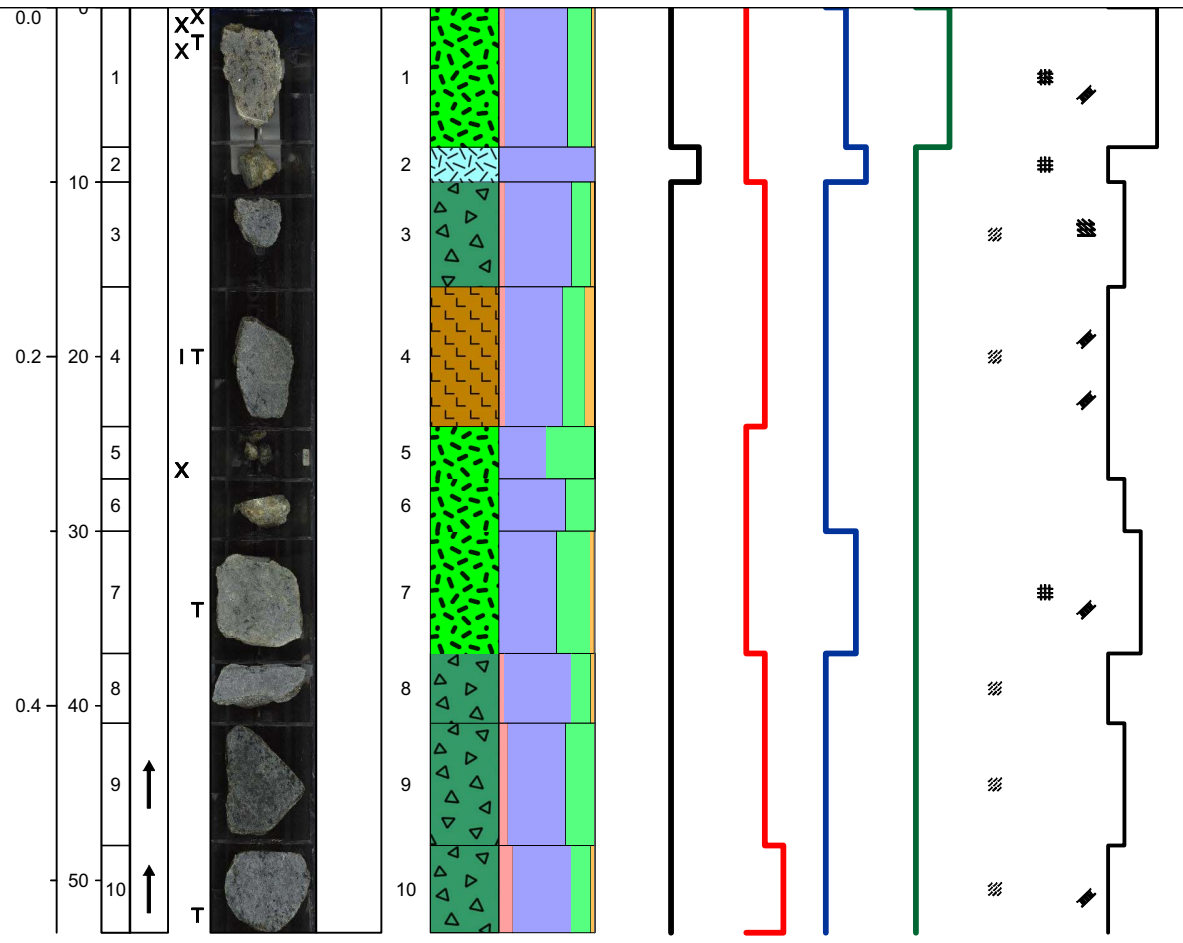
Hole 345-U1415H-1R Section 1, Top of Section: 0.0 m (CSF-A)



LITHOLOGIC INTERVAL: 1
SECTION: 345-U1415H-1R-1-A
ROCK NAME: olivine-bearing gabbro
GRAIN SIZE: medium grained
TEXTURE: granular
PIECES: #1
CONTACTS: contact not recovered
MODAL ABUNDANCES

Primary Mineral	Percent	Size Max mm	Shape	Habit
olivine	7.0	3.0	euhedral-subhedral	subequant
plagioclase	65.0	3.0	euhedral-subhedral	tabular
clinopyroxene	25.0	3.0	anhedral	interstitial
orthopyroxene	3.0	1.2	subhedral	prismatic
oxide	0.1	0.1	anhedral	subequant
sulfide	0.1	0.1	anhedral	equant

COMMENTS
IGNEOUS: Originally described as olivine gabbro. New lithology comes from thin section description. Modal abundances reflect macroscopic description.
ALTERATION: Vuggy texture, cataclastic rock. Anastamosing massive pale green amphibole vein, 5mm in width.
STRUCTURE: Localized zone of cataclasite overprinting thin zone of protomylonitic fabric.

