

3. EXPLANATORY NOTES¹

Scientific Party²

INTRODUCTION

This chapter explains shipboard operations on the *Norskald* and *Aranda* to help the reader understand the ways in which the core was acquired, handled, and described. The approach follows Ocean Drilling Program (ODP) core-handling protocols as closely as possible (ODP Science Services, 2006). Some modifications, however, were necessary because of unique features of the American Petroleum Institute (API) “piggyback” wireline and seabed template system of the *Norskald* and the British Geological Survey (BGS) robotic Rockdrill used on the *Aranda*. This chapter reviews the observational criteria used by the Shipboard Scientific Party and also provides background information on specialized shipboard analytical studies (optical microscopy, X-ray fluorescence [XRF] spectrometry, and paleomagnetic measurements) and the Ocean Drilling Information (ODIN) database. Procedures for shore-based studies are described in “[Shore-Based Scientific Procedures](#),” p. 8.

SHIPBOARD SCIENTIFIC PROCEDURES

Numbering of Sites, Holes, Cores, and Samples

The drill sites are numbered consecutively and may be associated with one or more holes drilled at a specific location. A letter suffix is used to identify an individual hole drilled at a given site. For example, the first hole drilled on the Southeast Greenland (SEG) shelf is designated as Hole SEG01A, the second hole drilled at the same site is Hole SEG01B. Every hole drilled is registered in the ODIN database (see “[ODIN Database](#),” p. 9) whether or not core was recovered. This procedure differs slightly from that used by the Deep Sea Drilling Project for

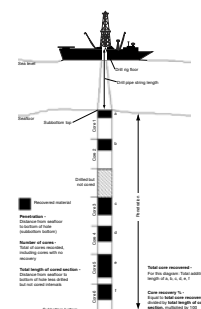
¹Examples of how to reference the whole or part of this volume.

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Dynamic positioning of the *Aranda* is controlled either using a tautwire or Differential Global Positioning System (DGPS). The DGPS was used exclusively with the BGS Rockdrill (see “Drilling from the *Aranda*” section in the **“Drilling Operations”** chapter). When using DGPS, a drill site is defined by a unique set of navigational coordinates (latitude and longitude). Under normal operations the drilling platform is not launched until the location can be confirmed using these coordinates. Once on station, the drilling platform is lowered to the seabed by the umbilical cable and winch. The location of the drill site is taken as the ship’s position at the time that the drill platform touches bottom, with a correction applied to the horizontal separation of the GPS receiver and the A-frame pulley. If the drill platform was deployed two or more times without changing the ship’s navigation coordinates, successive holes were referenced to the same site (e.g., Holes SEG01A and SEG01B). A new site was designated when the ship relocated to a new location using a new set of navigation coordinates. This scheme allowed us to return to a previously occupied site at the same navigation coordinates and continue with the alphabetical lettering of holes (e.g., the third hole drilled at Site SEG01 would be designated Hole SEG01C).

The cored interval within a hole is measured in meters below seafloor (Fig. F1). The maximum recovery from a single core barrel is 3 m of rock or sediment, but recovery was commonly less. Onboard the *Norskald*, the total length of the drill string is measured from the rig floor and corrected to sea level by subtracting the height of the rig floor above sea level. The water depth is computed by subtracting the depth below the rig floor when the sea bottom was first encountered. Similarly, when drilling from the *Aranda*, depth to the seabed is calculated from the length of cable paid out until touchdown of the Rockdrill on the seabed

F1. Coring nomenclature, p. 15.



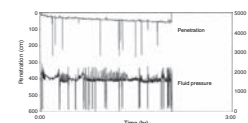
and correcting for the height of the A-frame above sea level. The drilled interval is referenced to the seabed, while the depth of the cored interval is referenced to the depth below the seabed at which coring begins. The initiation of coring is usually marked by an increase in torque on the drill bit and reduction in the rate of penetration as recorded by the drillers (see Fig. F2). We assume that advance of the drill bit to basement is through unconsolidated sediments, only parts of which may be recovered in the core barrel.

Cores taken from a hole are numbered sequentially from the upper part of the hole downward (Fig. F1). Core numbers and their associated cored intervals in meters below seafloor are usually unique for a given hole; however, this may not be true if an interval is cored twice because of caving of the walls during retraction of the drill string or other technical reasons. A recovered core is divided into ~1.0-m-long sections and placed in three-bay core boxes (Fig. F3) with the upper section of each core located in the left bay with the upper part of the section to the left. The second section is placed in the second bay with its upper part toward the top of the box. The third section is similarly oriented in the third bay. When full recovery is obtained, the sections are numbered from one to three (or higher during the 1998 cruise), with the last section possibly being shorter than 1.0 m. In cases where the recovery is not complete, the core is moved to the top of the core tray and divided as before into as many sections as necessary to accommodate the core. For example, 1.2 m of core would ideally be divided into one 1.0-m length core (referred to as Section 1) and a 0.2-m length core (referred to as Section 2) (Fig. F4). By convention, the top of the recovered core is equated with the top of the cored interval. In some cases sections <1.0 m may be cut to preserve features of interest (e.g., lithologic contacts). To save on storage space, cores collected from several holes were stored in individual bays of the same box. In some cases where only very short cores were obtained, the cores may have been stored in the same bay separated by a plywood divider.

Each piece of the core is numbered sequentially within each core section, beginning at the top of the first section. Consecutive fragments with obvious features allowing realignment are considered to be a single piece. These pieces are given the same number and lettered consecutively (e.g., 1A, 1B, and 1C). Sequentially numbered pieces may be separated by intervals of unrecovered core. Pieces in the core are located by reference to the section containing them and the positions of the top and bottom of the piece measured in centimeters from the upper part of the section. The location of a sample or piece in a core is defined by the following information: Leg, Site and Hole, Core, and Section followed by the top and bottom interval (in centimeters) and piece number. For example, 163X-SEG02A-5-2 (Piece 3, 58–60 cm) uniquely locates a specific sample in the core. The same referencing scheme, with or without the inclusion of the piece number, is used to locate any specific feature of interest in the core.

