

SECTION 5: THIN SECTIONS



142-864A-1M-01 (0–10 cm) OBSERVER: BR WHERE SAMPLED: Unit 1
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Microcrystalline.
 TEXTURE: Spherulitic (variolitic) to microlitic (no glass).

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	1%	<1%	0.2–1 mm		Euhedral, prismatic.	Some slight oscillatory zoning. Skeletal overgrowths common. Occasional glomerocrysts.
GROUNDMASS						
Plagioclase	1%–3%	1%–3%	<0.2 mm		Skeletal, acicular bundles.	Often in sheaf-like, radial, or bow-tie microlites.
Olivine	Tr	Tr	<0.05 mm		Skeletal, equant.	
Titanomagnetite	<1%	<1%	<0.15 mm		Anhedral, skeletal, equant.	Within and between sheaf bundles of acicular microlitic plagioclase.

VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	2%	Dispersed.	<0.2 mm	None.	Round.

COMMENTS: Flow banding shown by spherulitic and microlitic bundles. Microlites show preferred orientation parallel to banding. Sheaf spherule texture common in spherulitic zone. Rock is fresh.

142-864A-1M-02 (0–35 cm) OBSERVER: HAR WHERE SAMPLED: Unit 1
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Glassy to microcrystalline.
 TEXTURE: Glassy with spherulites.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1%	<1%	0.07–0.3 mm		Euhedral prismatic.	Both zoned and unzoned crystals. Few glomerocrysts.
GROUNDMASS						
Plagioclase	Trace	Trace	<0.1 mm		Skeletal to acicular.	
Olivine	Trace	Trace	<0.1 mm		Skeletal and acicular.	

VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	<1%	Dispersed.	<0.05 mm	None.	Round.

COMMENTS: Many of the olivine and plagioclase microlites lie at the center of spherules. Spherules are often coalesced in linear zones one spherule wide implying crystallization associated with flow shear. Some smaller crystals of same material in sheaf-like bundles with some preferred orientation parallel to linear spherule zones. Some vesicle walls are decorated with sporadic tiny sulfide globules 1 to 2 microns in diameter.

142-864A-1M-02 (35–55 cm) OBSERVER: HAR WHERE SAMPLED: Unit 1
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Microcrystalline.
 TEXTURE: Spherulitic to microlitic, no glass.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1%	<1%	0.08–1.2 mm		Euhedral, prismatic.	Both zoned and unzoned crystals. Some glomerocrysts.
GROUNDMASS						
Plagioclase	5%–10%	5%–10%	<0.6 mm		Acicular, skeletal.	Some preferred orientaton of microlites. Microlites form bow-tie and radial clusters. Some sheaf-like bundles.
Olivine	Trace	Trace	<0.08 mm		Skeletal, acicular, equant.	Some hopper crystals.
Titanomagnetite	<1%	<1%	<0.01 mm		Anhedral, skeletal.	

VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	<1%	Dispersed.	<.05 mm	None.	Round.

COMMENTS: Rock is fresh.

142-864A-1M-02 (100–150 cm)
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Microcrystalline.
 TEXTURE: Spherulitic to microlitic, no glass.

OBSERVER: HAR

WHERE SAMPLED: Unit 1

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1%	<1%	0.1–1.4 mm		Euhedral prismatic.	One glomerocryst.
GROUNDMASS						
Plagioclase	2%–4%	2%–4%	<1.4 mm		Acicular.	Sheaf-like bundles of acicular microlites.
Olivine	<1%	<1%	<0.05 mm		Skeletal, equant.	
Titanomagnetite	1%	1%	<0.008 mm		Anhedral skeletal.	

VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	<1%	Dispersed.	<0.05 mm	None.	Round.

COMMENTS: Some linear zones of spherules. Some preferred orientation of microlites parallel to linear spherule zones. Spherules are turbid and felty in appearance. Rock is fresh.

142-864A-1M-03 (0–35 cm)
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Glassy to microcrystalline.
 TEXTURE: Glassy with spherulites.