LITHOLOGIC INTERVAL: 2
SECTION: 345-U1415H-1R-1-A
ROCK NAME: anorthosite
GRAIN SIZE: coarse grained
TEXTURE:
PIECES: #2
CONTACTS: contact not recovered
MODAL ABUNDANCES

Primary Mineral	Percent	Size Max mm	Shape	Habit
plagioclase	100.0	7.0	euhedral-subhedral	tabular
orthopyroxene	0.1	1.2	subhedral	prismatic
oxide	0.1	0.1	anhedral	subequant
sulfide	0.1	0.1	anhedral	equant

COMMENTS
ALTERATION: Cataclastic rock, cemented by prehnite.
STRUCTURE: cataclasite

LITHOLOGIC INTERVAL: 3
SECTION: 345-U1415H-1R-1-A
ROCK NAME: orthopyroxene-bearing olivine gabbro
GRAIN SIZE: medium grained
TEXTURE: granular
PIECES: #3
CONTACTS: contact not recovered
MODAL ABUNDANCES

Primary Mineral	Percent	Size Max mm	Shape	Habit
olivine	7.0	3.0	euhedral-subhedral	subequant
plagioclase	70.0	3.0	euhedral-subhedral	tabular
clinopyroxene	20.0	3.0	anhedral	interstitial
orthopyroxene	4.0	2.2	subhedral	prismatic
oxide	0.1	0.2	subhedral	equant

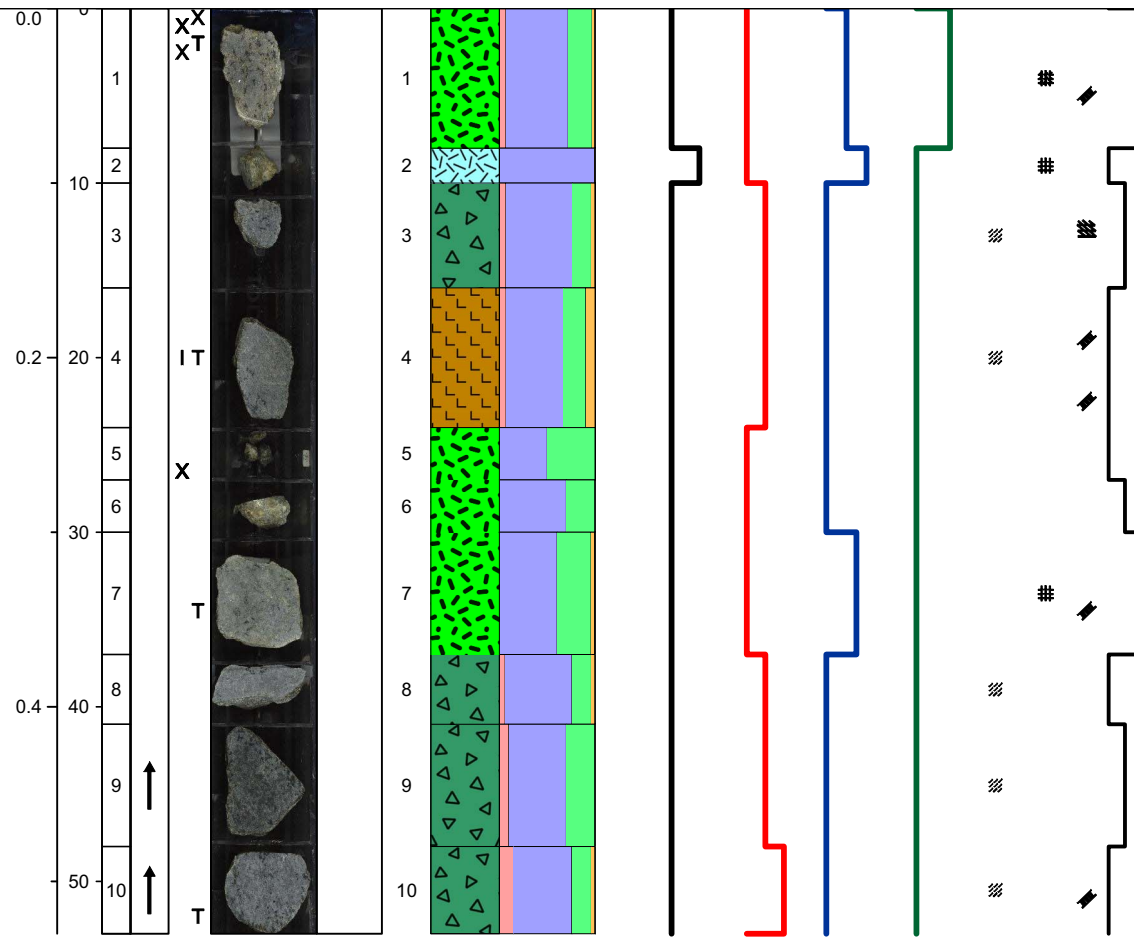
COMMENTS
ALTERATION: Minimal alteration except for the olivine which is completely replaced in a mesh texture to serpentine, and locally to talc and to a clay mineral. Plagioclase is locally altered to chlorite adjacent to olivine. Amphibole is pseudomorphically replaced by amphibole. Composite polycrystalline amphibole and secondary plagioclase vein, 5mm in width.
STRUCTURE: Magmatic foliation defined by plagioclase and olivine SPO.