In the standard ODP sample designation protocol, a letter suffix is added to the core number to identify the type of drilling technique used (e.g., “R” for rotary coring). Because we only used diamond coring during Leg 163X, we have dropped this notation in the sample identification code.

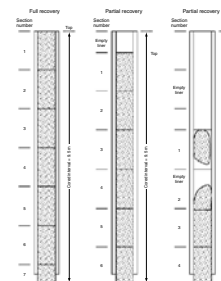
F2. Screen capture, p. 16.



F3. Core inspection, p. 17.



F4. Core handling nomenclature, p. 18.



Core Handling

When core is received on deck, details of the hole location, time of recovery, seafloor depth, and coring intervals are noted on the Core Receiving Log form (Fig. F5). This information is entered into the ODIN database (see “ODIN Database,” p. 9) to generate core box labels that are affixed to the end of the core boxes. For each piece of core, the section number and top and bottom interval of the piece (in centimeters) is recorded on the Piece Registration form (Fig. F6). This information is entered immediately into the ODIN database for printing of piece labels. The core is then split using a diamond saw into a working half and an archive half. The bottoms of oriented pieces (i.e., pieces that clearly could not have rotated top to bottom within the core barrel) are marked with a red wax pencil and cut lines are determined in order to preserve important features of the core in both halves. Cores recovered with the wireline diamond coring systems on the *Norskald* have a diameter of 56 mm and are split into equal halves. Cores recovered with the BGS Rockdrill have a diameter of 49 mm. These cores are split asymmetrically with the working half having a thickness of 30 mm to permit sampling for paleomagnetic analysis. When the recovered core is too small to split but enough material was available for paleomagnetic analysis, the complete piece is logged and stored with the working half. After splitting, the core is rinsed, dried, and placed in the working half and archive half core boxes. Piece labels are then glued to the external surface of the split core with the working half designated with a “W” and the archive half designated with an “A.” After labeling, the archive core half is packed for storage. The working core half is photographed with a digital camera before being made available for shipboard petrographic description. Sediments are handled in a similar fashion, although they are not split and the entire core is stored in the working half box. Mud and diamicton are sealed in plastic before storage.

Visual Core Description

A visual core description (VCD) form (Fig. F7) is used to describe both igneous and sedimentary lithologies for each section of core. These forms are electronically scanned and loaded into the ODIN database (see “**ODIN Database**,” p. 9). The first column on the left of the VCD form gives the piece number corresponding to the sketch of the core section in the column to the right. The graphic representation of the core indicates the shape of individual pieces, notable unit boundaries, and any internal features of merit. The column to the right of the sketch shows the orientation of each piece, if determinable. The next two columns to the right show the location of any samples taken for thin sectioning, geochemical analyzes, paleomagnetic studies, and age determinations. All samples taken from the core are recorded on the Sample Registration form (Fig. F8) and entered into the ODIN database for tracking. The third column from the left on the VCD form is used to record the location of close-up photographs and, for the 1998 cruise, the location of shipboard XRF analyses. The far right column shows the unit designations and boundaries. We assign unit numbers sequentially from top to bottom using “I” to denote igneous units, “S” to denote sedimentary units, and “C” to denote cored basalt clasts.

When igneous basement was cored, unit boundaries are identified by the occurrence of major lithologic changes (i.e., color, texture, structure, grain size, mineralogic occurrences, and abundances). Most of

F5. Core Receiving Log form, p. 19.

Log 103 X - Core Receiving Log (CRL)

Traverse # 15 Correlation Profile # 2010-1-1-3

Time	Time (min)	Depth (feet)	Latitude	Longitude	USGS 10' Grid	USGS 10' Grid	Depth (feet)	Core Name	Notes	Remarks	
2010-01-01	00:00	0	31.10121	-82.07212	16R	16R	0	103	0	OK	Recovery 100%
2010-01-01	00:01	1	31.10121	-82.07212	16R	16R	1	103	1	OK	Recovery 100%
2010-01-01	00:02	2	31.10121	-82.07212	16R	16R	2	103	2	OK	Recovery 100%
2010-01-01	00:03	3	31.10121	-82.07212	16R	16R	3	103	3	OK	Recovery 100%
2010-01-01	00:04	4	31.10121	-82.07212	16R	16R	4	103	4	OK	Recovery 100%
2010-01-01	00:05	5	31.10121	-82.07212	16R	16R	5	103	5	OK	Recovery 100%
2010-01-01	00:06	6	31.10121	-82.07212	16R	16R	6	103	6	OK	Recovery 100%
2010-01-01	00:07	7	31.10121	-82.07212	16R	16R	7	103	7	OK	Recovery 100%
2010-01-01	00:08	8	31.10121	-82.07212	16R	16R	8	103	8	OK	Recovery 100%
2010-01-01	00:09	9	31.10121	-82.07212	16R	16R	9	103	9	OK	Recovery 100%
2010-01-01	00:10	10	31.10121	-82.07212	16R	16R	10	103	10	OK	Recovery 100%
2010-01-01	00:11	11	31.10121	-82.07212	16R	16R	11	103	11	OK	Recovery 100%
2010-01-01	00:12	12	31.10121	-82.07212	16R	16R	12	103	12	OK	Recovery 100%
2010-01-01	00:13	13	31.10121	-82.07212	16R	16R	13	103	13	OK	Recovery 100%
2010-01-01	00:14	14	31.10121	-82.07212	16R	16R	14	103	14	OK	Recovery 100%
2010-01-01	00:15	15	31.10121	-82.07212	16R	16R	15	103	15	OK	Recovery 100%
2010-01-01	00:16	16	31.10121	-82.07212	16R	16R	16	103	16	OK	Recovery 100%
2010-01-01	00:17	17	31.10121	-82.07212	16R	16R	17	103	17	OK	Recovery 100%
2010-01-01	00:18	18	31.10121	-82.07212	16R	16R	18	103	18	OK	Recovery 100%
2010-01-01	00:19	19	31.10121	-82.07212	16R	16R	19	103	19	OK	Recovery 100%
2010-01-01	00:20	20	31.10121	-82.07212	16R	16R	20	103	20	OK	Recovery 100%
2010-01-01	00:21	21	31.10121	-82.07212	16R	16R	21	103	21	OK	Recovery 100%
2010-01-01	00:22	22	31.10121	-82.07212	16R	16R	22	103	22	OK	Recovery 100%
2010-01-01	00:23	23	31.10121	-82.07212	16R	16R	23	103	23	OK	Recovery 100%
2010-01-01	00:24	24	31.10121	-82.07212	16R	16R	24	103	24	OK	Recovery 100%
2010-01-01	00:25	25	31.10121	-82.07212	16R	16R	25	103	25	OK	Recovery 100%
2010-01-01	00:26	26	31.10121	-82.07212	16R	16R	26	103	26	OK	Recovery 100%
2010-01-01	00:27	27	31.10121	-82.07212	16R	16R	27	103	27	OK	Recovery 100%
2010-01-01	00:28	28	31.10121	-82.07212	16R	16R	28	103	28	OK	Recovery 100%
2010-01-01	00:29	29	31.10121	-82.07212	16R	16R	29	103	29	OK	Re

