

144-871C-33R-3 (Piece 3, 112–114 cm)

OBSERVER: DMC

WHERE SAMPLED: Clast in claystone.

ROCK NAME: Nephelinite

GRAIN SIZE: Microcrystalline.

TEXTURE: Microporphyritic, intergranular.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	5	10	1–2		Euhedral.	Xenocrysts?, small spinels, some embayed, many broken, deformation lamellae.
Olivine	1	1	<1		Skeletal.	
Titanaugite	1	1	0.2–0.5		Elongate prisms.	
Magnetite	<1	<1	0.1		Cubes.	Ilmenite cores.
GROUNDMASS						
Titanaugite	50	50	0.03–0.05		Equant prisms.	
Nepheline	20	20	0.01–0.5		Poikilitic to interstitial.	Optic sign confirmed.
Magnetite	15	15	0.01		Cubes.	
Biotite	2–3	2–3	0.1		Subhedral.	Associated with cloudy altered nepheline.
Apatite	5	5	0.1		Needles.	
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS
Clay	1	Nepheline				Cloudy, amorphous, irregular patches throughout.
Chlorite	2	Olivine				Pleochroic olive-green/clear.
Calcite	3	Olivine				
VESICLES/CAVITIES						
Vesicles	None	LOCATION	SIZE (mm)	FILLING	SHAPE	

COMMENTS: Sharp alteration boundary in section; fresh parts show little alteration; good for date, geochemistry.

144-871C-35R-1 (Piece 2C, 44–50 cm)

OBSERVER: DMC

WHERE SAMPLED: Thin flow or dike.

ROCK NAME: Basanite

GRAIN SIZE: Microcrystalline.

TEXTURE: Sparsely phyrlic, intergranular.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Clinopyroxene	4	5	2		Subhedral.	Titanaugite overgrowths on green diopsidic? cores, Xenocrysts?
Clinopyroxene	0	10	0.5–1		Subhedral.	Completely altered.
Spinel	<<1	<<1	1		Anhedral.	Brown translucent cores, opaque rims.
Spinel	<<1	<<1	<<1		Octahedral.	In clinopyroxene cores.
Olivine	0	1–2	1–4		Subhedral.	Completely altered.
GROUNDMASS						
Titanaugite	60	60	0.03		Equant prisms.	
Nepheline	10	10	0.02		Interstitial.	Identification tentative.
Magnetite	15	15	0.01–0.1		Cubes.	Larger cubes have ilmenite cores.
Plagioclase	10	10	0.02		Interstitial.	
Apatite	<1	<1	0.01		Needles.	
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS
Chlorite	1–2	Olivine				Colorless.
Clay	<1	Clinopyroxene				Dark green, subcircular patches.
Clay	10	Clinopyroxene				Light green/clear.
VESICLES/CAVITIES						
Vesicles	1	LOCATION	SIZE (mm)	FILLING	SHAPE	
		Groundmass	4	Calcite, brown clay	Irregular	

COMMENTS: Unit 1. Note abundant xenocrysts.

SITE 871

144-871C-35R-4 (Piece 5, 42–48 cm)
 ROCK NAME: Basanitoid
 GRAIN SIZE: Fine-grained.
 TEXTURE: Intersertal.

OBSERVER: DMC

WHERE SAMPLED: Clast in volcanic breccia.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	5	1–3		Euhedral.	Completely altered.
GROUNDMASS						
Titanaugite	25	50	0.02–0.04		Equant prisms.	Partially altered to green clay. Colorless, cloudy, after plagioclase and/or nepheline.
Magnetite	10	10	0.01–0.02		Subhedral.	
Apatite	2	2	<0.02		Needles.	
Matrix	40	40	<0.05		Interstitial.	
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS
Iddingsite	<1	Olivine				Narrow rims only.
Calcite	1	Olivine				
Light brown clay	4	Olivine				

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	None				

COMMENTS: Altered. Not datable.

144-871C-36R-1 (Piece 4, 36–39 cm)
 ROCK NAME: Basanitoid
 GRAIN SIZE: Fine-grained.
 TEXTURE: Microporphyritic, intersertal.