LITHOLOGIC INTERVAL: 4
SECTION: 345-U1415H-1R-1-A
ROCK NAME: olivine-bearing gabbronorite
GRAIN SIZE: medium grained
TEXTURE: granular
PIECES: #4
CONTACTS: contact not recovered
MODAL ABUNDANCES

Primary Mineral	Percent	Size Max mm	Shape	Habit
olivine	7.0	3.0	euhedral-subhedral	subequant
plagioclase	60.0	7.0	euhedral-subhedral	tabular
clinopyroxene	23.0	4.0	anhedral	interstitial
orthopyroxene	10.0	9.0	subhedral	prismatic

COMMENTS
IGNEOUS: Originally described as olivine gabbronorite. New lithology comes from thin section description. Modal abundances reflect macroscopic description.
ALTERATION: Weakly altered, with olivine nearly completely replaced by talc, and less commonly by serpentine in mesh texture. Plagioclase is sparingly altered to chlorite near olivine, and clinopyroxene may have pale amphibole rims. Veined with a network of <0.5mm amphibole, prehnite, and clay veins.
STRUCTURE: Magmatic foliation defined by plagioclase and clinopyroxene SPO.

Hole 345-U1415H-1R Section 1, Top of Section: 0.0 m (CSF-A)



LITHOLOGIC INTERVAL: 5
SECTION: 345-U1415H-1R-1-A
ROCK NAME: gabbro
GRAIN SIZE: medium grained
TEXTURE: granular
PIECES: #5
CONTACTS: contact not recovered
MODAL ABUNDANCES

Primary Mineral	Percent	Size Max mm	Shape	Habit
plagioclase	50.0	2.0	euhedral-subhedral	tabular
clinopyroxene	50.0	3.0	anhedral	interstitial

LITHOLOGIC INTERVAL: 6
SECTION: 345-U1415H-1R-1-A
ROCK NAME: gabbro
GRAIN SIZE: medium grained
TEXTURE: poikilitic granular
PIECES: #6
CONTACTS: contact not recovered
MODAL ABUNDANCES

Primary Mineral	Percent	Size Max mm	Shape	Habit
olivine	0.1	2.0	euhedral-subhedral	subequant
plagioclase	70.0	3.0	euhedral-subhedral	tabular
clinopyroxene	30.0	5.0	anhedral	interstitial
sulfide	0.1	0.3	anhedral	equant

COMMENTS
ALTERATION: Moderately altered rock with talc and tremolite after olivine, and also more commonly serpentine after olivine. Plagioclase is altered to chlorite where it contacts relict olivine.

LITHOLOGIC INTERVAL: 7
SECTION: 345-U1415H-1R-1-A
ROCK NAME: orthopyroxene-bearing gabbro
GRAIN SIZE: medium grained
TEXTURE: poikilitic granular
PIECES: #7
CONTACTS: contact not recovered
MODAL ABUNDANCES

Primary Mineral	Percent	Size Max mm	Shape	Habit
olivine	0.1	2.0	euhedral-subhedral	subequant
plagioclase	60.0	5.0	euhedral-subhedral	lath-shaped
clinopyroxene	35.0	8.0	anhedral	interstitial
orthopyroxene	4.0	3.0	subhedral	prismatic
oxide	0.1	0.2	anhedral	subequant
sulfide	0.3	0.2	anhedral	equant