F6. Piece Registration form, p. 20.

Seq	Site	Seq	Site	Cons. (Aver)/Protein	Cons. (Aver)	Site	Cons. (Aver)
1989	2892	173	2	1.0	1.0	1	1.0
1989	2892	173	2	1.0	1.0	2	1.0
1989	2892	173	2	1.0	1.0	3	1.0
1989	2892	173	2	1.0	1.0	4	1.0
1989	2892	173	2	1.0	1.0	5	1.0
1989	2892	173	2	1.0	1.0	6	1.0
1989	2892	173	2	1.0	1.0	7	1.0
1989	2892	173	2	1.0	1.0	8	1.0
1989	2892	173	2	1.0	1.0	9	1.0
1989	2892	173	2	1.0	1.0	10	1.0
1989	2892	173	2	1.0	1.0	11	1.0
1989	2892	173	2	1.0	1.0	12	1.0
1989	2892	173	2	1.0	1.0	13	1.0
1989	2892	173	2	1.0	1.0	14	1.0
1989	2892	173	2	1.0	1.0	15	1.0
1989	2892	173	2	1.0	1.0	16	1.0
1989	2892	173	2	1.0	1.0	17	1.0
1989	2892	173	2	1.0	1.0	18	1.0
1989	2892	173	2	1.0	1.0	19	1.0
1989	2892	173	2	1.0	1.0	20	1.0
1989	2892	173	2	1.0	1.0	21	1.0
1989	2892	173	2	1.0	1.0	22	1.0
1989	2892	173	2	1.0	1.0	23	1.0
1989	2892	173	2	1.0	1.0	24	1.0
1989	2892	173	2	1.0	1.0	25	1.0
1989	2892	173	2	1.0	1.0	26	1.0
1989	2892	173	2	1.0	1.0	27	1.0
1989	2892	173	2	1.0	1.0	28	1.0
1989	2892	173	2	1.0	1.0	29	1.0
1989	2892	173	2	1.0	1.0	30	1.0
1989	2892	173	2	1.0	1.0	31	1.0
1989	2892	173	2	1.0	1.0	32	1.0
1989	2892	173	2	1.0	1.0	33	1.0
1989	2892	173	2	1.0	1.0	34	1.0
1989	2892	173	2	1.0	1.0	35	1.0
1989	2892	173	2	1.0	1.0	36	1.0
1989	2892	173	2	1.0	1.0	37	1.0
1989	2892	173	2	1.0	1.0	38	1.0
1989	2892	173	2	1.0	1.0	39	1.0
1989	2892	173	2	1.0	1.0	40	1.0
1989	2892	173	2	1.0	1.0	41	1.0
1989	2892	173	2	1.0	1.0	42	1.0
1989	2892	173	2	1.0	1.0	43	1.0
1989	2892	173	2	1.0	1.0	44	1.0
1989	2892	173	2	1.0	1.0	45	1.0
1989	2892	173	2	1.0	1.0	46	1.0
1989	2892	173	2	1.0	1.0	47	1.0
1989	2892	173	2	1.0	1.0	48	1.0
1989	2892	173	2	1.0	1.0	49	1.0
1989	2892	173	2	1.0	1.0	50	1.0
1989	2892	173	2	1.0	1.0	51	1.0
1989	2892	173					

F7. VCD form, p. 21.

[illegible]

F8. Sample Registration form,
p. 22.