OBSERVER: BRO

WHERE SAMPLED: Unit 1

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1%	<1%	0.1–0.6 mm		Euhedral, prismatic.	Twinned, unzoned.
GROUNDMASS						
Plagioclase	Trace	Trace	<0.2 mm		Acicular.	Sheaf-like bundles.
Olivine	Trace	Trace	<0.05 mm		Acicular.	Small sheafs often at the core of spherules.

VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	<1%	Dispersed.	<0.04 mm	None.	Round.

COMMENTS: Coalesced spherules form flow banding, one spherule wide. Glass contains 10%–15% to 80% spherules and crystallites. Rock is fresh.

142-864A-1M-03 (55–85 cm)
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Microcrystalline.
 TEXTURE: Spherulitic (variolitic), no glass.

OBSERVER: BRO

WHERE SAMPLED: Unit 1

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1%	<1%	0.1–1.0 mm		Euhedral to prismatic.	Slight zonation in some crystals.
GROUNDMASS						
Plagioclase	1%	1%	<1.0 mm		Acicular.	Some sheaf-like bundles.
Olivine	<1%	<1%	<0.2 mm		Acicular to skeletal, equant.	Sheaf-like bundles.
Titanomagnetite	1%	1%	<0.001 mm		Anhedral, skeletal.	Interstitial to silicate minerals.

VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	1%–10%	Located in zones.	<1.4 mm	None.	Irregular to rounded.

COMMENTS: Rock is fresh.

142-864A-1M-03 (55–85 cm) OBSERVER: BRO WHERE SAMPLED: Unit 1
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Microcrystalline.
 TEXTURE: Spherulitic (variolitic), no glass.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1%	<1%	0.2–0.7 mm		Euhedral, prismatic.	Twinned, unzoned. Skeletal overgrowths common.
GROUNDMASS						
Plagioclase	<1%	<1%	<0.2 mm		Acicular.	Often in sheaf-like bundles.
Olivine	Trace	Trace	<0.05 mm		Acicular to subhedral prismatic.	Hopper crystals common.
Titanomagnetite	1%	1%	<0.004 mm		Anhedral, skeletal.	
VESICLES/CAVITIES						
Vesicles	PERCENT 1%–2%	LOCATION Throughout	SIZE (mm) 0.01–0.4 mm	FILLING None.	SHAPE Round to irregular.	

COMMENTS: Sheaf spherules are very well developed. Spherules are coalesced and make up great majority of the rock. Two generations of vesicles. First is rounded to irregular (may represent coalescing of vesicles), 0.1–0.4 mm in size. Second is smaller, 0.001–0.10 mm in size, and round. Rock is fresh.

142-864A-1M-03 (100–150 cm) OBSERVER: BRO WHERE SAMPLED: Unit 1
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Fine-grained.
 TEXTURE: Intergranular, no glass.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	Trace	Trace	0.25–1.0 mm		Euhedral, prismatic.	Twinned, unzoned.
GROUNDMASS						
Plagioclase	30%–40%	30%–40%	<0.8 mm		Acicular.	Some hopper crystals. Some in radial intergrowths.
Clinopyroxene	5%–15%	5%–15%	<0.2 mm		Anhedral to plagioclase.	Minor amount of sub-ophitic subhedral, equant or clinopyroxene grown around acicular plumose.
Olivine	<10%	<10%	<0.05 mm		Anhedral, equant.	
Titanomagnetite	<1%	<1%	<0.05 mm		Anhedral, skeletal.	Interstitial to silicate minerals.
VESICLES/CAVITIES						
Vesicles	PERCENT None.	LOCATION	SIZE (mm)	FILLING	SHAPE	

COMMENTS: Approaching sub-ophitic texture. Slight preferred orientation of plagioclase microlites. Rest of groundmass is mesostasis. Rock is fresh.

SITE 864

142-864A-1M-04 (0-9 cm)
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Fine-grained.
 TEXTURE: Subophitic, intergranular, intersertal.