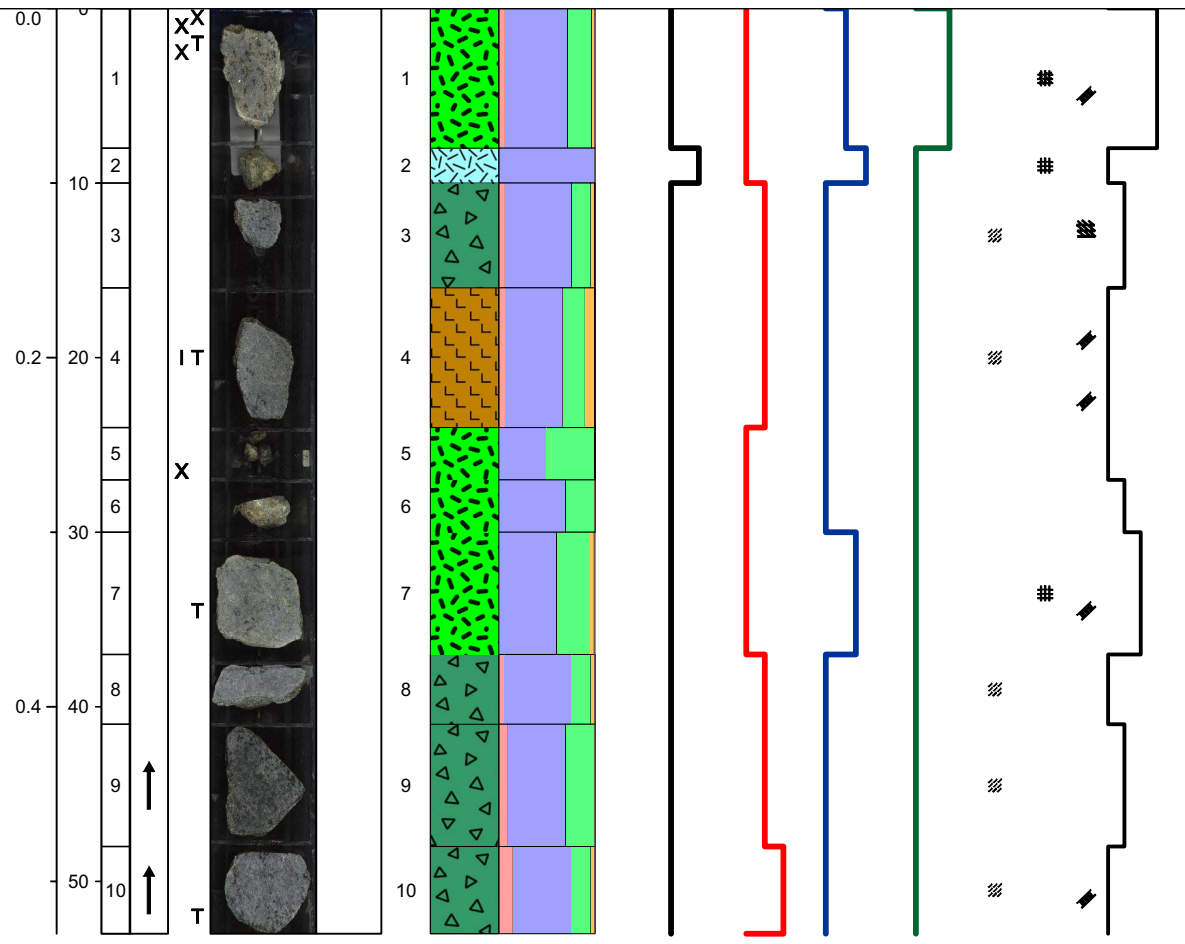
COMMENTS
ALTERATION: Highly altered cataclastic rock with numerous veins of (probably?) prehnite. Pyroxene is slightly altered to amphibole, olivine is completely altered to serpentine and clay minerals.
STRUCTURE: Cataclasite with deformed prehnite vein. High density thin alteration veins in a cross-cutting network.

LITHOLOGIC INTERVAL: 8
SECTION: 345-U1415H-1R-1-A
ROCK NAME: orthopyroxene-bearing olivine gabbro
GRAIN SIZE: medium grained
TEXTURE: granular
PIECES: #8
CONTACTS: contact not recovered
MODAL ABUNDANCES

Primary Mineral	Percent	Size Max mm	Shape	Habit
olivine	6.0	3.0	euhedral-subhedral	subequant
plagioclase	70.0	3.0	euhedral-subhedral	tabular
clinopyroxene	20.0	3.0	anhedral	interstitial
orthopyroxene	4.0	7.0	subhedral-anhedral	prismatic
sulfide	0.1	0.1	anhedral	equant

COMMENTS
ALTERATION: Slightly altered, olivine is replaced by serpentine and clay minerals, clinopyroxene is replaced by amphibole. Thin veins of prehnite cut piece. Vug with zeolite is present, also clay minerals in cataclastic seams.
STRUCTURE: Magmatic foliation defined by plagioclase and olivine SPO. Low density of alteration veins

Hole 345-U1415H-1R Section 1, Top of Section: 0.0 m (CSF-A)



LITHOLOGIC INTERVAL: 9
SECTION: 345-U1415H-1R-1-A
ROCK NAME: olivine gabbro
GRAIN SIZE: medium grained
TEXTURE: granular
PIECES: #9
CONTACTS: contact not recovered

MODAL ABUNDANCES

Primary Mineral	Percent	Size Max mm	Shape	Habit
olivine	10.0	3.0	euhedral-subhedral	subequant
plagioclase	60.0	3.0	euhedral-subhedral	lath-shaped
clinopyroxene	30.0	8.0	anhedral	interstitial
orthopyroxene	0.1	1.4	subhedral	prismatic
sulfide	0.1	0.1	anhedral	equant

COMMENTS

ALTERATION: Plagioclase is very fresh, except for chlorite rims surrounding olivine. Olivine is serpentinized and altered to clay minerals and pyrite in places.