OBSERVER: DMC

WHERE SAMPLED: Top 1 m flow.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	15	1–2		Euhedral.	Completely altered.
GROUNDMASS						
Titanaugite	50	50	0.02–0.04		Elongate prisms.	Colorless, cloudy, after plagioclase and/or nepheline.
Magnetite	10	10	0.01–0.02		Subhedral.	
Apatite	1	1	<0.02		Needles.	
Spinel	<<1	<<1	<0.01		In olivine.	
Matrix	40	40	<0.05		Interstitial.	
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS
Iddingsite	<1	Olivine				Narrow rims only.
Light brown clay	12	Olivine				
Calcite	2–3	Olivine				

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	5		3	Calcite	Irregular

COMMENTS: Finer, less crystalline equivalent of associated basanites.

144-871C-36R-3 (Piece 2, 25–31 cm)
 ROCK NAME: Basanite
 GRAIN SIZE: Fine-grained.
 TEXTURE: Microporphyritic, intersertal.

OBSERVER: DMC

WHERE SAMPLED: Near base 1 m, Unit 13.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	1	15	1–3		Euhedral.	Mostly altered.
Titanaugite	<1	<1	0.5		Elongate prisms.	
GROUNDMASS						
Titanaugite	50	50	0.02–0.04		Elongate prisms.	
Plagioclase	10	>10	<0.1		Poikilitic to interstitial.	
Magnetite	10	10	0.01–0.02		Subhedral.	
Apatite	1	1	<0.02		Needles.	
Matrix	10	10	<0.05		Interstitial.	Colorless, cloudy, isotropic, altered plagioclase and/or nepheline.
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS
Light brown clay	15	Olivine				
Iddingsite	<1	Olivine				Rims only.
VESICLES/CAVITIES						
	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	
Vesicles	<1		3–4	Calcite	Irregular	

COMMENTS: Very similar to Unit 9.

144-871C-37R-1 (Piece 9, 84–85 cm)
 ROCK NAME: Basanitoid
 GRAIN SIZE: Fine-grained.
 TEXTURE: Microporphyritic, intersertal.

OBSERVER: DMC

WHERE SAMPLED: Middle 1 m flow, Unit 15.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	20	1–3		Euhedral, some broken.	Completely altered.
Titanaugite	5	5	0.2–0.4		Elongate prisms.	
GROUNDMASS						
Titanaugite	30	60	0.01–0.02		Elongate prisms.	Altered to green clay.
Magnetite	10	10	0.01		Cubes.	
Matrix	30	30	<0.05		Interstitial.	Colorless, cloudy, isotropic, altered plagioclase and/or nepheline.
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS
Green clay	30	Titanaugite				
Light brown clay	20	Olivine				
VESICLES/CAVITIES						
	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	
Vesicles	None					

COMMENTS: Finer than Units 9 and 13, finest at site.

SITE 871

144-871C-38R-1 (Piece 8, 87-88 cm)

OBSERVER: DMC

WHERE SAMPLED: Upper part, thick massive flow.

ROCK NAME: Basanite

GRAIN SIZE: Microcrystalline.

TEXTURE: Microporphyrritic, intergranular.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	10	15	0.5-2		Subhedral.	
Titanaugite	10	10	0.5		Elongate prisms.	
GROUNDMASS						
Titanaugite	60	60	0.01-0.1		Equant prisms.	
Plagioclase	20	20	<1-5		Poikilitic to interstitial.	
Nepheline	<5	10	<0.1		Interstitial.	Cloudy where altered, identification is tentative.
Magnetite	10	10	0.02		Cubes.	
Apatite	<1	<1	0.05		Needles.	
SECONDARY MINERALOGY						
Clay	5	REPLACING/ FILLING Olivine				Olive green.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	
Vesicles	10	Groundmass	0.5-2	Calcite	Round	

144-871C-38R-3 (Piece 2, 22-24 cm)

OBSERVER: DMC

WHERE SAMPLED: Massive flow.

ROCK NAME: Basanite

GRAIN SIZE: Microcrystalline.