OBSERVER: NIU

WHERE SAMPLED: Unit 1

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	Trace	Trace	0.3-1.0		Tabular to rounded.	Only a few grains, some of which show resorbed features.
GROUNDMASS						
Plagioclase	40	40	<1.5		Acicular to swallow-tailed.	Quench growth features: skeletal and elongate.
Clinopyroxene	40	40	<1.0		Subhedral, anhedral, crystals.	Subophitic growth around plagioclase acicular to prismatic.
Olivine	2	2	<0.1		Subhedral to anhedral.	
Magnetite	1-2	1-2	<0.01		Skeletal, anhedral, (mesostasis) patches.	Occurs within glassy or spherulitic to euhedral.
Mesostasis	15	15				

VESICLES/CAVITIES/VOIDS	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
	6	Random.	2	None.	Irregular.	Leached vesicles?

COMMENTS: The rock is fresh and is crystalline. Except for a few grains which are phenocrysts, all plagioclase crystals are of quench morphology (skeletal, acicular, and swallow-tailed), though the grain/length can be as much as 1.5 mm (length). There are some sulfide globules, occurring within glassy or spherulitic (mesostasis) patches (size <0.006 mm) with variable shapes, from irregular to rounded. They seem to form by exsolution of sulfide-liquids from silicate melts. Based on the reflectivity, characteristic color, and isotropic nature, they are likely pyrite. This report is based on two thin section descriptions. One section (T.S. #29) was heated to 500 degrees C for magnetic properties studies. The mesostasis of this section has a pinkish tint reflecting the presence of hematite. Marked as Piece #1.

142-864A-1M-04 (9-20 cm)
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Microcrystalline
 TEXTURE: Spherulitic to microlitic.

OBSERVER: NIU

WHERE SAMPLED: Unit 1

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1.0	<1.0	0.2-0.8		Euhedral, tabular.	
GROUNDMASS						
Plagioclase	15	15	<0.7		Skeletal and acicular.	Microlites show extreme elongation or swallow-tailed shapes due to rapid growth (quench).
Clinopyroxene	5	5	<0.15		Skeletal, anhedral.	Sector, sweep zoning.
Olivine	<1	<1	<0.1		Equant, anhedral to euhedral.	
Magnetite	1-2	1-2	<0.05		Skeletal.	
Sulfide Minerals	Trace	Trace	<0.005		Irregular to round.	

VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	<1.0	Random.	0.1-0.15	None.	Irregular to round.	

COMMENTS: One blue, granular crystal (about 0.08 mm) has high relief, low birefringence, occurs within a void, and it is unidentified but is probably grinding powder(?). The sulfide drops are probably pyrite. The rock is fresh. Marked as Piece #1.

142-864A-1M-04 (20–30 cm) OBSERVER: NIU WHERE SAMPLED: Unit 1
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Mostly glassy.
 TEXTURE: Spherulitic to glassy.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1.0	<1.0	up to 1		Euhedral, tabular, wedge-like.	Twinned, clear interior (no inclusions).
GROUNDMASS						
Plagioclase	<1.0	<1.0	<0.5 long		Skeletal, and acicular.	Plagioclase microlites show extreme elongation (rarely > 5–6 micron wide) due to rapid growth (quench).
Magnetite	Trace	Trace	<0.001		Skeletal.	Dispersed around spherule rims.
VESICLES/CAVITIES						
Voids	1–2	Between spherules.	0.01–0.5	None.	Circular to irregular.	

COMMENTS: One perfect, euhedral plagioclase grain (0.1–0.3 mm) shows excellent zoning. Large, coalesced, irregular vesicules up to 0.5 mm. Smaller vesicles are rare in glassy areas, most common in coarser spherulitic ground mass. The rock is very fresh. Marked as Piece #1.