STRUCTURE: Magmatic foliation defined by plagioclase and olivine SPO.

LITHOLOGIC INTERVAL: 10
SECTION: 345-U1415H-1R-1-A
ROCK NAME: olivine gabbro
GRAIN SIZE: medium grained
TEXTURE: granular
PIECES: #10
CONTACTS: contact not recovered

MODAL ABUNDANCES

Primary Mineral	Percent	Size Max mm	Shape	Habit
olivine	15.0	3.0	euhedral-subhedral	subequant
plagioclase	60.0	3.0	euhedral-subhedral	lath-shaped
clinopyroxene	20.0	12.0	anhedral	interstitial
orthopyroxene	4.0	7.0	subhedral	prismatic
sulfide	0.1	0.1	anhedral	equant

COMMENTS

IGNEOUS: Originally described as orthopyroxene-bearing olivine gabbro. New lithology comes from thin section description. Modal abundances reflect macroscopic description.

ALTERATION: Relatively fresh rock, serpentinization of olivine accounts for most of the alteration in this piece. Serpentinitization is concentrated in oriented domains ~8mm thick and spaced 2 cm, no prehnite is observed, weakly developed corona textures.

STRUCTURE: Magmatic foliation defined by plagioclase, olivine, and clinopyroxene SPO. Low density of curved, overlapping thin alteration veins

THIN SECTION: 345-U1415H-1R-1-W 0/4-TSB_Piece_1-TS_07 **Thin Section no.:** 7
Rock name: olivine-bearing gabbro
Rock comment: moderately altered, incipient cataclasis
Lithologic interval: 1
Piece No.: #1 **Authors: NA, JK, MP**
Billet request comment: IgPet: Primary mineralogy; Met-Pet: Alteration

PRIMARY MINERALOGY **No. of Igneous domains:** 1 **Nature of ign. domains:**

Igneous domain number: 1 **Domain lithology:** olivine-bearing gabbro
Domain grain size: medium grained **Grain size distribution:** equigranular
Domain texture: heterogranular **Relative abundance (%):** 100
Domain comment: Due to very strong cataclastic/metamorphic overprint primary mode and mineral features are hardly to estimate

	Present (%)	Original (%)	Vol. repl. (%)	Size mode (mm)	Shape	Habit	Zoning	Color	Special features	Comment
Olivine	0	2	2	0.3	anhedral	tabular				totally altered
Plagioclase	20	60	40	0.2	subhedral-anhedral	tabular	continuous zoning			
Clinopyroxene	20	38	18	0.25	anhedral	subequant				some poikilitic grains include anhedral plagioclase
Oxide	0.1	0.1	0	0.1	subhedral	equant				mostly included in plagioclase or present on the grain boundaries; some inclusions in olivine, probably replaced spinel

ALTERATION / METAMORPHISM **No. of alteration domains:** 2 **Domain rel. abund %:** 30 **Estimated total % alteration:** 85
Alteration domain number: 1 **Domain type:** cataclastic zone

SECONDARY MINERALOGY	%	REPLACING / FILLING
chlorite	1.5	clinopyroxene 1.5%
clay minerals	11	olivine 2%, plagioclase 9%
green amphibole	24	clinopyroxene 24%
oxide	1	olivine 1%
serpentine	7.6	olivine 7%, clinopyroxene 0.6%
zeolite	36	plagioclase 36%
other	3.9	clinopyroxene 3.9%
domain total alteration %:	**85**	

PRIMARY MINERAL REPLACED	% ORIGINAL	% ALTERED	REPLACEMENT MINERAL	ALTERATION COMMENTS
Olivine	10	100	clay minerals 20%, oxide 10%, serpentine 70%	Mesh texture present in the background deformed and cut by the cataclastic deformation.
Plagioclase	50	90	clay minerals 20%, zeolite 80%	
Clinopyroxene	40	75	green amphibole 80%, chlorite 5%, serpentine 2%, other 13%	

Vein summary
vein 1 Zeolite veins crosscutting or elongating in the same direction as the cataclastic deformation. Massive texture with prismatic minerals, soft veins filled with an isotropic mineral, probably zeolite. Late veins crosscutting all minerals are deformed along the cataclastic slipping main axis.

ALTERATION COMMENT: Cataclastic zone along the section with partial zeolite filling, heterogeneous alteration of the background with very fine grained clay-rich vein surrounding blocks of relatively fresh gabbro. Abundant cataclastic deformation crosscut by zeolite and clay veins. A small amount of pyrite in fine-grained chlorite matrix and chlorite-filled fractures in plagioclase.

