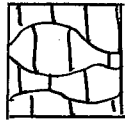
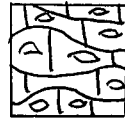


Lithologic Key



non vesic
Basalt,
Basaltic Andesite or
Andesite Flow



vesic.
Basalt, Basaltic Andesite or
Andesite flow



ash, cinders + scoria



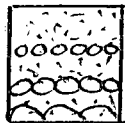
Tuffs



agglomerates



Flow
Breccias



volcaniclastic



ASH FLOW



Lahar



Dike

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS





Fracture Descriptions

abbreviation		
·mnr,	minor	1 fracture per 2 ft interval
few	few	2-4 fractures per 2 ft interval
mod.	moderate	5-8 fractures per 2 ft interval
stg.	strong	8-10 fract. per 2 ft. interval
Ext.	Extensive	>10 fract. per 2 ft. interval

other abbrev.

rand.	-	random
par.	-	parallel
pty.	-	platy
sev.	-	several
brkn.	-	broken
fracs	-	fractures
dir.	-	direction
unconsol.	-	unconsolidated.
v.	-	very
alter.	-	altered
zns.	-	zones
dk.	-	dark
med.	-	medium
sl.	-	slightly
ang.	-	angular
subang.	-	subangular
lt.	-	light
FeOx	-	iron oxide
gmdms.	-	ground mass
porph.	-	porphyritic

* - indicates sample in skeleton Core

Box #	Box interval	Fractures (90°=vert.)	Depth (ft.)	Lithology	Lithologic Description	Alteration
1	453'-463'	rand 75° random 65° 25' 70°	450-460		453'-512' Basaltic Andesite med. grey, coarsely porphyritic; 15% plagiophenos. ($\leq 7\text{mm}$); 1% olivine phenos. ($\leq 2\text{mm}$); mostly non vesicular	
2	463'-471.5'	mmr.	460-470			
3	471.5'-480.5'	0° 55° rand 65°	470-480		$\sim 480'$, olivine phenos larger ($\leq 3\text{mm}$)	FeOx coating on 0° frac
4	480.5'-490'	none	480-490			FeOx on fract.
5	490'-499'	mmr. random 50° 70°	500-510			
6	499'-509'	mmr. 60° 75°	510-520		506' - 509' vesicular - vesic. open ($< 4\text{mm}$)	
7	509'-511'	unconsol.	520-530		512' - 705' sanders = ash - scoria; interbedded layers of poorly consolidated lapilli tuffs and unconsolidated red ash and sanders. Sharp contact with overlying basalt s. 512' - 519' ash and sanders with $< 5\%$ plagiophenos; 519' - 545' lapilli tuffs with heterolithic, subangular to subrounded, vesicular lapilli; showing crude grading as lapilli increase from 2mm to 4cm over this interval.	
8	511'-536'	unconsol.	530-540			
9	536'-545'	unconsol.	540-550			
10						

* sample in skeleton core

50 SHEETS
100 SHEETS
200 SHEETS



Box #	Box interval	Fractures	Depth	Lithology	Lithologic Description	Alteration
10	545' - 555'	unconsol.	540'		Lithologic Description 545' - 605' unconsolidated red ash, cinders and heterolithic capilli.	Alteration
11	565' - 565'	unconsol.	560'			
1a	565' - 575'	unconsol.	570'			
13	575' - 591'	unconsol.	580'			
14	591' - 605'	unconsol.	600'			
15	605' - 616'	unconsol.	610'			
16	616' - 628'	unconsol.	620'			
17	628' - 641'	unconsol.	640'			
18	641' - 654'	unconsol.	650'			
19	654' - 664'	unconsol.	660'			
20	664' - 673'	unconsol.	670'			
21	673' - 687.5'	unconsol.	680'			
2a	687.5' - 704'	unconsol.	690'			

605' - 673' still unconsolidated, however capilli becomes more homogeneous (all are med. grey vesicular basalt) and ash loses red color - becomes brn. to med. grey.

673' - 704' still unconsolidated or poorly consolidated, ash becomes oxidized red again and v. fine grained, amount, size and vesicularity of capilli decrease.



Box #	Box Interval	Fractures	Depth	Lithology	Lithologic Description	Alteration
22						
23	704'-712'	mod. rand 50°	710		705'-716.5' Basaltic Andesite: mod. porph; $\leq 5\%$ plag. phenos. (<math>< 2\text{mm}</math>); $\leq 2\%$ olivine phenos. (<math>< 1\text{mm}</math>). Slightly vesicular - vesicles open and elongated horiz. (<math>< 2\text{cm}</math>). Oxidation of matrix gives rock a pink color. Gradational contact with overlying anders and ash.	Extensive oxid. on fract.; oxidized ground mass; clay on fract.
24	712'-722'	mnr. 60° mostly unconsol.	720			
25	722'-732'	unconsol.	730			
26	732'-742'	few 70° strong par. 90°	740		716.5'-732' Cinders, ash and scoria: unconsolidated, deep red oxid. color with no apparent grading. Rare plag. crystals (<math>< 1\%</math>). Sharp contact with overlying Basalts. 727'-732' color changes to grey-brown.	highly oxidized zone
27	742'-751'	strong parallel 90° few 80°	750			
28	751'-769'	few 30°, 40° ash is unconsol.	760		732'-762.5' Basaltic Andesite - mod porph; ^{med. grey} $\leq 5\%$ plag. phenos. (<math>< 2\text{mm}</math>); $\leq 2\%$ olivine phenos. (<math>< 1\text{mm}</math>), slightly vesic. Oxidation of matrix not as extensive as previous flows.	
29	769'-779'	mnr. - few 50°, 90°	770		749'-751' Flow Breccia - vesic; med. grey-red oxidiz.	
30	779'-789'	v. few 45°, 70°	780		751'-762.5' highly vesicular; most vesicles open ($\leq 5\text{cm}$); gndms. slightly oxidized; olivine phenos. increase to $\leq 5\%$	mnr. clay coating in ves.
31	789'-797'	mod 0°	790		762.5'-768 airfall tuff - poorly consolidated, white, v. fine grained ash and lapilli.	no alter.
32	797'-807'	mod 0°-30° in basalt rest unconsol.	800			
33	807'-816'	rand. 20° 50°, 90° 90° rest unconsol.	810		768-802' Basalt: sparsely porph. Oliv. <math>< 1\%</math> (<math>< 1\text{mm}</math>); v. fine gr.; dk. grey. 768-782' highly vesic. (<math>< 3\text{cm}</math>) vesic open; sharp contact with overlying ash. 782'-802' olivine decreases $\ll 1\%$ non-vesic. slightly oxid. to 802'	gndms, unoxid up to 782'; then only 768 - vesic. slightly oxid. to 802'
34	816'-826'	816'-821' strong 45° sev. paral. 40° mod 30° 821'-826' mod 30°	820		802'-803' basal flow breccia - red-brn. oxid.	
35	826'-836'	strong 0°-45° sev. paral. 40°	830		803-805' Cinders and ash: poorly to unconsolidated oxid. red to brn; vesicular lapilli.	highly oxid. on all surfaces
36	836'-845'	mod 0° - 15° paral.	840			
37		extreme 0° 45° - 45°	850		805'-810.5' Basaltic Andesite dk. grey, v. fine gr. sparsely porph. (<math>< 1\%</math> plag) 60°-70° flow angles apparent.	

Lithologic Description

Alteration

810.5' - 812' Ash and Cinders: loosely consolidated, oxidized lapilli and blocks of varying textures and lithology (Andesite?, Basalt?)

Extensive FeOx on cinders

812' - 862' andesite or Basaltic Andesite: dk grey, v. f. gr., sparsely porph. (< 1% plag. phenos); Apparent flow angles. 812-821' vesicular with open vesicle aligned an elongated parallel to flow angle. At 821' flow become non-vesic. and v. dk. grey; Occasional Xenoliths - 4-5 cm porph. vesic. basalt clasts with 15% plag. phenos. Flow angles decrease with depth: 812'-826' ~ 60°-75°; 826'-836' ~ 40°; 836'-845' ~ 15°; 845'-862' ~ 0° with extensive frac. and clay alter.; Alteration appears to follow flow lines - even on unbroken sections of core

Clay and FeOx on fract's
Bn: red FeOx(?) on frac - this is v. hard and porph. with v. fine dk. crystals

lt. blue rare rounded white zeolites(?) on frac. and vugs



Box #	Box interval	Fractures	Depth	Lithology	Lithologic Description	Alteration
37	845'-855'	strg. par. 0°-50°			862'-872.5' interbedded tuffs, ash and cinders: disrupted contact	highly oxid. throughout
38	855'-864'	Extreme 0°-50° to 862'	860		between basalts and pyroclastics; 863'-866' crystal, lithic tuff - lithics - dense grey basalt (< 3mm) plag < 1%; min. vesic. (< 1mm)	
39	864'-874'	mostly uncons. rand. min. frag. in consol. portion	870		866'-871' ash and cinders - unconsol.; deep orange color; vitric frags. (< 2mm) rare. 871'-872.5' crystal lithic vitric tuff - lithics 1mm - 1cm; crystals plag < 10% (< 3mm); vitric frags. (< 1%)	
40	874'-883'	"	880		ash matrix - deep orange color.	
41	883'-894'	"	890		872.5'-894' agglomerate; reddish purple color, vesic. basaltic bombs (< 10cm); coarsely porph.; plag. < 15% (< 3mm). 890'-892' highly vesic. with decrease in clasts; poorly consol. 892'-894' plag increase to ~ 20% (< 4mm) with varied blocks - some vesic, some dense, most dk. grey.	extensive alter. of grndmass FeOx / limon. on fract, lt. clay in vesic.
42	894'-903'	random-mod 80°-90°	900		894'-897' - unconsol. ash and cinders.	
43	903'-916'	mod 90° most of box broken	910		897'-905' - agglomerate; pink oxid. grndmass with few basaltic blocks	
44	916'-927'	mod 50°-70° w/ clay	920		905'-974' Basaltic Andesite: coarsely porph.; plag < 10% (< 4mm); Olivine < 10% (< 3mm) horiz; flow angles; Flow Banding - dk. to med. grey ~ 1cm thick; non vesic.; dense.	strng. clay on 50-70° fract; min. clay on 0°.
45	927'-936'	mod 50° par. 927-930 min 90°	930		936' - flow angles appear to be ~ 50° (parallel to frac.) occasional vesicular xenoliths.	
46	936'-945'	55°-65°-75° min. w/ clay mod 0°	940		964' - flow angles decreasing with banding ~ 0°-20°	
47	945'-955'	mod 0° + 50°	950		974'-1002' interbedded agglomerates and tuffs; 974'-978' disrupted contact between basalts and pyroclastics; flow angle ~ 80°; mod porph. 50% plag, 978'-1002' - poorly consol.; red oxid. ash matrix; < 1% plag. (< 1mm); vesic. basaltic blocks (< 5cm); 992'-994' dk. grey color with min. oxid. increase in vesicles (< 3mm). 995'-1002' crystal decrease (< 10%); vesicles increase in size (< 2cm), pink oxid. matrix again.	matrix is slightly altered
48	955'-964'	962-966 str. 90° highly alter. mod. 0-40°	960			
49	964'-974'	strg. 0° 968-976 mod par. 0°-70°-974	970			much clay / FeOx on fract; clay on flow lines gives appearance of fissility
50	974'-985'	uncons.	980			highly oxid. grndmass
51	985'-995'	uncons.	990			
52	995'-1005'	uncons.	1000			