142-864A-1M-05 (0–100 cm) OBSERVER: BCH WHERE SAMPLED: Unit 1
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Glass to microcrystalline.
 TEXTURE: Glassy to spherulitic.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1	<1	0.2–0.6		Euhedral.	Mainly tabular.
GROUNDMASS						
Plagioclase	<3	<3	<0.2		Acicular.	Concentrated in a spherulitic band running through middle of section.
Sulfide globule	Trace	Trace	<0.008		Round.	Occur freely in glass.
VESICLES/CAVITIES						
Vesicles	<1	Irregular.	0.02–0.8	None.	Round to irregular.	

COMMENTS: Rock is fresh, showing glass sandwiching a band of spherulitic rock. Marked as Piece #1.

142-864A-1M-05 (0–100 cm) OBSERVER: NIU WHERE SAMPLED: Unit 1
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Glass to microcrystalline.
 TEXTURE: Glassy to spherulitic.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1	<1	<0.8		Euhedral, tabular.	Glomerophyric clusters, some grains show zoning.
GROUNDMASS						
Plagioclase	8	8	<0.8		Acicular, skeletal.	Some skeletal grains show swallow-tailed forms.
Magnetite	Trace	Trace	<0.005		Skeletal.	Sparsely distributed.
Sulfide globules	Trace	Trace	<0.005		Irregular or round.	Likely pyrite, crystallized from exsolved sulfide liquid from silicate melt.
VESICLES/CAVITIES						
Vesicles	<1	Random.	<0.08	None.	Irregular to round.	

COMMENTS: The rock is fresh. Textural zoning is characterized by glassy margin and more spherulitic texture in the interior. Almost all the spherules have incipient microlites as cores. Marked as Piece 2.

142-864A-1M-05 (100–118 cm)
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Fine-grained.
 TEXTURE: Intergranular.

OBSERVER: BCH

WHERE SAMPLED: Unit 1

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1	<1	0.3–0.4		Subhedral to euhedral, blocky.	Scalloped, rounded edges look resorbed.
GROUNDMASS						
Plagioclase	50–55	50–55	<0.3		Acicular to elongate laths.	Radial intergrowths dominate the groundmass.
Clinopyroxene	30–35	30–35	<0.3		Anhedral to subhedral.	Some are subophitic around plagioclase lath.
Olivine	Trace	Trace	<0.05		Anhedral to subhedral.	
Magnetite	1–2	1–2	<0.12		Skeletal.	
Mesostasis	15–20	15–20				
VESICLES/CAVITIES						
Vesicles	2	LOCATION Clustering	SIZE (mm) 0.6–0.8	FILLING None.	SHAPE Irregular.	

COMMENTS: The rock is fresh and shows minor subophitic texture. In the groundmass small sulfide globules (<0.012 mm) of light yellowish color (probably pyrite) occur. Marked as Piece 2B.

142-864A-1M-05 (100–118 cm)
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Fine-grained.
 TEXTURE: Intergranular.

OBSERVER: BCH

WHERE SAMPLED: Unit 1

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	1	1	0.2–1		Tabular.	Glomerophytic or single crystals, zoning in some grains.
GROUNDMASS						
Plagioclase	25–30	25–30	<1		Skeletal to acicular.	
Clinopyroxene	10–15	10–15	<0.2		Anhedral to subhedral or skeletal.	Often in sheaf-like and plumose masses.
Olivine	1	1	<0.5 long		Anhedral to subhedral, elongate, skeletal.	
Magnetite	1	1	<0.1		Skeletal.	
Sulfide globules	Trace	Trace	<0.006		Round.	
VESICLES/CAVITIES						
Vesicles	1	LOCATION Irregular	SIZE (mm) 0.02–0.3	FILLING None.	SHAPE Round to irregular.	

COMMENTS: Matrix is mainly composed of spherulites and minor glassy patches. Rock is fresh. Marked as Piece 2A.

142-864A-1M-05 (100–118 cm)
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Microcrystalline.
 TEXTURE: Spherulitic.