Key for statistical analysis									
#0 = Phenotypic variable To: the column # = individuals number To: the row # = Sample size									
Genotype	Sex	Age	Height	Weight	Mass	Intensity	Volume	Frequency	Amplitude
00	0	1	150/160/170	0	1	1	1	1	1
00	1	1	150/160/170	0	1	1	1	1	1
00	2	1	150/160/170	0	1	1	1	1	1
00	3	1	150/160/170	0	1	1	1	1	1
00	4	1	150/160/170	0	1	1	1	1	1
00	5	1	150/160/170	0	1	1	1	1	1
00	6	1	150/160/170	0	1	1	1	1	1
00	7	1	150/160/170	0	1	1	1	1	1
00	8	1	150/160/170	0	1	1	1	1	1
00	9	1	150/160/170	0	1	1	1	1	1
00	10	1	150/160/170	0	1	1	1	1	1
00	11	1	150/160/170	0	1	1	1	1	1
00	12	1	150/160/170	0	1	1	1	1	1
00	13	1	150/160/170	0	1	1	1	1	1
00	14	1	150/160/170	0	1	1	1	1	1
00	15	1	150/160/170	0	1	1	1	1	1
00	16	1	150/160/170	0	1	1	1	1	1
00	17	1	150/160/170	0	1	1	1	1	1
00	18	1	150/160/170	0	1	1	1	1	1
00	19	1	150/160/170	0	1	1	1	1	1
00	20	1	150/160/170	0	1	1	1	1	1
00	21	1	150/160/170	0	1	1	1	1	1
00	22	1	150/160/170	0	1	1	1	1	1
00	23	1	150/160/170	0	1	1	1	1	1
00	24	1	150/160/170	0	1	1	1	1	1
00	25	1	150/160/170	0	1	1	1	1	1
00	26	1	150/160/170	0	1	1	1	1	1
00	27	1	150/160/170	0	1	1	1	1	1
00	28	1	150/160/170	0	1	1	1	1	1
00	29	1	150/160/170	0	1	1	1	1	1
00	30	1	150/160/170	0	1	1	1	1	1
00	31	1	150/160/170	0	1	1	1	1	1
00	32	1	150/160/170	0	1	1	1	1	1
00	33	1	150/160/170	0	1	1	1	1	1
00	34	1	150/160/170	0	1	1	1	1	1
00	35	1	150/160/170	0	1	1	1	1	1
00	36	1	150/160/170	0	1	1	1	1	1
00	37	1	150/160/170	0	1	1	1	1	1
00	38	1	150/160/170	0	1	1	1	1	1
00	39	1	150/160/170	0	1	1	1	1	1
00	40	1	150/160/170	0	1	1	1	1	1
00	41	1	150/160/170	0	1	1	1	1	1
00	42	1	150/160/170	0	1	1	1	1	1
00	43	1	150/160/170	0	1	1	1	1	1
00	4								

these units are cooling-rate controlled and represent individual extrusive flows, intrusive sills, or dikes. Significant primary internal variations in grain size, phenocryst type, vesiculation, or other notable features within individual units are designated as subunits using a letter suffix (e.g., 1A and 1B). Secondary features (deformation and alteration) are not considered part of the unit designation.

The presence of glaciomarine sediment of variable thickness covering much of the basement on the East Greenland shelf made drilling with the BGS seabed platform particularly challenging. Often it was necessary to maintain a high flushing rate to keep the drill bit clear during advance through the sedimentary overburden. This meant that any soft mud matrix was washed from the hole leaving a concentrate of clasts. When the matrix was not recovered it was impossible to unequivocally classify the sediment. Of importance for our work was to establish whether the fragments recovered represented basement lithologies or exotic material. To maintain objectivity, we classify all clasts as sediments ("S" units), but we further note whether the collection of rock fragments is monolithic or polythitic. If all the fragments from the core barrel are composed of lithologically identical basalt, we referred to the sediments as "basaltic gravel" and described the materials in the same way as an igneous unit. This classification proved useful for relating basalt gravel to underlying cored material, basalt gravel from other holes at the same site, or material recovered from neighboring sites. If the fragmented basalt was large enough to be cored but we are not fully certain it represented in situ basement, we applied the unit prefix "C." This material is also described using igneous unit nomenclature. The "C" designation acknowledges the tenuous nature of this fragmented material but carries with it the implication that fractured basement was probably drilled. However, we only concluded that these basaltic clasts represent the local basement lithology when indistinguishable material was recovered from adjacent holes at the same site.

Shipboard Thin Section Preparation

Thin sections were prepared on board using standard procedures. The dried rock billets (25 mm × 15 mm × 8 mm) are glued to glass plates using an Araldith epoxy and cured at 60°C. Sections are polished to a thickness of ~45 µm with a Logitech rotary lap using a mixture of ethylene glycol (to avoid sample swelling) and 15-µm alumina powder. Glass covers were omitted to permit future polishing for shorebased microprobe studies.

Igneous Rock Classification and Description

The visual description of igneous rock units was recorded on the Lithologic Unit Description form (Fig. F9) and entered into the ODIN database (see "ODIN Database," p. 9). A separate entry was made for every igneous lithologic unit of each core section. The required information falls into one of three categories: (1) summary information, (2) primary mineralogy, and (3) secondary features. The terminology used by the Shipboard Scientific Party and summarized in Table T1 is consistent with that used on ODP Legs 152 and 163.

Igneous rocks are classified according to the International Union of Geological Sciences scheme (Le Maitre, 1989), with modifiers applied to specify the phenocrystic minerals and their proportions. For example, if by visual inspection the rock contains ≤1% (by volume) phenocrysts,

F9. Lithologic Unit Description form, p. 23.

The form is titled "1999 Southwest Greenland Margin Drilling" and "Record No. 21". It contains several sections for data entry:

- Unit Name:** A field for the unit name, with "Unit 1" entered.
- Summary Information:** A section with fields for "Unit Name", "Unit Type", "Unit Color", "Unit Texture", "Unit Structure", "Unit Orientation", "Unit Alteration", and "Unit Notes".
- Primary Mineralogy:** A section with fields for "Mineralogy", "Texture", "Structure", "Orientation", "Alteration", and "Notes".
- Secondary Features:** A section with fields for "Alteration", "Notes", and "Additional Comments".

T1. VCD and thin section nomenclature, p. 27.

we precede the rock name (i.e., basalt) with the term “aphyric.” If the phenocrysts are more abundant, we used the term “phyric” preceded by the names of phenocrystic minerals, arranged in order of decreasing abundance from left to right. Finally, we denoted the overall abundance of phenocrysts by the first modifiers, where “sparsely” corresponds to 1%–2% phenocrysts, “moderately” indicates 2%–10% phenocrysts, and “highly” refers to >10% phenocrysts. Therefore, a unit classified as a sparsely plagioclase-olivine phyric basalt contains <2% (by volume) phenocrysts with plagioclase in greater abundance than olivine.