ALTERATION / METAMORPHISM **No. of alteration domains:** 2 **Domain rel. abund %:** 70 **Estimated total % alteration:** 65
Alteration domain number: 2 **Domain type:** background

SECONDARY MINERALOGY	%	REPLACING / FILLING
chlorite	2.7	clinopyroxene 1.2%, plagioclase 1.5%
clay minerals	8	olivine 2%, plagioclase 6%
green amphibole	19.2	clinopyroxene 19.2%
oxide	1	olivine 1%
secondary plagioclase	1.5	plagioclase 1.5%
serpentine	7.5	olivine 7%, clinopyroxene 0.5%
zeolite	21	plagioclase 21%
other	3.1	clinopyroxene 3.1%
domain total alteration %:	**64**	

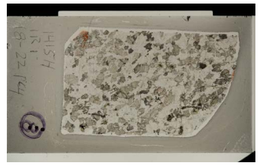
PRIMARY MINERAL REPLACED	% ORIGINAL	% ALTERED	REPLACEMENT MINERAL	ALTERATION COMMENTS
Olivine	10	100	clay minerals 20%, oxide 10%, serpentine 70%	Mesh texture characteristic of olivine alteration. Magnetite alignment along the mesh rim. Patchy transformation of serpentine into clay.
Plagioclase	50	60	chlorite 5%, clay minerals 20%, zeolite 70%, secondary plagioclase 5%	Plagioclase pervasively altered into zeolite with minute replacement in the core of large grains and patchy crystallization of zeolite in the grain interval. Minor chlorite and clays are observed in association with zeolite in the core of grains.
Clinopyroxene	40	60	green amphibole 80%, chlorite 5%, serpentine 2%, other 13%	Replacement of clinopyroxene by green amphibole along the cleavage. Presence of traces of serpentine close to former olivine.

ALTERATION COMMENT: Pervasive alteration of the background with patchy replacement of plagioclases by zeolite. Abundant cataclastic deformation crosscut by zeolite and clay veins. Pyrite commonly occurs in chlorite-filled fractures in plagioclase; a small amount of pyrite grains occur along clinopyroxene cleavage surfaces.

STRUCTURE COMMENT: Magmatic: No recognizable magmatic fabric. Small relict patches of annealed plagioclase.
Crystal Plastic: No recognizable crystal plastic deformation preserved.
Brittle: Dense anastomosing, but localized fractures and incipient brecciation/cataclasis (<20% matrix). Entire section intensely 'shattered' with no fill.
Veins/alteration: mm-thick wedgy veins filled with undeformed prehnite and serpentine, cut plagioclase and clinopyroxene, but not the cataclasite.
Cross-cutting Relationships (as apparent in thin section):
1) Alteration veins.
2) Cataclasis.

PHOTOMICROGRAPHS: 345_U1415H_1R_1_TS_07.JPG
345_U1415H_1R_1_TS_07-2.JPG

THIN SECTION: 345-U1415H-1R-1-W 18/22-TSB_Piece_4-TS_08 **Thin Section no.:** 8
Rock name: olivine-bearing gabbronorite
Rock comment: weakly altered, weak magmatic foliation
Lithologic interval: 4
Piece No.: #4 **Authors: MMJ, KF**
Billet request comment: IgPet: Primary Mineralogy



PRIMARY MINERALOGY **No. of Igneous domains:** 1 **Nature of ign. domains:**

Igneous domain number: 1 **Domain lithology:** olivine-bearing gabbronorite
Domain grain size: medium grained **Grain size distribution:** equigranular
Domain texture: granular **Relative abundance (%):** 100
Domain comment: It was macroscopically described as olivine gabbronorite, however, olivine was found to be less than the definition for olivine gabbro (see methods)

	Present (%)	Original (%)	Vol. repl. (%)	Size mode (mm)	Shape	Habit	Zoning	Color	Special features	Comment
Olivine	0	3	3		anhedral					olivine has been totally replaced
Plagioclase	47	50	3	1	euhedral-subhedral	lath-shaped	continuous zoning		curved grain boundaries	one plagioclase crystal with either a "ghost" core plagioclase or hourglass zoning
Clinopyroxene	30	35	5	2	euhedral-subhedral	tabular		pale green	twinnings	clinopyroxene oikocryst with plagioclase chadacryst
Orthopyroxene	10	12	2	2	euhedral-subhedral	subequant		pinkish green		show pleochroism
Oxide	0.1	0.1	0	0.1	anhedral	granular				

ALTERATION / METAMORPHISM **No. of alteration domains:** 1 **Domain rel. abund %:** 100 **Estimated total % alteration:** 5
Alteration domain number: 1 **Domain type:** background

SECONDARY MINERALOGY	%	REPLACING / FILLING
green amphibole	2	clinopyroxene 1.8%, orthopyroxene 0.3%
pale/colorless amphibole	2.1	olivine 2.1%
prehnite	3	plagioclase 3%
serpentine	0.6	olivine 0.6%
talc	0.3	olivine 0.3%
domain total alteration %:	**8**	