OBSERVER: BCH

WHERE SAMPLED: Unit 1

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1	<1	0.2–0.4		Subhedral to euhedral.	
GROUNDMASS						
Plagioclase	<5	<5	<0.1		Subhedral to skeletal.	
Clinopyroxene	<5	<5	<0.1		Skeletal.	Sector, sweep zoning.
Magnetite	1	1	<0.01		Rounded.	Concentrated between spherulites.
Olivine	Trace	Trace	<0.05		Skeletal.	
VESICLES/CAVITIES						
Vesicles	1	Dispersed.	SIZE (mm) <1.5	FILLING None.	SHAPE Round to irregular.	

COMMENTS: A kink-banded layer of microcrystalline grains crosses through the thin section. The "upper" part of the thin section shows minor portion of dark-brown cryptocrystalline mesostasis. The rock is fresh. Marked as Piece 1.

142-864A-1M-06 (0–75 cm)
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Microcrystalline
 TEXTURE: Glassy to spherulitic (variolitic).

OBSERVER: HEK

WHERE SAMPLED: Unit 1

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	1%	1%	0.1–0.6 mm		Euhedral, tabular.	Glomerocrysts common. Most crystals have quench overgrowths. Slight compositional zonation.
GROUNDMASS						
Plagioclase	5%	5%	<0.2 mm		Acicular.	Microlites in sheaf, radial, or bow-tie bundles.
Olivine	<1%	<1%	<0.03 mm		Acicular to skeletal.	Often in small aggregates.
Titanomagnetite	<1%	<1%	<0.005 mm		Anhedral	Sometimes concentrated along margins of vesicles.
VESICLES/CAVITIES						
Vesicles	1%	Localized	SIZE (mm) 0.002–0.4 mm	FILLING None.	SHAPE Round to irregular.	

COMMENTS: Chilled glassy margin grades into spherule-rich interior with no glass. Sample is foliated with individual foliation surfaces defined by the concentration of spherules. Two generations of vesicles with large, irregular ones (0.1–0.4 mm) and small, round ones (0.02–0.03 mm). Rock is fresh.

SITE 864

142-864A-1M-06 (75-140 cm)
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Glass to microcrystalline.
 TEXTURE: Glassy to spherulitic.

OBSERVER: BCH

WHERE SAMPLED: Unit 1

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1	<1	0.2-0.6		Euhedral.	
Clinopyroxene	Trace	Trace	0.4		Euhedral.	Only one grain.
GROUNDMASS						
Plagioclase	Trace	Trace	<0.1		Acicular.	Very minor.

VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1-4	Patchy.	0.02-1.5	None.	Round to irregular.	

COMMENTS: Rock is fresh and shows coalesced sheaf and radial spherules make up bulk of the rock. Marked as Piece 1.

142-864A-1M-06 (75-140 cm)
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Microcrystalline to fine-grained
 TEXTURE: Microlitic to intergranular

OBSERVER: BCH

WHERE SAMPLED: Unit 1

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1	<1	0.3-0.8		Euhedral, tabular.	Scalloped, rounded edges look resorbed.
GROUNDMASS						
Plagioclase	30	30	<0.8		Subhedral to skeletal.	Mainly acicular.
Clinopyroxene	10	10	<0.2		Subhedral to skeletal, plumose.	Sector, sweep zoning.
Olivine	2	2	<0.1		Subhedral.	

VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	3-4	Dispersed.	0.02-0.4	None.	Round to irregular.	

COMMENTS: About 20% of the rock is dark, cryptocrystalline mesostasis. The rock is fresh. Marked as Piece 2.