Box #	Box interval	Fractures	Depth	Lithology	Lithologic Description	Alteration
52		unconsol.				
53	1005'-1015'	rand. mod 30°, 50°, 70°, 90°	1010		1002' - 1024' (?) Basaltic Andesite: v. f. gr. sparsely porph.; plag < 1% Flow banding varies 20°-60° with fract following flow angles; Slightly vesic. with vesic. aligning parallel to flow bands - elongated and open, 1002' - 1014' Flow Breccia - sil. vesic., red oxid. homogen. basalt. clasts (angular)	large vugs with FeOx limonite and lt. blue clay.
54	1015'-1024'	mod 0°, 30°, 50°, 90°	1020			mnr. clay on frac.
55	1024'-1034.5'	No sample	1030			
56	1034.5'-1047'	mostly unconsol. + broken	1040		1024' (?) - 1043' ash and cinders: poorly consol. strongly red oxid. with lapilli/unders - vesic. basalt (< 5mm) rare plag. crystals (<< 1%) 1041' - 1043' more consol. with increase in yellow clay(?) acting as cement.	
57	1047'-1056'	mod 0°, few 30°, 90°	1050			
58	1056'-1065'	mod 0°	1060		1043' - 1050' volcaniclastic - (volcanic sandstone?): uniform, rounded, med. size grains of Qtz, K-spar and volcanics; crude grading present. Cemented by limonite(?) and/or smectite. 1045' - 1050' grains become almost entirely dk. grey, subrounded basalt (< 2mm).	
59	1065'-1080'	mod 0° from 1066 - 1068	1070			
60	1080'-1090.5'	1078-10807 highly broken 1090-1091	1080			
61	1090.5'-1101'	0° 30° mod 90° highly alter.	1090		1050' - 1115' Basaltic Andesite or Basalt(?): porph.; plag. ~ 20% (< 5mm); oliv. ~ 1% (< 3mm); dk. to med. grey color; 1050' - 1057' highly vesic. - vesicles open (1mm-4mm), 1057' - 1071' non vesic. - much more dense (flow center), 1071' - 1073' - intra-flow breccia - loosely consol.; various sized basalt clasts, 1073' - 1088' highly vesic. again; at 1088' vesic. decrease and become elong. and aligned in flow direct. (~ 20°). 1103' - 1109' dense, non vesic. 1109' - 1115' med. grey to dk. grey vesic.	mnr. wht. clay in vesic. mnr. FeOx on fract on some frac, acicular white zeolites (?) (v. rare)
62	1101'-1110'	mod 90°, 0° few 75°	1110			1090' - 1091' and 1099' - 1101' highly altered vesicles. (FeOx, clay)
63	1110'-1126.5'	random frac + broken spec. in 1115' - 1130'	1120			
64	1126.5'-1138'	Top 4' broken rest - mnr. 90° mod 0° to 30°	1130			
65	1138'-1149.5'	mnr. 90° mod. 0° 1144-1149 broken up	1140		1115' - 1180' - Basaltic Andesite, compos. same as above unit; 1115' - 1130' Top Flow Breccia, oxid, vesic.; vesicles elongated vert. (< 6cm). 1132' - 1144' flow center dense med. grey. (non vesic.) 1144' - 1153' intra flow breccia.	FeOx/limonite in vesicles

Box #	Box interval	Fractures	Depth	Lithology	Lithologic Description	Alteration
66	1149.5' 1160'	1149-1153 broken up 1153-1160 mod. 0-30°	1160		1157' - vesic. increase - elongated and aligned at flow angle ~ 35° 1163' - 1176' - dense flow center non vesic. plag. decrease to ~ 10%; 0.11 v. f. << 10%.	alter. decrease at-flow center, little or no alter. on frac.
67	1160'- 1169'	mod 0°-30°	1170		1176' - 1180' basal flow breccia - purplish/red slightly oxid. vesicular basalt clasts	rare acircular zeolites(?) on vesicles
68	1169'- 1180'	few 40° mod. 90° 1176-1180 broken up	1180		1180' - 1249' - Basaltic Andesite(?) v. f. gr; plag, pyr(?) << 10% highly vesic. med grey to red grey with slightly oxid. gndmass; vesic. both open and filled. (< 4cm); v. f. grained.	oxid. of gndmass steadily increases.
69	1180'- 1190'	completely broken up	1190		1180' - 1194' - Top flow Breccia - highly red to tan oxid. with vesic. clasts of homog. comp. v. broken	Mnr. limonite on frags
70	1190'- 1199'	broken to 1194' mod. strg 0-30°	1200			
71	1199'- 1208'	mod. 0-30° 1204' - 1208' all rand. frac. angles	1200			
72	1208'- 1217'	entire box random. frac. 60°-30° mod. 30°	1210			
73	1217'- 1228'	1217-1224.5 broken up 1224.5-1225 mnr. 40°	1220		1217-1224 FLOW BRECCIA(?) - highly fract.; highly altered, slightly vesicular, brown-grey; poorly consolidated ash to block size basalt clasts	clay (brn. to tan/grey) on all surfaces
74	1228'- 1246'	1230'-1236' broken up 1236'-1240' mod. rand. 30°-20°	1230		1224'-1230 Flow center - slightly vesic.; med. grey, aphanitic v. fine grained. vesicles aligned in flow direct. ~ 30°, med. grey	lt. blue clay in vesic.
75	1240'- 1250'	mod. 70°-90° 1241'-1242' all else strg. par. 30°-40°	1240		1230' - 1236' Flow Breccia(?) - purplish-brn, highly frac. and broken; very vesic., aphanitic basalt clasts: vesicles filled with sand (volc. sand and/or drilling muds)	sl. calcitic clay (effervesces) in vesic. + frac.
76	1250'- 1260'	entire box highly frac. + broken up	1250		1236'-1248' Flow center - mod. vesic.; except 1241'-1242' which is dense and non vesic. 1242'-1248' vesic. aligned at ~ 30° (flow angle)	relatively unaltered except mnr. clay on frac.
77	1260'- 1269'	strg. rand. frac. 1260'-1263'	1260		1248'-1249' Basal Flow Breccia + greyish purple, mod. vesic, basalt. clasts - v. vesicular (< 3cm); broken up; grad. contact w/ below unit.	
78	1269'- 1278.5'	1269-1276 mod 0° 1276-1278.5 rand. strg frac	1270		1249' - 1263' FLOW BRECCIA(?) highly fract. + broken; 1249' - 1250' - red oxid., spars. porph, v. vesic.; 1250' - 1254' med. grey, non vesic.; v. broken up.	much clay highly alter. clay on all surf
79	1278.5'- 1289'		1280		1260' - 1263.5' - less altered, but still broken up. highly vesic.	lt. blue clay in vesic, limonite/FeOx extensive
80	1289'- 1299'	entire box broken at rand. angles	1290			



Lithologic description

Alteration

1263' - 1276' (lahar or volcaniclastic (?)) lt. brown ash matrix;
Clasts - ash to block size; med. to dk. grey, ^{mostly} non porph. Andesite/
Basalt; subangular to subrounded. Occasional porph clast (Plag ~ 20%)
mod. consolid; gradation, contact at top and base, Bedding and
grading present - indicate volcaniclastic - however wide range of grain
sizes without grading indicate lahar (Angular Basaltic block in
mud/ash matrix - matrix is of varying lithology as well.)

1276' - 1289' Andesite: med. grey; mod. porph. plag ~ 15% (< 2mm);
no oliv. visible

1276' - 1279' Top Flow Breccia - v. vesic.; red oxid.

1279' - 1283' Flow center - few vesic.; fewer frags

1283' - 1289' Basal Flow breccia - purple, red v. vesic. with
highly oxid grndms. plag decrease to < 10%.

much FeOx
on frags
in Breccia
little alter. in
Flow center.

1289' - 1290' Lapilli tuff / unconsol. ash: poorly consol.
heterolithic, lapilli - mostly subang. vesic. basalt/
Andesite (oxid). occasional dense non vesic. dk. grey
basalt clast and few plag. crystals. No bedding or
grading

1290' - 1291' andesite med. grey slightly vesic.; porph.; plag
~ 5%; gradat. contact with above lapilli tuff; slight
oxid. grndms.