TEXTURE: Microporphyrritic, intergranular.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	10	0.1-0.2		Euhedral.	Completely altered.
Titanaugite	5	5	0.05-0.1		Euhedral.	
GROUNDMASS						
Titanaugite	50	50	0.02		Equant prisms.	
Nepheline	20	20	0.01-0.1		Poikilitic to interstitial.	Generally fresh, some clouding.
Plagioclase	10	10	<0.05		Interstitial.	
Magnetite	10	10	0.02		Ilmenite cores in larger grains.	
Apatite	2-3	2-3	<0.01		Fine needles.	
SECONDARY MINERALOGY						
Iddingsite	<1	REPLACING/ FILLING Olivine				Narrow rims.
Clay	5	Olivine				Green/clear.
Chlorite	5	Olivine				Colorless, low birefringence.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	
Vesicles	<1	Groundmass	>0.5	Calcite	Irregular	

144-871C-38R-6 (Piece 1D , 52-55 cm)
 ROCK NAME: Basanite
 GRAIN SIZE: Microcrystalline.
 TEXTURE: Olivine phyrlic, intergranular.

OBSERVER: DMC

WHERE SAMPLED: Massive flow.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	15	1-2		Subhedral.	Highly altered.
GROUNDMASS						
Titanaugite	60	60	0.01-0.05	An ₃₅	Equant prisms.	
Plagioclase	20	20	<1-5		Poikilitic.	Striking texture.
Nepheline	<5	10	<1		Interstitial to poikilitic.	Cloudy, altered, identification is tentative.
Magnetite	10	10	0.02-0.05		Cubes.	
Apatite	5	5	0.1		Needles.	
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS
Iddingsite	1	Olivine				Thin rims only.
Clay	15	Olivine				Green/brown.
Calcite	1	Olivine				
Clay	5	Nepheline				In cloudy, almost isotropic areas.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	None				

COMMENTS: Unit 19. Fresh plagioclase should date well.

144-871C-38R-6 (Piece 1F, 99-100 cm)
 ROCK NAME: Basanite
 GRAIN SIZE: Microcrystalline.
 TEXTURE: Olivine phyrlic, intergranular.

OBSERVER: DMC

WHERE SAMPLED: Massive flow.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	5	15	1-2		Subhedral.	Altered.
GROUNDMASS						
Titanaugite	60	60	<0.2		Equant prisms.	
Plagioclase	20	20	<1-5		Poikilitic.	
Nepheline	<5	10	0.1		Interstitial.	Cloudy, altered, identification is uncertain.
Magnetite	10	10	0.02		Cubes.	
Apatite	5	5	0.01		Needles.	
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS
Iddingsite	5	Olivine				Rims only.
Chlorite	10	Olivine				Green.
Clay	5	Nepheline				In cloudy, low birefringent areas.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	None				

COMMENTS: Same as Sample 38R-6, 52-55 cm, slightly less plagioclase. Unit 19.

SITE 871

144-871C-38R-7 (Piece 1C, 17-19 cm)
 ROCK NAME: Basanite
 GRAIN SIZE: Microcrystalline.
 TEXTURE: Olivine phytic, intergranular.

OBSERVER: DMC

WHERE SAMPLED: Lower part, massive flow, Unit 20.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	15	1-2			
GROUNDMASS						
Titanaugite	60	60	0.01-0.1		Equant prisms.	
Plagioclase	20	20	<1-5		Poikilitic to interstitial.	
Nepheline	<5	10	<1		Interstitial.	Cloudy where altered, identification is tentative.
Magnetite	10	10	0.02		Cubes.	
Apatite	2-3	2-3	<0.2			
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS
Iddingsite	1	Olivine				Narrow rims only.
Clay	5	Olivine				Green/brown.
Calcite	<<1	Olivine				
Clay	5	Nepheline				Cloudy, low RI, very low birefringence.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	None				

COMMENTS: Identical to overlying Unit 19.

144-871C-39R-1 (Piece 2, 81-83 cm)
 ROCK NAME: Basanite
 GRAIN SIZE: Fine-grained.
 TEXTURE: Microporphyritic, intergranular.