142-864A-3Z-01 (0-6 cm) OBSERVER: BRO WHERE SAMPLED: Unit 2
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Microcrystalline.
 TEXTURE: Spherulitic (Variolitic) to Microlitic. No glass.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1%	<1%	<1.2 mm		Euhedral, prismatic.	Slight quench overgrowths.
GROUNDMASS						
Plagioclase	10%	10%	<0.4 mm		Acicular, skeletal.	Largely individual microlites. Some sheaf and bow-tie bundles.
Clinopyroxene	5%	5%	<0.2 mm		Anhedral, plumose.	Intergrown with plagioclase.
Olivine	3%	3%	<0.1 mm		Anhedral, skeletal.	Individual crystals.
Titanomagnetite	2%	2%	<0.06 mm		Anhedral, skeletal.	
Sulfide globules	Trace	Trace	<0.005 mm		Round.	Pale yellow. Uniaxial. Pyrite (?).

VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	Trace	Dispersed.	<0.2 mm	None.	Round.	

COMMENTS: Crystal clot of intergrown clinopyroxene and plagioclase. Large (up to 6 mm in length), euhedral, poikilitic clinopyroxene crystal intergrown with plagioclase. Individual plagioclase crystals are euhedral, prismatic (up to 3 mm in length), and sometimes skeletal. Rock is fresh.

142-864A-4Z-01 (Piece 3, 9-15 cm) OBSERVER: BRO WHERE SAMPLED: Unit 2
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Medium-grained.
 TEXTURE: Microlitic to intersertal to intergranular. No glass.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	1%-2%	1%-2%	0.4-3.0 mm		Euhedral, elongated to prismatic.	Slight compositional zonation. Significant quench overgrowths.
GROUNDMASS						
Plagioclase	2%-5%	2%-5%	0.02-1.5 mm		Acicular.	Radial, sheaf, and bow-tie bundles. Intergrown with granular pyroxene and acicular olivine.
Clinopyroxene	1%-2%	1%-2%	<0.2 mm		Anhedral, skeletal, and plumose.	Two varieties present. (1) equant, granular, anhedral, skeletal crystals intergrown with plagioclase and olivine, and; (2) microcrystalline, plumose variety.
Olivine	4%	4%	<0.5 mm		Acicular, skeletal.	
Titanomagnetite	2%-3%	2%-3%	<0.1 mm		Skeletal.	

VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	<2%	Dispersed.	0.1-0.4 mm	None.	Round.	

COMMENTS: Large (several mm diameter) crystal clot of intergrown plagioclase and clinopyroxene. Individual clinopyroxene crystals are prismatic, up to 2 mm in length, and poikilitic with large plagioclase inclusions. Individual plagioclase crystals are euhedral to subhedral, up to 2.5 mm in length. One large crystal is skeletal with a hollow interior. There is no preferred orientation of crystals. Small (<2 microns) sulfide blebs. Rock is very fresh. Description is based on two thin sections cut from the same sample.

142-864A-5Z-01 (Piece 1, 0-5 cm)

OBSERVER: BRO

WHERE SAMPLED: Unit 2

ROCK NAME: APHYRIC BASALT

GRAIN SIZE: Microcrystalline.

TEXTURE: Spherulitic (variolitic) with patches of intergranular texture. No glass.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1%	<1%	<1.5 mm		Euhedral.	Slight compositional zonation. Slight quench overgrowths.
Olivine	Trace	Trace	<0.25 mm		Euhedral.	Single crystal with well-developed bi-pyramidal external form.
GROUNDMASS						
Plagioclase	3%	3%	<0.6 mm		Acicular, skeletal.	Mostly individual microlites. Occasional radial or bow-tie bundles.
Olivine	1%	1%	<0.5 mm		Anhedral, equant.	Mostly individual crystals. Some skeletal. Intergrown with plagioclase in radial clusters.
Clinopyroxene	1%	1%	< 0.02 mm		Anhedral, skeletal.	Always present as intergrowths with plagioclase microlites in radial bundles.
Titanomagnetite	5%	5%	<0.05 mm		Anhedral.	

VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	3%	Dispersed.	<0.3-3.0 mm	None.	Round to slightly irregular.	

COMMENTS: Small (<2 microns) sulfide blebs. Rock is fresh.

142-864A-5Z-01 (Piece 5, 15-19 cm)

OBSERVER: BRO

WHERE SAMPLED: Unit 2

ROCK NAME: APHYRIC BASALT

GRAIN SIZE: Medium-grained.