1291' - 1297' Ash + Cinders: unconsol. ash to block size, heterolith;
vesic and highly oxid. no sorting or grading. occasional solid basaltic
blocks



# Box	Box Interval	Fractures	Depth	Lithology
71	1308-1308	no d/o faults in andesite all else broken	1300	
82	1306-1318	highly broken at random angles	1310	
83	1318-1327	mod to strq mod 65-75	1320	
84	1327-1336	mod, rand. 0-300 40-65	1330	
85	1336-1344	rand. mod in breccia 30-90 d/d. silt.	1340	
86	1344-1355	strq 0-30 1350-1351 broken	1350	
87	1355-1364	strq 70-90 1355-1358 rest - mod 0-30 200	1360	
88	1364-1375	rand. strq 1364-1370 rest - mod 0-30	1370	
89	1375-1384	mod 0-30 1375-1384 rest - mod 0-30	1380	
90	1384-1394	mod, parallel 60-70	1390	
91	1394-1403	1394-1398 broken 1395-1403 broken 40	1400	
92	1403-1412	1407-1410 par 400 mod 0-30 rest	1410	
93	1412-1420	1413-1416 broken up rest - mod 0-20	1420	
94	1420-1428	mod 0-30 sev. par, 400 mod, 900	1430	
95	1428-1439	mod, par, 300 and 60-70 sev. 10	1440	
96	1439-1448	1439-1441 ext. 900 fracs rest - mod 0-8	1450	

Lithologic Description

1297-1301.5' Andesite; med grey to brn; v. vesic. (1mm-1cm); porph. plag. < 5% (< 2mm); 1297-1298.5' Top flow breccia - red oxid, vesic. broken. 1301'-1301.5' basal Breccia

1301.5'-1303' Volcaniclastic (?); indurated, sorted, matrix block size, heterolithic, oxic, yellow brn ash matrix with lapilli to block size oxid, vesic. basalt. Grains appear to be mildly reworked; highly broken

1303'-1337' Andesite (?); 1303-1338 Flow breccia - highly broken with strq red oxid, v. vesic. (1mm-2cm); clast range from lapilli to block size. 1317-1326 - more conglid; still oxid and vesic; 1326-1328 brecciated and frac. 1328'-1335' Flow center - med, grey, unoxid; non vesic; coarsely porph. Plag ~ 20% (< 2mm); 1335'-1337' basal Flow Breccia vesic; mildly oxid; purplish red color.

1337'-1355' andesite; coars. porph. plag ~ 20% (< 2mm) med grey to dk. grey; 1337-1341' Top flow breccia - deep red oxid, v. vesic; (amm - 5cm); mod. porph. plag ~ 5% (< 1mm). 1341'-1354' Flow center - 1341'-1346 non vesic. 1346'-1350' med vesic, 1350'-1351 non vesic; 1351'-1354' v. vesic. 1354'-1355' basal Flow Breccia - oxid, non vesic, broken up

1355'-1417.5' Andesite; 1355'-1374' Top flow breccia red oxid, v. vesic; porph. plag ~ 10% (< 1mm) 1358-1362 broken and altered (< 1cm) 1374'-1384' Flow center - lt. to med. grey with mildly oxid, qndms; porph. plag. ~ 15% pyrox. < 10% 1374'-1377 vesic. (< 1cm) 1377'-1381' non vesic. s.l. qndms oxid. 1381'-1384' v. vesic. no oxid. qndms; 1384-1389' decrease in vesic, med to dcg ray 1389'-1398' intra-flow breccia; min. vesic. highly broken and altered 1398'-1410' Flow center - 1395'-1403 vesic. grey/brn, 1403'-1408' 1398'-1410' highly vesic, 1410-1412

non vesic. plag increase ~ 15% 1408'-1410' highly vesic, 1410-1412 intra-flow breccia broken up and fract.

Alteration

lt. clay in vesicles

much clay and FeOx on all surfaces

v. little alter. in flow center even on fracs,

limonite on fracts

clay, FeOx on fracs

min. zeol. in vesic.

Litho Description

1412' - 1413' Flowcenter non vesic. med grey with sl. oxid. gndms.
 1413' - 1416' intra-Flowbreccia a-grey/red to brn. non vesic, highly
 broken and frac; clasts - med vesic and oxid. 1416' - 1416a'
 Flowcenter - non vesic, j' mn. gndms oxid, j' med grey to
 dk grey - frags. appear to follow flow angles ~300-60°
 plag ~15% pyr < 1%. 1416a' - 1417.5' Basal Flowbreccia
 pink grey sil vesic, sl. oxid matrix with dk grey v,
 vesic. by clasts (< 4 cm)

most frags fresh with no alteration



Box #	Box Interval	Fractures	Depth	Lithology
97	14481-1457	sew. of mod. 70-90	1450	
98	14571-1469	1457-1466 mod. par. ss; few of rest broken	1460	
99	1461-1480	1461-1471.5 broken up; 1471-1480 mod. ss	1470	
100	1480-1490	box mostly broken up	1480	
101	1490-1500	broken to 1495 par. 400 (flow & 1495)	1490	
102	1500-1509	entire box frac. at 1501 & 15	1500	
103	1509-1520	1509-1514 broken + frac 1514-1520 mod. of 400	1510	
104	1520-1529	mod. 0°-30° med. par. 400	1530	
105	1529-1538	mod. 0°-30° mod. 90°	1540	
106	1538-1548	mod 0° mod 60°	1540	
107	1548-1557	mod 0° 1550-1557 mod. par. 500	1550	
108	1557-1567	0° mod. mod. par. 500-600	1560	
109	1567-1576	0°-10° mod. mod. 40°-60°	1570	
110	1576-1586	1576-1578 broken 1578-1586 mod. 0°-20° 600	1580	
111	1586-1597	mod. 0° mod. 40° broken in breccia	1590	
112			1600	

Lithologic Description

1471.5 - 1513.5 Andesite (?): 1471.5 - 1494.5 Top flow Breccia - 1471 - 1491 redox, v. vesic. (< 2mm); porph; plag ~ 10%. 1479 - 1494 Purple-grey to red-grey, mod. vesic. (< 1cm); clasts are med. grey vesic. And.; v. broken and frac.

1494.5 - 1495.5 - v. vesic.; med. grey; porph. plag ~ 5%; 1495.5 - 1501.5 non vesic. red-grey with mod. gndms. oxid. f. 1501.5 - 1509 Flow Breccia (?) purple-brn. to grey; v. vesic. and broken up, clasts are vesic. And.

1513.5 - 1539 Andesite: med to dk. grey; porph. plag (< 5%); (< 2mm) ppx, < 1% (< 1mm). 1513.5 - 1516 Top flow Breccia - red. oxid.; vesic. clasts. 1516 - 1524 med. to dk. reddish/grey; mod. vesic. (1mm-low) min. oxid. of gndms. 1524 - 1539 non vesic. med to dk. grey; no oxid; no alter - flow center. min. evid. of basal flow Breccia (< 4in.)

1539 - 1550 Andesite: highly vesic. (1mm-4mm); porph. plag < 5% sparsely

1539 - 1542 Top flow Breccia - red-grey oxid. gndms. ; fairly well consol.

1542 - 1550 Flow center - med. grey; only min. oxid. of gndms; mod. vesic.

1550 - 1565 Andesite: rtsso - 1551 Top flow Breccia - red vesic. broken porph. plag ~ 5%. 1551 - 1555 - med. grey, mod. vesic. (1mm - 2mm); unoxid. 1555 - 1564 min vesic. med. grey 1564 - 1565 Basal Flow Breccia - non vesic. dk. grey basalt-clasts.

Alteration

much clay in Flow Breccias

imprte on Fracs
day +
Fels on flow bands
(40° fracs also)

Fels on most surfaces

H. Fels +/- clay on Fracs

mod. to well developed zeolites in vesicles

Lithologic Descriptions

1565'-1576.5' Andesite; 1565'-1567' Top Flow Breccia - vesic. FeO₂ / limon in vesic, red grey oxid. j. 1567'-1576.5' med. grey/red. spars. porph. plag < 30%, mod. vesic. to mn. vesic. (limn-lmn) mn. oxid. of gndms.

1576.5' - 1587' Andesite; 1576.5' - 1578.5' Top Flow Breccia red oxid. j. vesic. j. broken up; 1578.5' - 1582' med. grey sparsely porph. plag. < 5% j. mn. red oxid. vesic. (limn-4mn). 1582' - 1587' same except non vesic. and no oxid. Mn. evidence of basal Flow Breccia (< 1').

1587' - 1597' Andesite; 1587' - 1588' Top Flow Breccia - red oxid. vesic, broken, 1588' - 1589' med. grey porph. plag < 5%, pyr. < 10% vesic. (< 1mn) j. mn. gndms oxid. 1589' - 1597' same except non vesic. and no oxid.

much clay on all surfaces in Flow Breccias

clay in Breccias no alteration in flow centers

Box #	Box interval	Fractures	Depth	Lithology
112	1597' - 1609'	Mod 40° few 5°-20°	1600	
113	1609' - 1619'	unconsol. and broken	1610	
114	1619' - 1629'	unconsol.	1620	
115	1629' - 1639'	unconsol.	1630	
116	1639' - 1649'	unconsol.	1640	
117	1649' - 1657.5'	unconsol.	1650	
118	1657' - 1667'	fract. + broken mod 5°	1660	
119	1667' - 1676'	mod. 60°-70° sev. broken sections	1670	
120	1676' - 1685.5'	mostly broken few 70° fracs	1680	
121	1685.5' - 1695'	1685'-1688' strg 50° 1688'-1695' mod. 0-20° many rand frags	1690	
122	1695' - 1704'	mod. 40°-45° many rand frags	1700	
123	1704' - 1713'	mod. 0° few 60°	1700	
124	1713' - 1723'	mod. 0° few 80°/90°	1720	
125	1723' - 1732'	mod. 0°-30° mod. 90° many rand.	1730	
126	1732' - 1742'	mostly random fracs	1740	
127	1742' - 1751'	mostly unconsol.	1750	

Lithologic Description

1597'-1607.5' Andesite: 1597'-1598' Top flow Breccia - red oxid, vesic, broken
 1598'-1606' - med. grey porph. plagg < 10% vesic, - vesic alligned par. to flow angle (~40°) (< 1mm); mm. oxid. grindms. 1607.5'
Basal Flow Breccia - grey-red vesic. with v. vesic Basalt/And. clasts.

1607.5' - 1659' Agglomerates/ash tunders / scoria; poorly consol.; vesic. red oxid. ash and cinders; clasts in agglom. are grey vesic. basalt. decrease in red color as you go deeper in unit.
1658' - 1659' Lapilli tuff - bright yellow ash matrix with vesic. lapilli (usually oxid. red)

1659'-1732' Basaltic Andesite: 1659'-1685.5' Top flow Breccia (2)
 med. grey/red - mainly broken; mostly unoxid; mod. vesic. (1mm-4mm); vesic. gradually decreases with depth. 1685.5' - 1732' - non. vesic. med. grey, sparsely porph. plagg < 10%, shv, << 1%
 1733' - Oliv. disappears with appearance of hornbl (??) (black, no cleavage, < 10% < 1mm) 1732' - 1733' Basal Flow Breccia - sil. vesic. grey/bn.; broken up:

1733' - 1734' crystal lithic tuff; brn. ash with vesic. lapilli; plagg. ~ 30% (< 1mm)

1734' - 1736' volcaniclastic (?); it. yellow ash/clay matrix with subrounded to subangular clasts of heterolithic comp. - usually vesic. dk. grey to red basalt.; crude grading

1736' - 1742' Lapilli tuff: 1736' - 1742' Tan ash with grey, vesic. porph. basaltic clasts; no grading; v. broken and fract. in portions

1742' - 1746' Agglomerate; red ash with grey and red vesic. basaltic clasts; poorly consol.