OBSERVER: DMC

WHERE SAMPLED: Massive flow, Unit 21.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	15	1-2		Subhedral.	Completely altered.
GROUNDMASS						
Titanaugite	55	55	<0.1		Prisms.	Finely zoned.
Plagioclase	20	20	0.1-0.5		Poikilitic.	
Magnetite	10	10	0.03		Cubes.	
Nepheline	15	15	0.02-0.05		Interstitial.	Often cloudy, low RI, birefringence, identification is tentative.
Apatite	3	3	<0.01		Needles.	
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS
Clay	1-2	Nepheline				Cloudy.
Chlorite	12	Olivine				Olive green-brown.
Iddingsite	3	Olivine				Rims only.

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE
Vesicles	None.				

COMMENTS: Minor biotite associated with nepheline. Groundmass alteration makes poor for geochemistry or dating.

144-871C-39R-5 (Piece 10, 113–115 cm)

OBSERVER: DMC

WHERE SAMPLED: Lower part, thick flow.

ROCK NAME: Basanite

GRAIN SIZE: Microcrystalline.

TEXTURE: Olivine phyric, intergranular.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	10	1–2		Subhedral.	Completely altered, iddingsite rims, colorless chlorite.
GROUNDMASS						
Titanaugite	60	60	0.01–0.05		Equant prisms.	
Plagioclase	15	15	<0.1	An ₃₅	Poikilitic to interstitial.	Composition not robust.
Nepheline	15	15	<0.05		Interstitial.	Low RI, cloudy, ID not confirmed.
Magnetite	10	10	0.01–0.03		Cubes.	
Spinel	<<1	<<1	0.05		Anhedral.	Embayed.
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS
Iddingsite	2	Olivine				Replaces phenocryst rims.
Chlorite	10	Olivine				Colorless, replaces cores.
Clay	10	Nepheline				Colorless, causes clouding.
VESICLES/CAVITIES						
Vesicles	None	LOCATION	SIZE (mm)	FILLING	SHAPE	

COMMENTS: Also <1% apatite needles. Sample too altered to be a good dating prospect.

144-871C-39R-6 (Piece 6, 118–120 cm)

OBSERVER: DMC

WHERE SAMPLED: Upper part, thick flow.

ROCK NAME: Basanite

GRAIN SIZE: Microcrystalline.

TEXTURE: Olivine phyric, intergranular.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	15	1–3		Subhedral.	Completely altered.
Clinopyroxene	<1	5	1–2		Subhedral prisms.	Green, titanaugite rims.
GROUNDMASS						
Titanaugite	50	50	0.05–0.1		Equant prisms.	
Plagioclase	15	15	0.01–0.1		Poikilitic to intersertal.	
Nepheline	15	15	0.01–0.1		Intersertal.	Altered cloudy, some with mottled extinction.
Magnetite	10	10	0.01–0.02		Cubes.	
Apatite	<<1	<<1	0.01		Needles.	
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS
Iddingsite	1	Olivine/clinopyroxene				Replaces rims.
Chlorite	5	Olivine				Colorless/light brown, low birefringence, replaces cores.
Clay	5	Clinopyroxene				Green/brown, higher birefringence.
Clay	15	Nepheline				Colorless, mottled extinction in some cases.
VESICLES/CAVITIES						
Vesicles	None	LOCATION	SIZE (mm)	FILLING	SHAPE	

COMMENTS: Unit 22.

SITE 871

144-871C-40R-4 (Piece 3C, 62-64 cm)
 ROCK NAME: Basanite
 GRAIN SIZE: Microcrystalline.
 TEXTURE: Microphyric, intersertal.

OBSERVER: DMC

WHERE SAMPLED: Near base thick flow, Unit 22.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	20	1-3		Euhedral.	Completely altered.
GROUNDMASS						
Titanaugite	60	60	0.02-0.1		Elongate prisms.	
Magnetite	51	15	0.01		Anhedral.	
Apatite	<1	<1	0.02		Needles.	
Unresolved matrix.	25	25	<0.1		Interstitial.	Cloudy, colorless, after plagioclase and/or nepheline.
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS
Iddingsite	1	Olivine				Thin rims only.
Light brown clay	20	Olivine				
VESICLES/CAVITIES						
	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	
Vesicles	1	1-3		Brown clay, calcite	Irregular	

COMMENTS: Finer and more altered than overlying section.