TEXTURE: Intergranular. No glass.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1%	<1%	<1 mm		Euhedral to subhedral.	Strong compositional zonation. Slight quench overgrowths. Some glomerocrysts. Some resorbed-looking edges?
GROUNDMASS						
Plagioclase	40%	40%	<1 mm		Acicular, skeletal.	Radial, sheaf, and bow-tie bundles.
Olivine	1%	1%	<0.2 mm		Anhedral, equant.	
Clinopyroxene	40%	40%			Anhedral.	
Titanomagnetite	1%-3%	1%-3%	<0.15 mm		Euhedral to anhedral, skeletal.	Intergrown with, and surrounding plagioclase and olivine crystals. Some plumose clinopyroxene. Approaching a sub-ophitic texture. Interstitial to silicate minerals.
Mesostasis	10%	10%				
SECONDARY MINERALOGY	REPLACING/PERCENT	FILLING				COMMENTS
None.						

VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	5%	Dispersed.	0.03-0.3 mm	None.	Round to irregular.	One large (1 mm diameter) vesicle.

COMMENTS: Sub-ophitic groundmass texture. Patchy zones with no plagioclase microlites, often surrounding vesicles. Small (<2 microns) sulfide blebs interstitial to silicate minerals. Rock is fresh.

142-864A-SZ-01 (Piece 7, 24–29 cm)
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Microcrystalline
 TEXTURE: Spherulitic

OBSERVER: BCH

WHERE SAMPLED: Unit 2

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1%	<1%	<1 mm		Euhedral, elongated to tabular.	
GROUNDMASS						
Plagioclase	1%	1%	<0.15 mm		Acicular, skeletal.	There are patchy agglomerations of elongated plagioclase and olivine crystals.
Olivine	1%	1%	<0.1 mm		Elongated, skeletal.	
Clinopyroxene	Trace	Trace	<0.05 mm		Skeletal.	Very few grains show twinning.
Mesostasis	15–20	15–20				Dark brown to black, cryptocrystalline.
Magnetite	<1	<1	<0.005		Skeletal	
VESICLES/CAVITIES						
	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	4%–5%	Dispersed.	0.02–0.8 mm	None,	Irregular to round.	Large irregular vesicles occur in the mesostasis.
Veins	Trace		<0.01 mm	Fe-hydroxyoxides.		One small veinlet filled with reddish-yellow Fe-hydroxyoxides.
Fractures	Trace		<0.1 mm	None.		

COMMENTS: Individual spherules are outlined with a dark mesostasis, consist of very fine-grained coalesced spherules. The rock is fresh. The only evidence for a slight alteration is the subordinate occurrence of Fe-hydroxyoxides in small veinlets and in some vesicles.

142-864B-2W-01 (Piece 3)
 ROCK NAME: APHYRIC BASALT
 GRAIN SIZE: Fine-grained.
 TEXTURE: Interganular.

OBSERVER: BRO

WHERE SAMPLED: Unit 1

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	<1%	<1%	<1.5 mm		Subhedral.	Most crystals show evidence for resorption.
GROUNDMASS						
Plagioclase	40%	40%	<1.2 mm		Acicular.	Radial bundles common.
Olivine	1%–2%	1%–2%	<0.1 mm		Anhedral, equant	
Clinopyroxene	40%	40%	<0.4 mm		Anhedral, granular	Intergrown with plagioclase in radial bundles. Approaches a subophitic texture.
Titanomagnetite	4%	4%	<0.01 mm		Anhedral, skeletal.	
Sulfide	Trace	Trace	1–2 microns		Spherical.	Concentrated in mesostasis.
Globules						
VESICLES/CAVITIES						
	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS
Vesicles	1%–2%	Dispersed.	<0.4 mm	None.	Round to irregular.	

COMMENTS: Mesostasis constitutes 13%–15% of the groundmass. The rock is fresh.