Alteration

mm. yellow clay on fracs, yellow clay alter. on fracs.

mm. yellow clay on fracs
 1659'-1660' (same as in lapilli tuff matrix)



Box #	Box interval	Fractures	Depth	Lithology
138	1751'-1753'	broken up	1750	
139	1760'-1763'	mod. 0.5 sec 1/8"	1760	
130	1768.5'-1778'	mod. 0.2-30" + unconsol. + unconsol.	1770	
131	1778'-1788'	mod. 0.2 mostly broken + unconsol.	1780	
132	1788'-1797'	mod. 0.2 mostly broken + unconsol.	1790	
133	1797'-1807'	mostly unconsol.	1800	
134	1807'-1815.5'	unconsol.	1810	
135	1815.5'-1825'	"	1820	
136	1825'-1834'	"	1830	
137	1834'-1847'	"	1840	
138	1847'-1859'	"	1850	
139	1859'-1868'	"	1860	
140	1868'-1878'	"	1870	
141	1878'-1887'	"	1880	
142	1887'-1897'	"	1890	
143			1900	

Lithologic Description

1746'-1780' Basaltic Andesite; 1746'-1755.5' Top Flow Breccia - med. grey non vesic. matrix with deep red oxid. vesic. clasts - porph. plag ~10% 1746'-1751' highly broken and oxid.; 1755.5'-1778' non vesic. med to dk. grey; porph. plag. ~10%; Oliv. < 10% (< 1mm). 1778'-1780' Basal Flow Breccia - grey non vesic. matrix with red oxid. vesic. clasts (clasts appear to be from underlying unit.)

1780'-1783' cinders and ash; unconsol. red ash and vesic. cinders with occasional grey, non vesic. porph. basaltic lapilli.

1783'-1789.5' Flow Breccia (?) med. grey, porph. plag ~16% with vesic. red oxid. clasts; mnr. flow banding; poorly consol.

1789.5'-1790.5' Crystal lithic tuff; Tan ash with coarse plag. (< 3mm) and red oxid. basaltic porph. lapilli; no bedding or grading

1790.5'-1795' Basalt: dk. grey spars. porph. plag = Oliv. < 10%. v. vesic. (< 1mm); gradat. contact above and below. v. fractured. in (1793'-1795' ± possible Basal Flow Breccia?)

1795'-1795.5' Crystal lithic tuff; same as interv. 1789.5'-1790.5'

1795.5'-1798' ash flow; wht. rhyolitic matrix with horiz. elong. Mod. welded frags of shards and ash; not div. in frag.

1798'-1800' lapilli tuff; yellow ash with vesic. dk grey to red basalt lapilli; no bedding or grading

1800'-1861' ash, scoria and agglomerates; yellow ash matrix with plag. (< 3mm); clasts - dk. grey, sl. vesic.; coarsely porph. Plag ~15% (< 4mm) basalt blocks. Poorly consol.

1861'-1863' Breccia Flow (?) (Basaltic Andes.) med. grey non. vesic. coarsely porph. plag. ~15% (< 4mm). with dk. grey vesic. porph. clasts.

Alteration

mnr. black waxy clay on some frags. Brn, FeOx +/- imon. on 70° frags. lt. brn. clay on all frac. The few vesic. present have v. mnr. boytridial siderite

FeOx / imonite on frags



1863'-1920' Cinders, ash and Agglomerates: Poorly consol. lt. yellow/Tan matrix with vesic., oxid clasts (lapilli to block size) as you go deep, amt. of red oxid. color increases (more cinders - until red ash and cinders dominate).
 ~1869' - 1878' yellow Tan agglom. with red oxid. clasts
 ~1878' - 1887' mostly ash and cinders.



Box #	Box interval	Fractures	Depth	Lithology
143	1851'-1901'	Unconsol.	1900	
144	1901'-1965'	"	1910	
145	1965'-1985'	"	1920	
146	1985'-1991'	mod 60°-90° 90°	1930	
147	1991'-1994'	strg. 65°-90°	1940	
148	1994'-1994'	mod 80°-90° strg	1950	
149	1994'-1993'	mod 60°-90°	1960	
150	1993'-1973'	Ext. 80°-90° Fluvio - 20°	1970	
151	1973'-1982'	mod 70°-90°	1980	
152	1982'-1991'	Ext. 80°-90°	1990	
153	1991'-2000'	strg. 0°-30° 70°-90° W. fractured	2000	
154	2000'-2009'	strg. pas. 70° Ext. 40° mod 0°	2010	
155	2009'-2019'	Ext. 80°-90° Ext. 0°-20° 2009-2011 W. fract.	2020	
156	2019'-2021'	Ext. 90° Ext. par. 70°	2030	
157	2021'-2037'	2029-2033 mod. par. 70° mod. par. 70°	2040	
158	2037'-2046'	mod. 10°-20°	2050	
159	2046'-2057'	mod 0°	2060	

Lithologic Description

1914.5' - grey ash begins to predominate
 1917-1920' - red ash and cinders again (unconsol.)

1920' - 2044' Andesite: 1920'-1925.5' Top flow Breccia - vesic. red oxid. grading to grey non vesic.; dk. grey vesic. clasts; matrix and clasts coarsely porph. plug ~ 20%.

1925.5' mod grey coarsely porph. plug ~ 20% (< 1cm); Oliv. << 1%? pyx < 1% (< 2mm); non vesic.

2040' - gradings begins to be oxid.; - ~ 4" of basal flow breccia

Alteration

mod. clay on frags.
 Mn²⁺, hard yellow clay + FeOx on frags.
 hard clay on all surfaces, in fract. area 2009.5-2011'

Box #	Box Interval	Fractures	Depth	Lithology
159	20571'-20601'	mod. 0°	20500	
160	20601'-20621'	few 80°-90°	20600	
161	20621'-20721'	mod. 0° 20721'-20771'	20700	
162	20771'-20821'	mod. 0° mod.-to strq. 90°	20800	
163	20821'-20951'	mod. 0°-55° 70° mod. 90°	*20900	
164	20951'-21051'	mod. 0°-30° 20971'-20991' Ext. 0°-90°	21000	
165	21051'-21141'	rand. 0°-40°	*21100	
166	21141'-21241'	rand. 0°-40° many frags. + broken zone	21200	
167	21241'-21341'	mod. 0°-20° few 48-50°	21300	
168	21341'-2141'	mod. 0°-20° 21341'-2141' Ext. 0°-80°	21400	
169	2141'-21531'	Ext. platy 0° few 90°	*21500	
170	21531'-21621'	Ext. 0°-80° strq 40°-80°	21600	
171	21621'-21711'	mod. 0° strq. pa v. 40°-60°	21700	
172	21711'-21811'	mod. 0° 21711'-21811' strq 90°	21800	
173	21811'-21901'	mod. 0° 21811'-21901' few 50° mod. 80°-90°	21900	
174	21901'-22001'	strq 80°-90° mod 0° few 50°	*22000	

Lithologic Description

2105.5' - 2131.5' Andesite: 2105.5' - 2131.5' flow Breccia -
 2105.5' - 2112.5' v. vesic. red brn with red vesic, clasts.
 2112.5' - 2131' mod. vesic.; oxid. red brn with grey sl. vesic, clasts
 Clasts are more rare; coarsely porph. plaq ~ 20% (< 1cm)
 2131' - 21341' - clast decrease in size, become dk. grey, non vesic.
 and v. rare.
 21341' - 21901' med to dk grey, coarsely porph. plaq. gradually
 decrease from 20% to ~ 3%; and decrease in size from
 < 1cm to < 4mm. with depth. non vesic. Pyr(?) = Oliv < 1%
 21901' - 22001' same except plaq decrease to < 1%

Alteration

mnr. FeOx on 0° fracs.
 lt. tan earthy
 clay on all fracs
 espec. 90°
 2141' - 21621'
 hard clay on 0° fracs

Box #	Box Interval	Fractures	Depth	Lithology
175	aa00'-aa09'	mod. 0° few 50°, 90°	aa00'	
176	aa09'-aa19'	strg. 90° mod. 70° few 0°	aa10'	
177	aa19'-aa25'	strg. 90° Ext. frac. in all direc.	aa20'	
178	aa25'-aa39'	strg. 90° mod. 0° ext. frac. zones	aa30'	
179	aa39'-aa51'	mostly broken few 0°-40°	aa40'	
180	aa51'-aa60'	strg. 0° few 30°	aa50'	
181	aa60'-aa72'	mod. 0° aa70'-aa71' broken up	aa60'	
182	aa72'-aa81'	v. broken up	aa70'	
183	aa81'-aa91'	mod. 0° aa83.5'-aa84' broken up	aa80'	
184	aa91'-aa01'	mod. 90° few 0°, 50°, 90°	aa90'	
185	aa01'-aa11'	mod. 60° aa01'-aa03' 230°-231' mod. 50°	aa00'	
186	aa11'-aa20'	mod. 70°-90° aa15'-aa19' broken up	aa10'	
187	aa20'-aa25'	strg. card, 70°, 90° mod. 0°	aa20'	
188	aa25'-aa38'	132°-233° Ext. card, mod. 50°	aa30'	
189	aa38'-aa47'	mod. 0° 231'-238' mod. 50° Ext. 90°	aa40'	
190	aa47'-aa50'	mod. 0° Ext. 90°	aa50'	

Lithologic Description

aa08-aa21.5 plagioclase, decrease to < 10% ; flow banding apparent ; dk, grey to med. grey bands ~ 3 mm thick

aa27.5'-aa31.5 Basal Flow Breccia - med grey non vesic. ; non porph. with sl. vesic. porph. med. grey clasts ; highly frac. and broken

aa31.5'-aa69 Andesite ; aa31.5'-aa52 Top Flow Breccia - mod. to v. vesic. ; sl. red oxid. ; vesic. horiz. elong. ; aa38-aa39 broken into small pieces. aa39'-aa52 oxid. and vesic. decrease in matrix ; (clasts are still vesic.) porph. plagioclase < 1% ; tan-grey color

aa52'-aa69 med. grey ; sparsely porph. plagioclase < 1% ; rare vesicles.

aa69'-aa83.5' Andesite ; aa69'-aa74' Breccia Flow (?) broken up ; vesic. brn/red with much tan clay. coarsely porph. plagioclase ~ 20% (< 4mm). aa74'-aa83.5' med. grey with mn. grndms. oxid. ; coarsely porph. plagioclase ~ 20% ; pyr. < 1% (< 2mm) sl. vesic.

aa83.5'-aa15' Andesite (?) Basaltic Andesite (?) ; aa83'-aa89' Top Flow Breccia - red-grey v. vesic. dk. broken aa89'-aa92' mod. vesic. ; dk. to med. grey ; coarsely porph. plagioclase ~ 25% (< 1cm) ; pyr. ~ 1% oliv. (?) < 1%. aa92'-aa13 non vesic. med grey ; aa13'-aa15' sl. vesic. with mn. oxid in vesic.