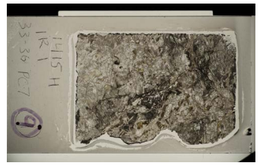
PRIMARY MINERAL REPLACED	% ORIGINAL	% ALTERED	REPLACEMENT MINERAL	ALTERATION COMMENTS
Olivine	3	100	pale/colorless amphibole 70%, serpentine 20%, talc 10%	
Plagioclase	60	5	prehnite 100%	Plagioclase altered along cracks and fractures to something very fine grained, likely prehnite.
Clinopyroxene	35	5	green amphibole 100%	Clinopyroxene altered along cleavage planes.
Orthopyroxene	5	5	green amphibole 100%	Orthopyroxene altered along cleavage planes.

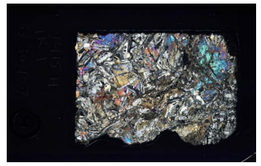
ALTERATION COMMENT: Very low degree of homogeneous, pervasive alteration. Pyrite occurs in clay-mineral pseudomorphs after olivine, along cleavage surfaces of clinopyroxene, and chlorite-filled fractures in plagioclase.

STRUCTURE COMMENT:
Magmatic: Weak magmatic foliation defined by SPO of plagioclase and clinopyroxene, with annealed grain boundaries. Very rare submagmatic deformation twins and/or bent grains of plagioclase.
Crystal Plastic: Rare undulose extinction of pyroxene; subgrain formation in plagioclase.
Brittle: Very minor cracking of plagioclase and pyroxene, with no grain size reduction. Cracks filled with chlorite and prehnite.
Veins/alteration None.
Cross-cutting Relationships (as apparent in thin section):
1) Magmatic foliation development.
2) Minor cracking.

PHOTOMICROGRAPHS:
345_U1415H_1R_1_TS_08.JPG
345_U1415H_1R_1_TS_08-2.JPG

THIN SECTION: **345-U1415H-1R-1-W 33/36-TSB_Piece_7-TS_09** **Thin Section no.:** **9**
Rock name: orthopyroxene- and olivine-bearing gabbro
Rock comment: moderately altered, with localized cataclasis
Lithologic interval: 7
Piece No.: #7 **Authors: TH, KF**
Billet request comment: IgPet: Primary Mineralogy





PRIMARY MINERALOGY **No. of Igneous domains:** 1 **Nature of ign. domains:**

Igneous domain number: 1 **Domain lithology:** orthopyroxene -and- olivine-bearing gabbro
Domain grain size: medium grained **Grain size distribution:** inequigranular
Domain texture: ophitic **Relative abundance (%):** 100
Domain comment: Vein is formed by cataclastic deformation. Plagioclase and clinopyroxene show crystal plastic deformation

	Present (%)	Original (%)	Vol. repl. (%)	Size mode (mm)	Shape	Habit	Zoning	Color	Special features	Comment
Olivine	0	2	2	1.5	anhedral	equant				completely altered
Plagioclase	48	50	2	2	subhedral	tabular	continuous zoning			deformation twin
Clinopyroxene	44	44	0	6	anhedral	irregular		colorless	ophitic	lamellae bearing clinopyroxene plastically deformed
Orthopyroxene	1	4	3	2	anhedral to subhedral	prismatic		colorless		
Oxide	0.1	0.1	0	0.3	anhedral	subequant				

ALTERATION / METAMORPHISM **No. of alteration domains:** **1** **Domain rel. abund %:** 100 **Estimated total % alteration:** 40
Alteration domain number: 1 **Domain type:** background

SECONDARY MINERALOGY	%	REPLACING / FILLING
chlorite	12.1	clinopyroxene 3.6%, orthopyroxene 1%, plagioclase 7.5%
clay minerals	3	orthopyroxene 3%
green amphibole	8.4	clinopyroxene 8.4%
talc	6	orthopyroxene 6%
other	17.5	plagioclase 17.5%
domain total alteration %:	**47**	

PRIMARY MINERAL REPLACED	% ORIGINAL	% ALTERED	REPLACEMENT MINERAL	ALTERATION COMMENTS
Plagioclase	50	50	chlorite 30%, other 70%	Plagioclase highly fractured and bent, shows undulose extinction, altered to something fine grained along fractures (too fine grained to identify).
Clinopyroxene	40	30	green amphibole 70%, chlorite 30%	
Orthopyroxene	10	100	chlorite 10%, clay minerals 30%, talc 60%	

Vein summary
vein 1 Prehnite filled vein, associated with some hydro-garnet.

ALTERATION COMMENT: Degree of alteration increases prehnite vein. Cataclastic texture, especially localized close to prehnite vein. Plagioclase is highly fractured, bent and shows undulose extinction, Clinopyroxene has bent cleavage planes. Pyrite occurs as relatively large grains in clay-mineral pseudomorphs after olivine, and rarely as tiny grains along clinopyroxene cleavage surfaces.