The contacts between units were identified by a significant change in phenocryst proportion and assemblage, grain size, and/or texture. The contacts may either be preserved or not preserved. The forms of the contacts are described either as planar, irregular, angular, gradational, or not preserved. The following terms are used to describe the type of contact relationship preserved: extrusive, intrusive, depositional and erosional as defined by chilled zones and contacts, intercalated volcanoclastic, volcanic and sedimentary rocks, intrusive sills and dikes, and brecciated or scoriaceous zones.

Sediment Classification and Description

Unconsolidated sediments on the East Greenland continental shelf are dominantly glaciomarine in origin and occur as overburden of variable thickness on the volcanic basement. Sites were chosen in order to minimize this sedimentary overburden. Because the diamond-bit coring system requires high flushing rates to keep the drill bit clean, the drilling strategy was designed to minimize recovery of the glaciomarine overburden. Consequently, undisturbed sedimentary units were rarely cored and recovered. Most often the soft mud matrix was washed out, leaving the coarser fractions and clasts. Given the variability in recovery, we devised a simple working classification scheme for shipboard description of the glaciomarine overburden. This classification scheme differs from the more comprehensive scheme used by ODP (e.g., Mazzullo and Graham, 1988), in that only four major types of unconsolidated material were distinguished: mud, diamicton, diamicton clasts, and basaltic gravel. We define these unconsolidated materials in the following ways:

Mud: Sediment dominated by particles ranging in grain size from clay to silt.

Diamicton: Sediment consisting of “sand and/or larger particles dispersed through a muddy matrix” (Flint et al., 1960).

Diamicton clasts: Accumulation of pebble- to cobble-sized clasts representing different rock lithologies (including petrographically distinguishable basaltic material) derived from a muddy matrix and/or sand washed from the hole.

Basaltic gravel: Accumulation of petrographically indistinguishable basaltic clasts.

The term “gravel” is used in its broadest sense to refer to a range of particle sizes from sand to pebble. Basaltic gravel may represent scree derived from mechanical weathering of the local basement or may be of unknown origin. The use of the phrase “basaltic gravel” acknowledges the sedimentary origin of the material (“S” unit) but offers the shipboard scientists the opportunity to describe the material in terms of its igneous

features. This information was very useful in site selection and evaluation.

In addition to classification of sediments using the above scheme, the size, shape, and degree of sorting of rock fragments were also recorded. We adopt the Udden-Wentworth grain-size scale convention (Table T2). The roundness and sphericity of grains and clasts are described using the descriptive terms of Powers (1953), where “roundness” is very angular, angular, subangular, subrounded, rounded, or well-rounded, and “sphericity” is either low or high. The sorting nomenclature of Folk (1974) is used (Table T3).

Thin Section Description

Thin sections prepared on board were described using the terminology for the VCDs. A glossary of common terms is provided in Table T1. Thin section descriptions were initially recorded on Thin Section Description forms (Fig. F10) and entered into the ODIN database. Among the observations are the type, proportion, size, and habit of phenocrysts, and, where recognizable, the groundmass mineralogy and grain size. The proportion of mesostasis was also estimated, along with secondary minerals and the overall state of alteration. Thin section descriptions may differ from the VCD, and no attempt was made to revise the VCD forms once thin sections became available.

X-Ray Fluorescence Analyses

Each igneous unit recovered during the *Norskald* drilling in 1998 was analyzed for selected elements by XRF on the ship using a portable X-MET 920 probe. The probe was placed directly onto the core, either on flat, cut surfaces or on rounded core surfaces. Ti, Fe, Zr, Sr, Cr, and Ni were analyzed. Single-element intensities were measured for 300 s and calibrated against a collection of 20 basalt slabs from East Greenland on which XRF major element data from the GEUS XRF laboratory in Copenhagen, Denmark (Sørensen, 1975; Kystøl and Larsen, 1999), were available (Table T4). The calibration converted major element intensities to oxide concentrations in weight percent (i.e., TiO_2 and FeO [all iron as FeO]) and trace element intensities to element concentrations in parts per million (i.e., Zr, Sr, Cr, and Ni). Calibrations used to estimate elemental concentrations from X-ray intensity are given in Table T5. Calibrations for Ni and Cr are not considered reliable. Drift was negligible as determined by repeated analysis of two East Greenland basalts (412481 and 404214). These same working standards were used to estimate analytical precision, which was found to be better than 11% for TiO_2 , 4% for FeO , 9% for Zr, and 22% for Sr. Cr and Ni are poorly determined because of an inhomogeneous distribution of Cr- and Ni-rich phases and absorption of CrK_α radiation by Ni.

Paleomagnetic Studies

Shipboard paleomagnetic studies were undertaken onboard the *Norskald* in 1998 but not onboard the *Aranda* in 1999. Natural remnant magnetization (NRM) was measured on discrete specimens (10.8 cm^3) subsampled from the working half of the core with a Molspin spinner magnetometer. The magnetic stability of selected specimens was determined by stepwise alternating-field (AF) demagnetization using a Mol-

T2. Grain-size scale, p. 29.

T3. Folk sorting scale, p. 30.

F10. Thin Section Description form, p. 24.

The image shows a 'Thin Section Description' form. It includes fields for 'Sample Number', 'Date', 'Locality', and 'Section Number'. There are also sections for 'Primary Mineralogy' and 'Secondary Mineralogy', each with a table for recording mineral types and their proportions. The form is designed for detailed recording of thin section observations.

T4. Calibration composition, p. 31.

T5. XRF sample composition, p. 32.

spin two-axis tumble demagnetizer. The AF demagnetization was performed in a stepwise manner with at least 10 steps to a maximum field of 100 mT. Both Zijderveld plots and equal-area stereographic projections were used to interpret the results. The characteristic remnant magnetization (ChRM) was isolated using principal component analysis (Kirschvink, 1980). No thermal demagnetization was performed. The results of shore-based NRM measurements for core recovered in both 1998 and 1999 are also presented in individual site chapters of this volume (see “[Shore-based Scientific Procedures](#),” p. 8).