2315'-2368 Basaltic Andesite (?) ; 2315'-2314' Top Flow Breccia - grey-red, mn. grndms. oxid. ; mod. vesic. ; v. broken + frac. porph. plagioclase ~ 25% 2319'-2329 med. grey, porph. plagioclase ~ 25% pyr. < 1% 2329'-2368 - med. grey non vesic. porph. plagioclase ~ 20% pyr. ~ 1% oliv. (?) ~ 1%

Alteration

clay on all surfaces in flow Breccia

aa38'-aa39' much limonite on all surfaces

tan clay on all weathered surfaces

4. yellow clay on faces. (smectite +/- yellow clay) limonite, Feox filling vesicles

Box #	Box interval	Fractures	Depth	Lithology	Lithologic Description	Alteration
191	2357'-2368'	Ext. 90°	2360'		2368'-2400' Andesite; 2368'-2370' Top flow Breccia - red oxid. v. vesic. (1mm - 4mm); 2370'-2380' red v. vesic. grading to red-brn. mod. vesic. grading to red grey, sl. vesic. sparsely porph. Plag ~ 19% (prx < 19%) 2380'-2400' mod. grey non vesic. ; occasional lg. vesicle, (< 4mm).	Alteration
192	2378'	mod 0°	2380'		2400'-2413' Andesite Flow Breccia; mod. porph. plag ~ 10% (< 3mm); pyr. < 1% (< 1mm) 2400'-2403' - v. broken, red grey oxid. mod. vesic.	Clay on all surfaces
193	2378'-2387.5'	mod 0°	2380'		2403'-2408' same except grey brn, less oxid and less vesic.	
194	2397'-2397'	Ext. 0°	2390'		2408'-2413' more consolidated; no oxid; med. grey; non vesic.; clasts are dk. grey; v. vesic. (< 10mm)	
195	2408'	mod 0°	2400'		2413'-2422' Volcaniclastic; org. to red to greyish red, poorly consol.; crude grading; matrix mostly ash size part; clasts are lapilli size v. vesic.	
196	2420'	mostly frag. and broken	2420'		2422'-2449' Andesite; 2422'-2429' Top flow Breccia - med. grey, mod. vesic.; mn. FeOx; clasts - mod. vesic; dk. grey, various sizes.	
197	2420'	Ext 90°	2430'		2429'-2449' non-vesic.; med. grey aphanitic. At 2441' gndms becomes mn. oxid.	
198	2432'-2442'	Ext. 90° to 2436' then mod 0° 40°	2440'		2449'-2456' Ash flow; 2449'-2451' densely welded Blackotrophyre.	
199	2442'-2451'	Strg 0°-30° FeOx 70°-90° mod. 90°	2450'		2451' mod. welded vitrophyre with tan matrix; 2453' poorly welded pink matrix; welding decreases with depth.	
200	2451'-2462.5'	strg. at Van don angles	2460'		2456'-2496.5' Andesite or Basaltic Andesite (?); 2456'-2471.5' Flow Breccia - dk. to med. grey; v. vesic. (< 6mm); v. broken 2471.5'-2480' mod. vesic dk. grey aphanitic 2480'-2494' Non vesic. ; much more fract.	
201	2462.5'-2472'	mod. 0° sev. broken zones	2470'		2494'-2496.5' Basal Flow Breccia - med. grey with mn. red org. oxid. ; sl. vesic (espec. clasts), mod. broken	
202	2472'-2482'	mod 0°-30° @ 2480' strg 90°	2480'			strg. orange FeOx coating in vesic, mn. limon. in vesic.
203	2482'-2491'	2482'-2486' Ext. 90° 2486'-2491' Ext. 0°	2490'			Ext. FeOx on 90° frac s
204	2491'-2501'	Strg 0° mod 100° sev. broken zones	2500'			



Box #	Box interval	Fractures	Depth	Lithology	Description	Alteration
205	2501-2514	mod 0° mostly broken up	2510		2496.5' - 2498.5' Lapilli Tuff: red poorly consol. oxid. ash grading into greenish yellow matrix with heterolithic lapilli (mostly dk. grey vesic. Basaltic Andesite).	
206	2514-2523	mod. 0°	2520		2498.5' - 2503' Scored: med. grey vesic. unconsolid.	
207	2523-2533	mod. 0° sev. broken zones	2530		2503' - 2530.5' Lithic Lapilli Tuff: pink-orig. ash with heterolithic lapilli; pumice frags present but no flame.	
208	2533-2543	mod. 0°-30° 2542-2544 Ext 90°	2540		2530.5' - 2545.5' Basaltic Andesite; 2530.5' - 2531' Topflow Breccia.	
209	2543-2552	mod 85° sev. brkn zone	2550		2531' - 2536' med. to dk. grey, sparsely porph.; oliv. < 10% plag. < 10% mod. vesic. (1mm - 2mm). 2536' - 2545.5' non vesic. 2545 - 2545.5' Basal Flow Breccia - med grey-red, vesic.	
210	2552-2561	mod. 0°-40° few 90° 2557-2561 brkn. up	2560		2545.5' - 2557' Basaltic Andesite; 2545.5' - 2546' Top Flow Breccia - red/grey oxid. vesic. brkn up. 2546' - 2548' vesic. med. grey; sparsely porph. Oliv. < 10% (< 1mm); plag. < 10% (< 1mm); 2548' - 2553' mnr. vesic. 2553' - 2555' non vesic. 2555' - 2557' basal Flow Breccia	
211	2561-2578	rand. frags. in all dir.	2570		2557' - 2601.5' Basaltic Andesite; 2557' - 2563' Topflow Breccia? - v. brkn. mod. vesic.; oxid. red; aphanitic. 2563' - 2593' - more consol. but still frag. med. grey to red grey, aphanitic. 2593' - 2601' Basal Flow Breccia? - v. brkn., med. grey with grndms. oxid.; v. lg. vesic. (< 4cm); aphanitic.	
212	2578-2581	"	2580		2601.5' - 2603.5' Agglomerates; orig. ash matrix with dk. grey mod. vesic. basaltic blocks	
213	2581-2595	"	2590		2603.5' - 2604.5' Tuff: tan ash with crude grading	
214	2595-2605	"	2600		2604.5' - 2605' Agglomerate; same as 2601.5' - 2603.5'	
215	2605-2618	mostly brkn. few 40° few 10°	2610			
216	2618-2627	v. brkn	2620			
217	2627-2636	rand. brkn few 0° 165°	2630			
218	2636-2647	strq. 90° mod 0°-30°	2640			
219	2647-2657	mod 0°-30°	2650			

Lithologic Description

2605'-2636' Basaltic Andesite (?); 2605'-2616' Flow Breccia - mostly unconsol. v. brkn. 2605'-2608.5' scoria - med. grey uncons. grading into grey bn. more solid with vesic, grey clasts; mn. grndms oxid. 2608.5'-2616' unconsol, brkn + altered, 2616'-2619' more consolid. (possible flow center); - mod. vesic; med. grey; mn. grndms. oxid. 2619'-2624' Flow Breccia (?) - v. brkn, much bn. - Tan clay on all surfaces. 2624'-2625' consolid.; mod. vesic; med. grey ophanitic (flow center). 2625'-2628' Flow Breccia (?) - brkn; and alter. no oxid. of grndms. mn. to mod. vesic, med grey 2628'-2633' mod. consol., fewer vesic. mn. grndms. oxid, 2633'-2636' Flow Breccia (?) - v. brkn, non vesic.; med. grey, mn. grndms, oxid.

2636' - 2656.5' Basaltic Andesite: 2636' - 2641' Top flow Breccia - brkn, org. - red oxid, mod. vesic, 2641' - 2653.5' - med. grey aphanitic; rare vesic. 2653.5' - 2656.5' Basal Flow Breccia (?) - brkn. red-purple; mod. vesic. (4mm - 4cm); with much clay on surfaces

Alteration

wht. clay coating on scoria; strng. org. red FeOx 2616'-2616' Ext. FeOx in brkn, zns.

strg. FeOx on fracs
turquoise blue clay and limonite on fracs. In 2644'-2647' grndms chloritized, FeOx in vesic. in Basal Flow Breccia