STRUCTURE COMMENT: Magmatic: Isotropic. Plagioclase glomerocrysts and acicular plagioclase grains in clinopyroxene oikocrysts with aspect ratios of 10:1.
Crystal Plastic: Patchy zones of undulose extinction in plagioclase.
Brittle: Cut by well-developed zones (curved/irregular) of localized cataclastic deformation; clast rotation (20% clast, 80% matrix).
Veins/alteration: Curved prehnite veins overprint zones of cataclasis.
Cross-cutting Relationships (as apparent in thin section):
1) Cataclasis.
2) Minor low-temperature prehnite veins cut zones of cataclasis.

PHOTOMICROGRAPHS: 345_U1415H_1R_1_TS_09.JPG
345_U1415H_1R_1_TS_09-2.JPG

THIN SECTION: **345-U1415H-1R-1-W 51/53-TSB_Piece_10-TS_10** **Thin Section no.:** **10**
Rock name: olivine-gabbro
Rock comment: weakly altered, moderate magmatic foliation
Lithologic interval: 10
Piece No.: #10 **Authors: JM, KF**
Billet request comment: IgPet: Primary Mineralogy

PRIMARY MINERALOGY **No. of Igneous domains:** 1 **Nature of ign. domains:**

Igneous domain number: 1 **Domain lithology:** olivine gabbro
Domain grain size: medium grained **Grain size distribution:** equigranular
Domain texture: granular **Relative abundance (%):** 100
Domain comment:

	Present (%)	Original (%)	Vol. repl. (%)	Size mode (mm)	Shape	Habit	Zoning	Color	Special features	Comment
Olivine	13	18	5	2.5	anhedral	irregular-amoeboid				olivine sometimes includes tabular plagioclase. Although olivine grains are very irregular in shape, their longer axes are almost parallel to the foliation due to alignment of plagioclase.
Plagioclase	63	65	2	2.5	subhedral	tabular	continuous zoning			Long axes of tabular grains are strongly aligned.
Clinopyroxene	15	17	2	3	anhedral	subequant		colorless		Some poikilitic grains contain olivine and plagioclase. Longer axes of clinopyroxene are almost parallel to the foliation due to alignment of plagioclase.
Orthopyroxene	0.2	0.2	0	1	anhedral	subequant		colorless		
Oxide	0.1	0.1	0	0.1	anhedral	equant				

ALTERATION / METAMORPHISM **No. of alteration domains:** **1** **Domain rel. abund %:** 100 **Estimated total % alteration:** 5
Alteration domain number: 1 **Domain type:** background

SECONDARY MINERALOGY	%	REPLACING / FILLING
chlorite	2.7	plagioclase 2.7%
clay minerals	1	olivine 1%
green amphibole	1	clinopyroxene 1%
oxide	0.1	olivine 0.1%
prehnite	0.3	plagioclase 0.3%
serpentine	1	olivine 1%
talc	3	olivine 3%
domain total alteration %:	**9.1**	

PRIMARY MINERAL REPLACED	% ORIGINAL	% ALTERED	REPLACEMENT MINERAL	ALTERATION COMMENTS
Olivine	20	25	clay minerals 20%, oxide 1%, serpentine 19%, talc 60%	Mesh texture with serpentine, clay and talc mainly towards the rim, but sometimes up to the core.
Plagioclase	60	5	chlorite 90%, prehnite 10%	Plagioclase altered along cracks and fractures to fine grained prehnite (?), thin rims of chlorite around plagioclase grains.
Clinopyroxene	20	5	green amphibole 100%	Clinopyroxene altered along cleavage planes.

Vein summary
vein 1 Chlorite filled fractures, crosscutting all minerals; fine grained, granular chlorite.

ALTERATION COMMENT: Very low degree of homogeneous, pervasive alteration. Pyrite occurs in association with talc/clay replacing olivine, along clinopyroxene cleavage surfaces, and in chlorite-filled fractures in plagioclase.

STRUCTURE COMMENT: Magmatic: Moderate magmatic foliation defined by plagioclase, olivine and clinopyroxene SPO, with annealed grain boundaries. Common, conspicuous deformation twins and/or bent grains of plagioclase. Tabular olivine with well-developed subgrain boundaries. Minor subgrains in plagioclase.
Crystal Plastic: No recognizable subsolidus crystal plastic deformation preserved.
Brittle: Minor fracturing; no significant brittle deformation.
Veins/alteration: Very rare irregular cracks filled with zoisite (when in plagioclase) and serpentine (when in olivine).
Cross-cutting Relationships (as apparent in thin section):
1) Magmatic foliation development, concurrent with subgrain and deformation twin formation.
2) Minor low temperature cracking and chlorite vein formation.

PHOTOMICROGRAPHS: 345_U1415H_1R_1_TS_10.JPG
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