Because the azimuth of the drill core is unknown, only the inclination and intensity of the remnance are meaningful. For each site, the inclination of the ChRM and NRM were plotted against depth and the sequence divided into magnetozones. Ideally, a magnetozone is defined by at least two successive igneous units for which the inclination clearly indicates normal/reversed polarity. The stability of NRM was confirmed by AF demagnetizations. Shifts in polarity that are observed only in single igneous units or units having intermediate inclination are ascribed to short-time geomagnetic excursions. Whenever possible, the magnetostratigraphy is combined with chemical stratigraphy for cross-correlation and as an aid for intrasite correlation. Because of the lack of other information besides the magnetic lineation of the ocean floor, a direct correlation of the magnetozones to the geomagnetic polarity timescale (Cande and Kent, 1995) is tenuous.

SHORE-BASED SCIENTIFIC PROCEDURES

A number of shore-based sample preparation procedures and analyses were performed on selected core and are included in this volume. The following sections are a summary of techniques employed.

Preparation of Powders for Geochemical Analysis

Approximately 50 g of core was crushed for geochemical analysis. All saw-cut or drilled surfaces of the core were first removed by diamond polishing. Polished samples were broken into 100-mm³ chips with weathered surfaces removed. Chips were cleaned three to four times in an ultrasonic bath of distilled water and dried at 110°C. Cleaned chips were powdered in a ceramic (Al₂O₃) SPEX shatterbox. For each sample, the ceramic inner liner was first cleaned with quartz sand, rinsed, and dried. The inner liner was then precontaminated by powdering approximately equal parts quartz sand and sample, totaling 25 g, rinsed, and dried. A total of 25 g of sample was finally pulverized to a fine powder.

X-Ray Fluorescence Analyses

Sample powders were analyzed by XRF for major and minor elements (Si, Ti, Al, Fe, Mn, Mg, Ca, K, and P) and selected trace elements (V, Cr, Ni, Cu, Zn, Sr, and Zr) using glass discs at the GEUS laboratory in Copenhagen. Sodium was determined by atomic absorption, and the ferrous iron content determined by titration. Details of the GEUS standard analytical procedures are provided in Sørensen (1975) and Kystøl and Larsen (1999). Representative data are presented in the individual site chapters. All analytical results are given in “[Appendix A](#),” p. 12.

Microprobe Analyses

Mineral compositions were determined in polished thin sections using the University of California, Davis, Cameca SX-50 electron microprobe operating at an acceleration voltage of 15 kV and a beam current of 10 nA. All phases were analyzed with a ~1-mm-diameter beam and counting time of 10 s using natural mineral standardizations. Data tables are presented in “Appendix B,” p. 13.

Point Counting

All thin sections were point-counted postcruise using an automated Swift stage mounted to an Olympus petrographic microscope. A total of 2000 points were accumulated for each thin section at a spacing of 0.02 mm × 0.5 mm and 25×–50× magnification. Tabulation of these results is provided in “Appendix C,” p. 14.

Paleomagnetic Studies

The procedures for the onshore studies were identical to the shipboard studies (see “Shipboard Scientific Procedures,” p. 1), with the exception that the measurements were determined using a 2G superconducting quantum interference device magnetometer and a 2G automatic, three-axis AF demagnetizer.

ODIN DATABASE

All information relevant to drilling operations and results on Leg 163X is compiled in the ODIN database developed by the Shipboard Scientific Party specifically for the cruise using FileMaker Pro operating under MacOS. ODIN is organized to conform as closely as possible to standard ODP core and sample handling procedures with provisions for including technical information about the drilling, navigation coordinates, VCDs, core photographs, thin section descriptions, chemical analyses, and paleomagnetic data. The database is fully integrated and searchable, allowing easy entry of descriptive and numerical information, as well as digital core and close-up photographs.

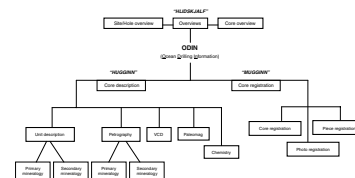
By more than coincidence, the acronym ODIN also refers to the chief Norse god, *Odin* (Fig. F11). *Odin* “...could remember everything that had ever happened and he knew everything that was going to happen. He had drunk from the spring of wisdom before it dried up, and at the dawn of time he had pledged an eye in exchange for all the wisdom in the world. But with his one eye he could see more than all the others. Right at the top of his castle, Valhalla, he had a lookout seat called *Hlid-skjalf*, which was hewn into the loftiest mountain peak in Asgard; from there he could see the whole world and keep an eye on the giants. And what he couldn’t see he heard about: he had two ravens, *Huginn* and *Muginn*, who were for ever flying round the world and coming back to whisper what they had heard in his ear...” (Sørensen, 1982, translated by P. Hostrup-Jessen).

This story of *Odin* provides an introduction to the principal elements of the ODIN database (Fig. F12). MUGINN is used to enter all drilling and navigational information for sites and holes in addition to registering the core, pieces of the core, and digital photographs. HUGINN contains all descriptive information about the core and is fully searchable.

F11. *Odin*, p. 25.



F12. Database structure, p. 26.



HLIDSKJALF provides a comprehensive overview of sites, holes, and recovered core and is the first entry point for most search operations. Table T6 provides an outline of the main functions of ODIN and the links between various components of the database.

T6. Database summary, p. 33.

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APPENDIX A

See Table [AT1](#) for shipboard analyses data of major and trace elements.

[AT1](#). XRF analyses, p. 34.

APPENDIX B

See Tables [AT2](#), [AT3](#), [AT4](#), and [AT5](#) for microprobe analyses of selected plagioclase, augite, olivine, and chromian spinel phenocrysts.

[AT2](#). Plagioclase phenocrysts, p. 38.

[AT3](#). Augite phenocrysts, p. 42.

[AT4](#). Olivine phenocrysts, p. 47.

[AT5](#). Chromian spinel phenocrysts, p. 48.

APPENDIX C

See Table AT6 for point-counted modal analyses of lavas.

AT6. Modal analyses, p. 49.