Box #	Box Interval	Fractures	Depth	Lithology	Lithologic Description	Alteration
219	2656.5' - 2657.5'	Ext. fault 53°	2656.5'		2656.5' - 2713' Basaltic Andesite; 2656.5' - 2681' - Top flow Breccia - 2656.5' - 2657' mod. brkn; mod. vesic. (lmm - 2um); deep red oxid. matrix with dk. grey vesic. Basaltic clasts.	0° fracs - yellow clay
220	2685' - 2686'	mod. 66°; most v. rand. frac.	2685'		2657' - 2683' v. frac. 2683' - 2687' red oxid; mod. vesic. aphanitic consolid. abvt-abvt v. brkn and oxid. 2687' - 2679' grey-red, more consolid. decrease in vesic. clasts getting increasingly rare. 2679' - 2681' - med. grey, no oxid, rare vesic. except in rare clasts.	
221	2671' - 2677'	mod. 0°-25°; many v. frac. zones.	2670'		2681' - 2691' non vesic. aphanitic; med. grey flow center 2691' - 2700' intra-Breccia - med. grey-red; mnr. gndms oxid. rare clasts - dk. grey mod. vesic blocks of same comp. as breccia. 2700' - 2710' non-vesic med. grey flow center. 2710' - 2713' Basal Flow Breccia - brkn up, purple-grey; mod. vesic (lmm - lcn)	
222	2671' - 2686.5'	mod. 0°-40°	2650'			
223	2685.5' - 2685.5'	Strq, 65°-75°	2650'			
224	2685.5' - 2687'	mod. 66°	2700'			
225	2707' - 2710'	mod. 0°	2710'			
226	2716' - 2735'	mod. 0°	2720'		2713' - 2741.5' Basaltic Andesite; 2713' - 2717.5' Top flow Breccia - oxid. red v. vesic. v. brkn. 2717.5' - 2721' aphanitic, mod. vesic. (lmm - lcn); grey-red, oxid gndms. 2721' - 2725.5' few vesic. med. grey; mnr. oxid. 2725.5' - 2734' grey unoxid non vesic. 2734' - 2741.5' Basal Flow Breccia - purple-grey v. vesic, v. brkn.	mnr. ilmon on fracs. tan clay on fracs. 2730-2731' Ext. purple clay on 90° fracs
227	2734' - 2746'	entire box broken up	2730'			
228	2746' - 2757.5'	v. frac. w/ mod 40° 90°	2730'		2741.5' - 2812.5' Basaltic Andesite; 2741.5' - 2757.5' Top flow breccia - red - grey v. brkn. and vesic.; clasts are not distinguishable 2757.5' - 2759.5' v. brkn and vesic. but unoxid. 2759.5' - 2764' med. grey unoxid mod. vesic, well consolidated. (dk. clayitic ?) (10/16 play)	Strq, yellow clay coating fracs, 2763' - cont. clay on 90° fracs
230	2757.5' - 2767'	2757' - 2759' brkn. up 2763' - 2767' mnr. ext. 80°	2760'		2764' - 2777.5' same except non vesic. 2777.5' - 2781' intra flow breccia brkn.; med. grey; mod. vesic. 2781' - 2792' mnr. vesic, med. grey; dk. clayitic with the 2792' - 2793' intra-flow breccia 2793' - 2801' same as 2781' - 2792'.	
231	2771' - 2776'	mnr. 80°	*2770'			
232	2776' - 2787'	60° 90°	2780'			
233	2787' - 2796'	mod. 0°	2790'			
234	2796' - 2809'	ext. 90°	2800'			

Box #	Box interval	Fractures	Depth	Lithology
231	2885'-2905'	Mod. 0°	2885	
235	2814.5'-2814.5'	mod. 0°-20° 2814.5'-2814.5'	2810	
236	2804.5'-2804.5'	mod. 0°-30° SEV. brkn. sections	2800	
237	2824.5'-2835'	2824.5'-2824.5' 2835'-2835'	2830	
238	2835'-2844'	mod. 0°-30° Ext. 90°	2840	
239	2844'-2853'	v. brkn. @ rand. angles	2850	
240	2853'-2863'	"	2860	
241	2863'-2873'	Ext. 90° mod. 0°	2870	
242	2873'-2882'	Ext. 90° mod. 0°	2880	
243	2882'-2891'	Ext. 90° mod. 40°	2890	
244	2891'-2900'	Ext. 90° Strg. 0°-20° mod. 45°-50°	2900	
245	2900'-2909'	v. frac. div. in rand. div.	2910	
246	2909'-2918'	Fract. and brkn.	2920	
247	2918'-2921'	mod. 45° mod. 90° mod. 0°-30°	2930	
248	2921'-2931'	rand. frac. in all dir.	2930	
249	2931'-2947'	brkn. and unconsol.	2940	
250			2950	

Lithologic Description

2801' - 2805' intra-flow breccia-brkn. mod. vesic. med grey-purple
 2805'-2811.5' mod. grey nonvesic. 2811.5' - 2812.5' Basal flow Breccia -
 mod. vesic. i purple-grey with mn. gndms. oxid.

2812.5'-2823' Basaltic Andesite; 2812.5'-2815.5' Top flow breccia - grey-
 red v. brkn. i v. vesic. i med. grey vesic. clasts. 2815.5'-2817' sl.
 vesic. dk. grey wrox. aphanitic. 2817'-2821' same except non vesic.
 2821'-2823' Basal Flow breccia-mod. vesic. v. brkn. med. grey

2823'-2846' Basaltic Andesite; 2823'-2829' Top flow Breccia - v. brkn.
 med. grey, med. vesic. 2829'-2846' med. grey, aphanitic, non vesic.

2846'-2860' Lahar; brn. mud/ash matrix; heterolithic clasts -
 red-grey to dk. grey non-vesic and vesic. of varying size; no sorting
 or grading

2860'-2899' Andesite(?); 2860.5'-2865' Top flow breccia - pink oxid,
 to brn. grey with v. vesic. clasts;brkn. opion porph. 2865'-2869.5'
 gm. grey, vesic. -horiz. elong. (<3mm), some are amygdules
 filled with calcite in wnt. fibrous, radiating well developed crst.
 sparsely porph. pyr (<190) with Euhedral crst. (<2mm);
 Mn. chloritiz. of gndms. 2869.5'-2883' same, except
 non-vesic. i mn. calcite veinlets. 2883'-2891' med. grey
 non vesic without chloritiz. 2891'-2898' same except
 gndms to mod. chloritized again. 2898'-2899' Basal
 flow breccia - dk. grey vesic. blocks in tan-red matrix.

2899'-2909' Agglomerate(?); orng. ash with lapilli to block size
 clasts grading to a tan-brn. matrix. clasts are v. vesic. dk.
 grey, porph. homogeneous; crude grading; poorly consolidated.

Alteration

Tan-brn clay on most
 surfaces

limon. on fracs and
 in vesic in flow breccia

light-tan clay on all
 surfaces in flow breccia

Tan-pink clay filling vesic
 in clasts in flow breccia
 on 90° fracs blue-grn.
 lt. blue clays (mn.
 efferes. - calcitic?)

Ext. calcite on fracs
 and in vesic. in flow
 center. Black MnO₂?
 on fracs; 2882'-2883'-
 and blue-green clay
 on fracs,

Lithologic Description

Alteration

2909' - 2928.5' Basaltic Andesite; 2909' - 2918' Top flow breccia - v. brkn.; tan ash matrix with dk. grey mod. vesic clasts.
2918' - 2921.5' - med. grey, sl. vesic.; mod. brkn.; sparsely porph. pyr. < 1%
2921.5' - 2928.5' same except only mn. vesic.; oliv. < 10%.

Ext. tan clay on flow breccia

2928.5' - 2930' Lahar(?): Tan mud/ash matrix with dk. grey sl. vesic. clasts of various sizes; no grading or bedding; brkn. up

H. blue clay coating on clasts

2930' - 2931' Flow Breccia (Basaltic): dk. grey; coarsely porph. plag ~ 85%; oliv. < 10%; mn vesic. matrix with vesic. med. grey clasts of various sizes

2931' - 2932' volcaniclastic(?): dk. grey to brn. subang. to sub-round grains (< 2mm usually); well consolidated, but v. fract.; grains - basaltic compos. Tow fract. to det, if grading present

2932' - 2935' agglomerate; poorly consolidated, tan-yellow ash with red scoriaceous blocks (non porph.) v. brkn.

2935' - 3007.5' Andesite(?) or Basalt(?); 2935' - 2948' Top flow breccia - v. fract. 2935' - 2940' med. grey to brn. with grey brn. clay snail surface; mn. to mod. vesic grey clasts
 2940' - 2946' red oxid med. vesic. blocks with much yellow clay.
 2946' - 2948' - still oxid but less vesic and no yellow clay.

Box #	Box Interval	Fractures	Depth	Lithology	Lithology Description	Alteration
250	2947-2956	mod. 0°-20° mnr. 90°	2950		2948'-3002' dk. grey non-vesic.; aphanitic with mod. strq. chlorit. gndms.	v. little clay or other alter. except mnr. Calcite & MnOx on fracs (and chloritiz. of gndms)
251	2956'-2964'	mod. 0°-20°	2960			
252	2966'-2975'	mod. 0°-20°	2970			
253	2975'-2985'	mod. 0° few 80°	2980			
254	2985'-2994'	mod. 0°-20°	2990			
255	2994'-3004'	mod. to strq. 0°-20° few 80°-90°	3000		3002'-3007.5' Basal flow breccia - pinkish grey, v. vesic., v. brkn; dk. grey vesic. clasts,	
256	3004'-3013'	brkn. up	3010			
257	3013'-3022'	strq. brkn. up	3020		3007.5'-3020' Agglomerate; 3007.5'-3013' red-orig ash matrix with red oxid. scoriaceous blocks, consolidated, but brkn. 3013'-3020' yellow-tan ash matrix with red to med. grey vesic. non-porph. clasts; poorly consolidated,	much limonite 3004'-3013' on all surfaces
258	3022'-3031'	mod. 0° mod. 75°-90° mod. 45°	3030			
259	3031'-3040'	mod. 0°-20° mod. 90°	3040		3020'-3112' Basalt(?); 3020'-3023' Flow breccia - dk. grey non-vesic. with dk. grey - brn. mod. vesic. clasts (<4um),	strq. Calcite on fracs; FeOx on fracs.
260	3040'-3050'	strq. 0° mod. 90°	3050		3023'-3103' non vesic.; dk. gm-grey aphanitic; chlorit. of gndms.	
261	3050'-3060'	mod. to strq. 90°	3060			
262	3060'-3069'	mod. 0°-20°	3060		3042' vesic. increase - < 2mm - horiz. and aligned parallel. Decrease in chloritiz. of gndms. (med. grey color)	clay coats; small botryoidal siderite in vesic.; calcite amygdulites. mnr. Calcite on fracs orig to blk. waxy clasts on fracs
263	3069'-3080'	mod. 45°-50°	3070			
264	3080'-3088'	mod. 0° 3084'-3086' strq. 90°	3080		3050' - dk. gm. grey with chloritized gndms; non-vesic. (again)	
265	3088'-3097'	mod. 0°-30° few 90°	3090			
266			3100			

