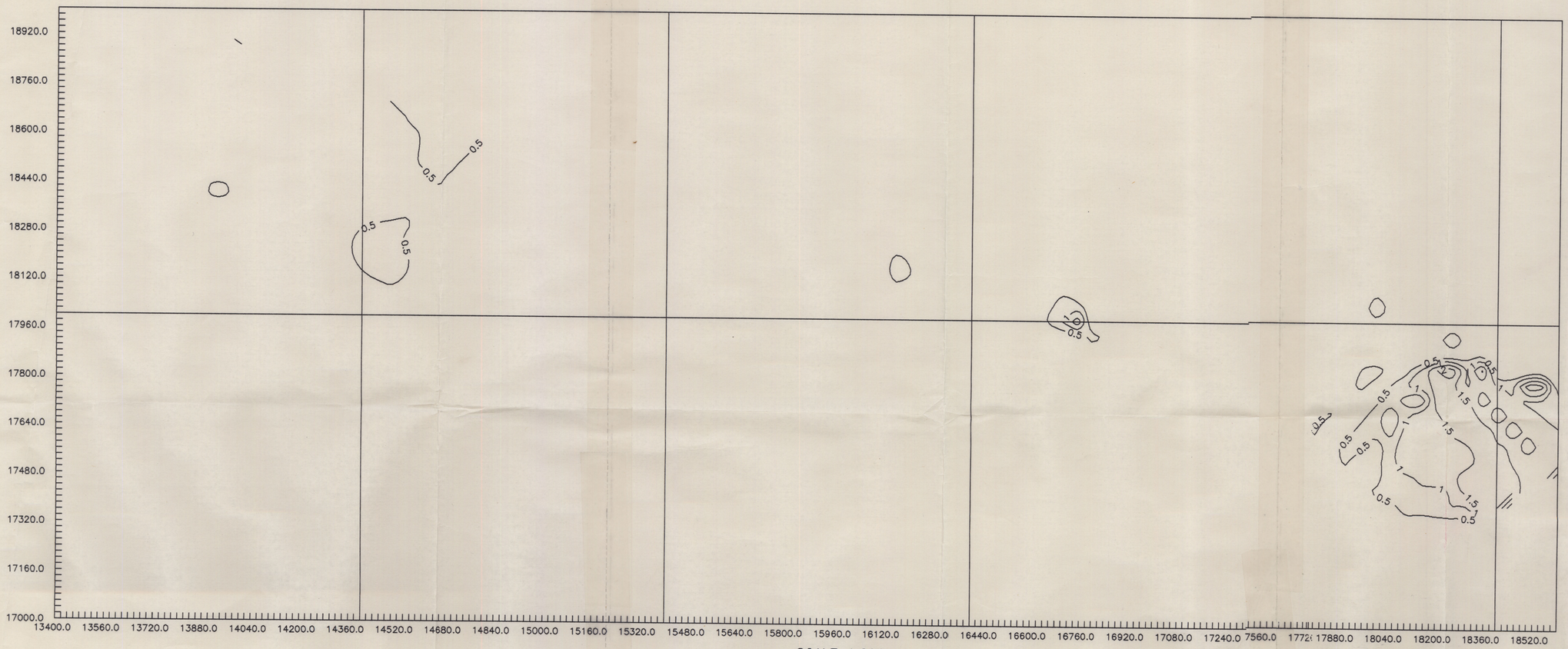
Item 17

1983 Au Geochemistry, PPM Au



3440 0017

GOLD TO SILVER RATIOS – 1983 & 1984 SAMPLING



SCALE 1:200

3440 0017

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Item 17

1983 SAMPLE LOCATIONS