Figure F1. Schematic illustration of nomenclature used in coring operations and core recovery (modified from Shipboard Scientific Party, 1999).

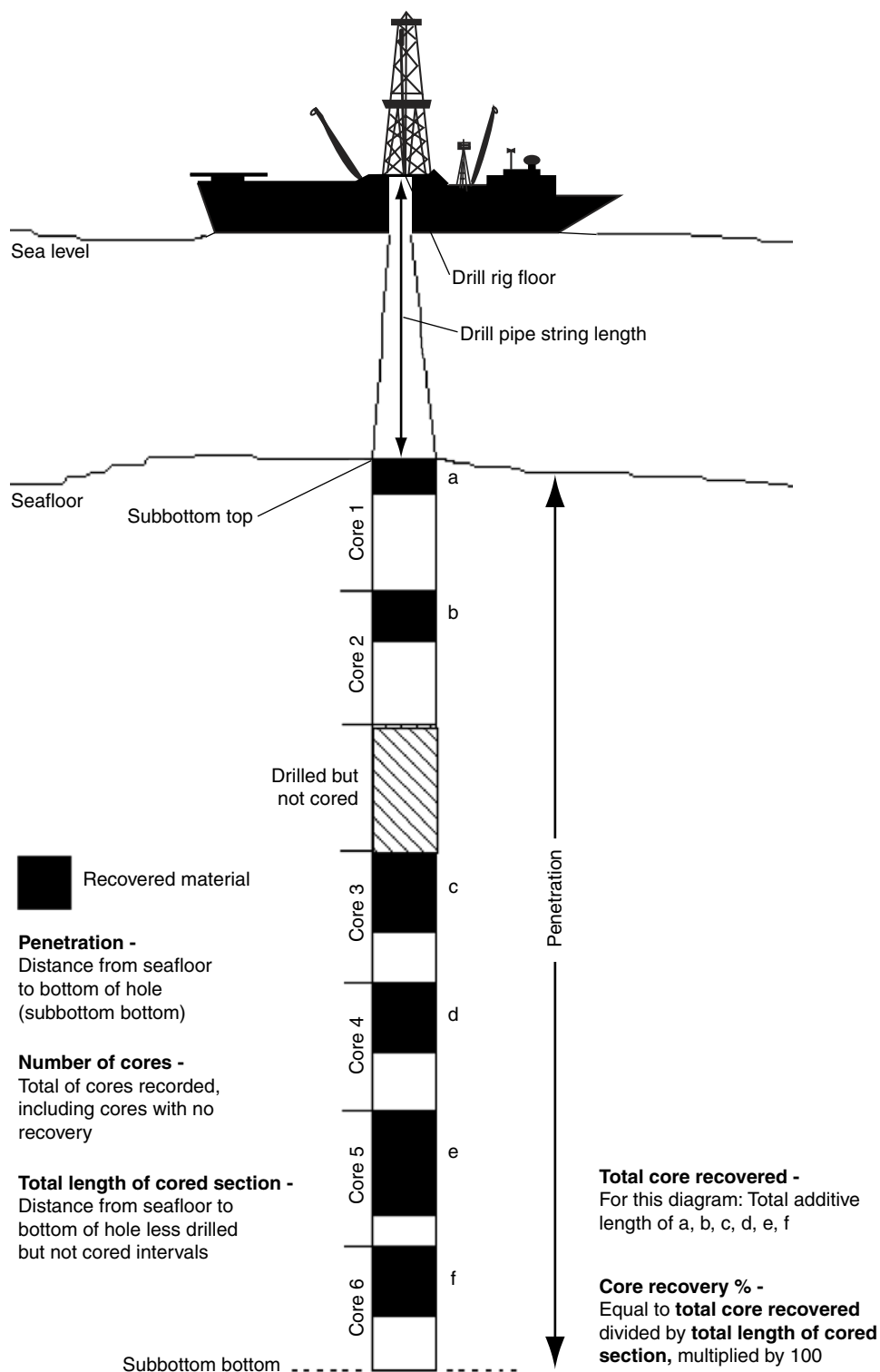


Figure F2. Example of drilling conditions for Hole SEG62A using the British Geological Survey's Rockdrill showing penetration and fluid pressure vs. time using a surface stepped-profile diamond bit and Tasiilaq insert. Rapid penetration to 0.42 m in sedimentary overburden was followed by steady penetration in volcanic basement with frequent stalling to 0.94 m, where no further progress was possible.