Box #	Box interval	Fractures	Depth	Lithology	Lithologic Description	Alteration
266	3047'-3107'	Ext. 0° strg. 16°-90°	3100		3103'-3112' Basal Flow Breccia - dk. grey to purplish grey, non-vesic., non porph. matrix with various sized clasts - some vesic.; some non vesic.; porph. 25% plagi (4mm); <10% oliv. (< 2mm)	Calcite veinlets strg. chlorite and Ht. blue-grn. clay on fracs; wt clay in vesic. at 3103'-ext.
267	3107'-3116'	Ext. 80°-90° strg. 50°-60°	3110			
268	3116'-3125'	mod 0°-20°	3120			
269	3125'-3135'	mod 0°; fwd brkn zones	3130			
270	3135'-3144'	mod 0°	3140		3112'-3140' Ash Flow; 3112'-3123' med. to dk. grey ash matrix with heterolithic clasts - dk. grey; mod vesic. and med. grey non-vesic. of various sizes. Matrix and clasts porph. - plagi 5% Bor sorting, no grading 3123'-3127 Tan ash matrix with change in clasts - dk. grey mod. vesic. (as before); red oxid non-porph; volcanic lithic frags; pumice frags; still no sorting or grading. 3127'-3140' mod. diatritified zone - glass shards along horz. and pari. v. l. m to 6cm size; welded.	
271	3144'-3155'	v. brkn and frac.	3150			
272	3155'-3163'		3160			
273	3163'-3173'	brkn + frac. in sand, in dir.	3170		3146'-3147' lehar(?) med. grey matrix; v. clast rich; no sorting or grading; clasts heterolithic of all sizes; ang. to subang.	
274	3173'-3183.5'	v. brkn Ext. 60°-90°	3180			
275	3183.5'-3192'	v. brkn + unconsol.	3190		3147'-3160' Agglomerate: purple-grey ash matrix with vesic. and non vesic. dk. grey basaltic blocks; no sort. or grading. Clasts are of similar composition	
276	3192'-3201'	3192'-3195' brkn. v. brkn 3198'-Ext. 70°	3200			
277	3201'-3211'	3201'-3205' strg. of mod 30° 3205'-3209' Ext. sand.	3210			
278	3211'-3221'	Ext. Fracs in all dir. Oe. postm.	3220		3160'-3175.5' Flow Breccia; dk. purplish-grey v. brkn. and frac.; mostly non vesic.; non porph. Clasts range from dk. to med. grey and are of similar comp.	
279	3221'-3231'	mod. 0°-30° strg. 90°	3230		3175.5'-3183.5' Basalt: 3175.5'-3177 Top flow Breccia - red oxid. with med. grey to red mod. to strg. vesic. clasts; v. brkn. 3177'-3181 dk. grey; non vesic.; non porph. ; fwd banding gives mottled appearance. Mn. chlorite. of gndms. mod. brkn. 3181'-3183.5' Basal flow breccia - purplish grey non vesic. with red oxid. v. vesic. clasts (< 1cm. v. brkn. and frac.	
280	3231'-3241'	mod. 0°-20° mostly frac. + uncons.	3240			
281	3241'-3250'	rand. frac. in all dir.	3250			



Lithologic Description

3228.5' - 3228.5' Basaltic (And?) 3183.5' - 3199' Top flow breccia (?) - Tan matrix with mostly red oxid. vesic. clasts and few grey non vesic clasts; most clasts < 3cm, few block size. 3193' - 3198' - purple red more consolidated, smaller clasts, less closely spaced, rare plagiocrystals in matrix. 3198' - 3199' grey unoxid.; still has small (< 1cm) vesic. dk grey clasts; mottled appearance.

3199' - 3205' med. grey, non vesic. aphanitic; with mottled appearance from flow banding 3209' - 3213' intra flow breccia - tectonically brecciated and reoriented with yellow clay (sulter?); minor chlorite 3213' - 3218' frac. and brkn. pieces of med. grey mottled flow with same yellow clay (?) that cemented breccia, non vesic. 3218' - 3219' v. brkn, mod vesic. with limonite on all surfaces 3219' - 3228.5' Basal flow breccia (?) in v. frac. and brkn.; dk grey to purplish grey, non vesic. porph. plagi. ~15% pyr ~10% (pyr appears altered); v. ilg. clasts (< 10cm) of various composition - some dk. grey vesic. with similar compos. of above flow, some appear to be flow breccias with clasts of its own. (from underlying unit?)

3228.5' - 3231' lapillituff/agglomerate: lapilli to block size mod vesic., dk grey porph. (plagi.) in pink-orig. ash matrix.

3231' - 3235' Flow Breccia (Basaltic): brn.-grey, v. altered, porph. plagi ~10% oliv (?) ~10% v. frac.

3235' - 3237.5' DIKE (?): dk. grey to blk, vitreous "waxy" appearance; mildly tectonically brecciated and reoriented - Glassy margin in 3237.5' - 3244' Basaltic Andesite? med. to dk. grey; porph. phenocrysts (< 5mm) chloritized grains, non vesic

3244' - 3248' DIKE: dk grey to blk. waxy, vitreous, non vesic.

3248' - 3251' Agglomerate: red-orig. oxid matrix with various clasts, all usually basaltic, but varying in size, texture, vesicles.

Alteration

clay on all surfaces in flow breccia
FeOx +/- limonite on 80°-90° fracs.
qm. - blue clay on fracs.

chlorite on fracs

th. blue clay on fracs.

mmr. Qtz and calcite veinlets
much H+ blue clay on all surfaces

Box #	Box interval	Fractures	Depth	Lithology
282	3260'-3265'	Ext. rand, frags.	3259'	
283	3265'-3271'	Ext. rand frags.	3270'	
284	3271'-3281'	"	3280'	
285	3281'-3292'	"	3290'	
286	3292'-3293'	"	3290'	
287	3293'-3302'	Ext. 0° " platy "	3310'	
288	3302'-3320'	V. brkn, (not as Ext. as before)	3320'	
289	3320'-3329'	V. brkn, and frac.	3330'	
290	3329'-3338'	"	3340'	
291	3338'-3342.5'	mod. 0°-20° sev. frac. zones	3340'	
292	3342.5'-3357'	mod. to strg, 0°-40°	3350'	
293	3357'-3365'	mod. 0°-20° 3365'-3365' Tand. frac.	3360'	
294	3365'-3374'	rand. frac, v. brkn.	3370'	
295	3374'-3390'	"	3380'	
296	3390'-3400'	"	3390'	

Lithologic Description

3261'-3269' Basaltic Andesite (?) (no top flow breccia evid.) 3250'-3254' pink grey to dk. grey; mod. vesic. with mmr. yellow clay in vesic. vesic. elong. horiz.; occasional non porph "waxy" zones (< 1' dikes?) 3254'-3268' dk. grey v. vesic. with ext. yellow clay on all surfaces and flow lines (gives platy appearance), v. brkn and frags, 3268'-3269' Basal Flow Breccia

3269'-3314' Basaltic Andesite (?) 3269'-3272.5' Top flow Breccia - v. brkn. and frac; red oxid.; v. vesic., much yellow clay. 3272.5'-3281' red oxid. to dk grey with ext. yellow clay; v. vesic. with mottled appearance. Ext. fract = 3281'-3312' med. grey, non porph., non vesic.; mortarized grains with red and yellow oxid. following flow lines; mottled appearance. 3312'-3314' Basal Flow Breccia - dk. grey with blk to dk grey clasts (appear to be from underlying unit) no oxid.

3314'-3320' Basaltic Andesite (?) 3314'-3315' dk. grey, porph plag ~10%; oliv. < 10% 3315'-3320' dk. grey, non porph, v. altered and broken; non vesic.

3320'-3322' Dike?; Blk, non porph., non vesic. "waxy" luster; glassy marginoli.

3322'-3378' Basalt (?) or Basaltic Andesite (?) 3322'-3336' Flow breccia - v. brkn; med grey with dk. grey clasts; no oxid.; sl. vesic.

3336'-3357' dk. to med. grey; sl. vesic.; (vesic. < 2mm); porph. 3357'-3363' med. porph. plag ~10% (< 3mm) and becomes lighter grey. 3363'-3364' non porph. v. frags med. grey, non vesic.; mottled; with sm. vesic. clasts (< 3mm)

3364'-3378.5' v. dk. grey to blk with waxy texture; porph. plag ~5% (< 1mm) v. broken up.

3378.5'-3418' Flow Breccia (?) Red grey with sl. oxid. grains. pale clasts; (blk to dk. grey) non vesic. v. frac; and brkn

Alteration

zeolites in vesic.

Red FeOx on dike material

mmr. limonite black waxy clay? on few frags

green clay on faces

zeolites and mmr Calcite in vesic.

strg. FeOx on 0° frags



Box #	Box interval	Fractures	Depth	Lithology
306	3395'-3412'	rand in all direct.	3410	
307	3412'-3425'	"	3420	
308	3425'-3441'	"	3430	
309	3441'-3453'	Ext. rand frags.	3450	
300	3453'-3463.5'	mostly frag. in rand. dir. Ext. 80°-90°	3460	
301	3463.5'-3473'	rand. frag. in all dir.	3470	
302	3473'-3491.5'	"	3480	
303	3491.5'-3511'	"	3500	
304	3511'-3532.5'	"	3520	
305	3532.5'-3542'	Ext. 0°-20° strq. 90°	3540	
306	3542'-3551'	Ext. 0°-20° rand. frags.	3550	

Lithologic Description

3412' - 3438' Basalt - (too broken to distinguish if overlying flow breccia is in same flow)
 3412' - 3421.5' dk, grey non vesic, mottled appear. porph. plag. ~30% v. frac. + brkn.
 3421.5' - 3438' Flow Breccia (?) dk grey - blk, vesic. v. brkn.
 3438' - 3509' Basalt + 3438' - 3444.5' Top flow breccia - pinkish red matrix, v. brkn. sl. vesic; med. grey elongated clasts; porph. plag. ~50%, 3444.5' - 3508' dk. grey v. f. gr. porph. plag. <50%, oliv <<1% non vesic; v. frac. and brkn.
 3508' - 3509' Basal flow breccia
 3509' - 3510' Lithic tuff or org. ash matrix with dk. grey mod. vesic. clasts
 3510' - 3721' Basalt (?); 3510' - 3512' Top flow Breccia - brkn. red oxid. mod vesic. (<amm), aphanitic. 3512' - 3526' - dk. grey; sl vesic. spars. porph. plag. ~30%; v. frac. 3526' - 3532' med. grey mod vesic. - vesic. are amygdaloidal with wht. clay and zeolites
 3532' - 3721' med. grey non vesic. wht. clay on flow lines causing platy look

Alteration

Ext. FeOx on flow lines (~40°) giving platy appearance.
 yellow clay / FeOx on flow lines (~20°)
 much H. blue clay
 much FeOx in flow breccia
 much FeOx 3512' - 3530' Botryoidal siderite in vesic; wht. clay on frags
 possible MnOx?
 increase in MnOx on frags.

Box #	Box interval	Fractures	Depth	Lithology	Lithologic Description	Alterations
307	3551'- 3580'	Ext. 0°-30° strg. 90°	3550			
308	3560'- 3561'	Ext. 0° 90° v. fractcs.	3560			Ext. chloride on 90° fracs.
309	3561'- 3599'	"	3570			
310	3579'- 3589'	" sl. less fracture markings	3580			
311	3589'- 3598.5'	strg. 0° lead 98°; 287°-298° v. brkn	3590			
312	3598.5'- 3608.3'	mod. to strg. 0°, 90°	3600		3578' consid. less fractured; still mod. grey non vesic. - plaq. decrease to << 10%. on fracs, there is hard lt. green to oliv. grn crystals	90° fracs have calcite coating.
313	3608.3'- 3617'	mod. to strg. 0° 90° lead 65°	3610			
314	3617'- 3627'	mod. 0° lead 65°-75°	3620			hard wht. thick (~2mm) coating on 30° fracs.
315	3627'- 3637'	strg 36° mod. 90°	3630			90° fracs have earthy brn - org. coating
316	3637'- 3647'	strg. 60° strg. 80°-90°	3640			
317	3647'- 3654'	Ext. 90° sev. frac. zones	3650			
318	3654'- 3661'	strg. 0° mod. 90°	3660			
319	3661'- 3679'	v. frac. Ext. 90°	3670			
320	3679'- 3681.5'	Ext. 6° strg. 80°-90°	3680			
321	3681.5'- 3699'	Ext. 0° strg. 80°-90°	3690			Tan-yellow clay on 90° fracs - sl. grndms skid.

Box #	Box interval	Fractures	Depth	Lithology
322	3694'-37085'	Ext: 90° 0° v. brkn. up	3760	
323	37085'-3717'	rand. Ext. Fracs	3710	
324	3717'-3726'	"	3720	
325	3726'-3735'	rand. Fracs Ext. 90°	3730	
326	3735'-3743'	Ext. 70°-90° Strg. 0°-30°	3740	
327	3743'-3751'	rand. Fracs in all dirs.	3750	
328	3751'-3761'	Strg. 90° and rand. Fracs	3760	
329	3761'-37705'	mod. 50° 0° Sev. v. brkn. Zones	3770	
330	37705'-3781'	mod. 0°-30°	3780	
331	3781'-3791'	mod. 0° to 4784' thru rand. Fracs.	3790	
332	3791'-3800'	mod. 0°	3800	
333	3800'-3809'	mod 0° to 3805' v. brkn	3805	
334	3809'-3815'	mod. 50°-70° few 90°	3810	
335	3815'-3828'	3819'-3823 v. brkn mod. 0°	3820	
336	3828'-38315'	mod. 0° mod. 40°-70° 3825-3832 v. brkn	3830	
337	38315'-38465'	3837'-3839 brkn v. brkn mod. 0° rest	3840	
338			3850	

Lithologic Description

3725-3729' dk. grey with plug ~ 3770 (< 2mm)

3729'-3742.5' ash flow: 3729'-3735' mostly tan-bm. ash with few clasts - dk grey med. to strg. vesic + lt grey non vesic basalt; plug ~ 5% (< 4mm) 3735'-3741' increase in amt. of clasts; crude bedding, evid. flow structures; 3741'-3742.5' same except with dk. grey elongated horiz. laminae and large plug Kis (< 7mm) 3742.5'-3742.5' v. brkn - v. gassy, densely welded

3742.5'-3791' basalt: 3742.5'-3751' top flow breccia - red-grey grading to purple grey; v. brkn, "mottled"; non vesic, matrix with large v. vesic. red oxid clasts: 3751'-3762.5' v. f. gr. non porph. rare vesic. dk. grey; vesic are amygdaloidal with calcite. 3762.5'-3766' flow breccia - med. grey matrix with med. grey vesic. and non vesic. clasts, 3766'-3774' med. grey, mod. vesic., non porph. v. brkn, well developed calcite crystals in vesic. 3774'-3778' same except dk. grey 3778'-3784' same except non vesic, therefore a decrease in calcite 3784'-3791' basal flow breccia; 3784'-3787' v. brkn. and vesic. 3787'-3791' more consol. but still vesic. med to dk grey, rare clasts.

3791'-3805' Laheer flow Breccia (?); well consol. med. grey non vesic, non porph. ash matrix with dk. grey non to mod. vesic. clasts ranging from lapilli to block size; no grading or sorting.

Alterations

lt. blue clay and limonite in vesic. and on fracs. Calcite filling vesicles and vugs; mm. zeolites in vesicles. Aragonite on fracs.



Lithologic Description

3805' - 3839' Basalt; 3805' - 3809' Flow Breccia - med. grey, non-
vesic. matrix with dk. grey vesic. clasts. 3809' - 3835.5' med. grey non-
vesic.

3835.5' - 3839' Basal Flow Breccia (?) med. grey; tectonically
brecciated and reamended, still vitric. (even after reamending)

3839' - 3842.5' Lahar? grey-brn. mud/ash matrix with heterolith.
clasts - lapilli to block size; red grey to med. grey vesic and non vesic,
no grading or sorting; occasional vitric pieces (obsidian); clasts
are ang. to subang.; both porph and non porph.

3842.5' - 3877' Andesite(?) or Basalt(?); 3842.5' - 3848.5' Flow
breccia - grey matrix with v. minor oxid. of grains; vesic. clasts
which are oxid.; porph and of various sizes; some of brecciation
appears to be tectonic

much th. blue clay and
limonite in flow breccia



Box #	Box interval	Fractures	Depth	Lithology	Lithologic Description	Alterations
336	3848.5' - 3855'	mod. frac. in all dir.	3856'		3848.5' - 3876' dk. grey mod. vesic. - vesic. amygduloidal with Calcite and lt. blue clay. Sparsely porph. plug < 10% ; pyrox < 10%.	Calcite in vesic., mn, botryoidal-siderite
339	3858.5' - 3865'	Ext. 0°-90° strg 65°	3860'		3855' - same calcite as thin coat on frags	
340	3868.5' - 3874'		3870'		3876' - 3877' basal flow breccia - dk. grey with grey vesic clasts	much lt. blue clay on all surfaces
341	3874' - 3874'	3874' - 3874'	3880'		3877' - 3924.5' Andesite; 3877' - 3888.5' top flow breccia - red-grey oxid. grading to mod. brn. - grey to med. grey; clasts are vesic. oxid. and dk grey; Calcite filling vesic. ; sparsely porph ; plug ~ 30%	@ 3893 much FeOx on frags.
342	3883' - 3893'	mod. 5° - 65° and 65° SW, V. zones	3890'		3888.5' - 3924.5' - med. grey, rare vesic. ; sparsely porph. ; pyrox (?) < 30% ; plug < 10% ; v. frac. and brkn.	@ 3898.5' - gndms becomes chloritized.
343	3893' - 3902'	strg, 90° mod. to strg 50°	3900'		@ 3911' - mildly tetronically brecciated and reemanated ; phonos decrease pyr < 10% ; plug < 10%	strg FeOx on 90° frags
344	3902' - 3911'	strg, 90° mod. 0°-25°	3910'		3924.5' - 3924.5' basal flow breccia - med. grey with vesic oxid clasts, v. brkn and crumbly	Ext. blue clay on all surfaces + in vesic, amygdules with calcite
345	3911' - 3924'	strg to ext. 90°	3920'		3924.5' - 3939' Andesite or Basalt (?); 3925' - 3930' top flow Breccia - grey red oxid mildly vesic. matrix with v. red, v. vesic. clasts	FeO, blue clay on frags and in vesic., calcite amygdules, siderite in vesic.
346	3924' - 3930'	mod. 0°-30° strg 90° brkn 3924.5' - 3930'	3930'		3930' - 3932' red oxid v. vesic. 3932' - 3939' brn. - grey to dk. grey ; non vesic. ; ~ 1" of basal flow breccia	
347	3930' - 3939'	mod. 0°-40°	3940'		3939' - 3969' An Andesite or Basalt (?); 3939' - 3946' top flow Breccia (?) red oxid. matrix g.s. to mod vesic. ; pyrox clasts ; mod. brkn 3946' - 3967' dk. grey ; sl. vesic. ; no phonos visible ; mildly chloritized gndms, 3967' - 3969' Basal flow breccia (?) - v. brkn, med grey	
348	3939' - 3948'	mod. 0°-20° zones	3950'		3969' - 3984' Andesite or Basalt (?) ; 3969' - 3973' top flow breccia - grey brn. matrix with red oxid. v. vesic. lg. clasts (< 10cm), mostly brkn. 3973' - 3980' red oxid. mod. vesic. ; mod. brkn. 3980' - 3984' dk. grey with mildly oxid. gndms, few vesic. - amygduloidal - clay and calcite.	blue + wht. clay in frags. and in vesic
349	3948' - 3958'	mod. 0°-25° FeOx 50°	3960'			
350	3958' - 3967'	mod. 0°-30°	3960'			
351	3967' - 3976'	3967' - 3971' v. brkn 3971' - 3976' mod. 0°-30°	3970'			
352	3976' - 3985'	mod. 0°-30°	3980'			
353	3985' - 3994'	v. brkn to mod. 0°-30°	3990'			
354	3994' - 4002'	mod. 0°-50° Ext. 90° SW brkn zones	4000'			

50 SHEETS 22-141
100 SHEETS 22-142
200 SHEETS 22-144





	<p>Lithologic Description</p> <p>39841-40026(?) T.O. Andesite or Basalt(?) 39841-39894' Top flows breccia (?) ± v. brkn, red oxid., mod. to v. vesic. 39894-40026(?) non to sh. vesic (<5m) red grey to dk. grey non porph. mildly oxid. gndms.</p>	<p>Alteration</p> <p>blue clay in vesic, Ext. botryoidal clay siderite in vesic. coated Ext. FeOx on 90° faces in interval 39451-39991 vesic. filled with Calcite</p>
--	--	---