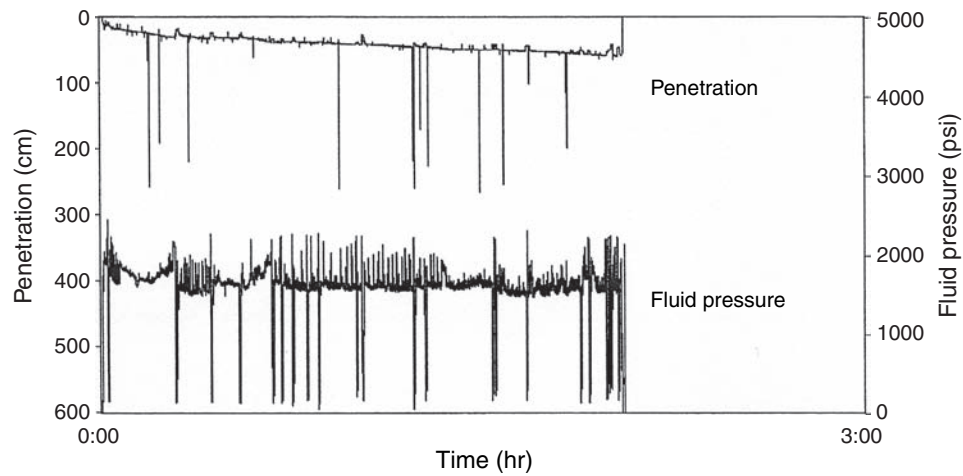
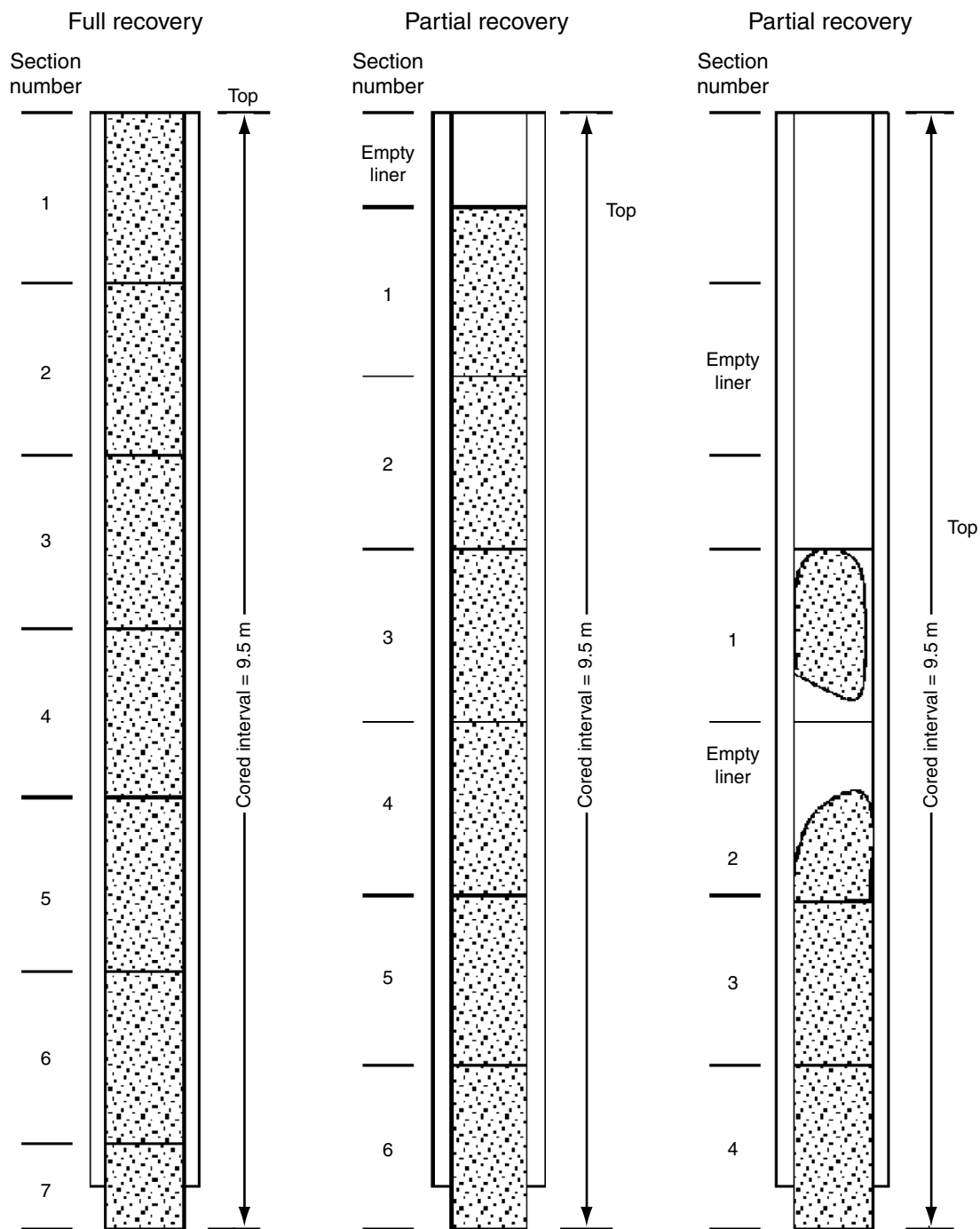


Figure F3. Shipboard Scientific Party inspecting core in three-bay core box prior to splitting.



Figure F4. Nomenclature used for core handling (modified after Shipboard Scientific Party, 1999).



[illegible]

Piece Registration

Key for shipboard samples

TS: Thin section

D: Sample for dating

[illegible]

Figure F9. Example of a completed Lithologic Unit Description form.

1999 Southeast Greenland Margin Drilling **Record No.** 73

Date: _____
Observer's initials: up

Leg	Site	Hole	Core	Section	Interval		Unit No.
					Top (cm)	Bottom (cm)	
163X	SEG-26	A	1	1	0	to 92	I-1

1. Summary Information

Rock name: Moderately Clinopyroxene-Plagioclase Phyric Basalt

Color: light grey

Structure/Flow Morphology: massive

Grain Size: fine-grained

Texture: porphyritic, glomeroporphyritic, amygdaloidal

State of Alteration: moderately

2. Primary Mineralogy

Phenocrysts	abundance (%)	avg. size (mm)	shape	% alteration	comments
<u>Olivine</u>					
<u>Plagioclase</u>	<u>2</u>	<u>1</u>	<u>subhedral</u>	<u>-</u>	<u>In glomerocrysts with cpx</u>
<u>Clinopyroxene</u>	<u>5</u>	<u>1-2</u>	<u>sub-euhedral</u>	<u>30</u>	<u>Discrete and in glomerocrysts</u>
		<u>1</u>			

Groundmass mineralogy and texture: Intergranular and mainly clinopyroxene and plagioclase

3. Secondary Features

Vesicles/miaroles: Vesicles sizes are 1-5mm and are filled by a white material

Structure: _____

Alteration: _____

Veins/fractures: Veins are less than 1mm wide and filled with white minerals. Most fractures are at right angles to core length.

4. Additional comments:

Figure F10. Example of a completed Thin Section Description form.

Observer's initials: *MP*

Date: *05-09-99*

Leg	Site	Hole	Core	Section	Interval			Piece No.
					Top		Bottom	
163x	SEG-26	A	1	1	85	10	89	69

1. Summary Information

Unit number: *I-1* Where Sampled: *representative*

Rock name: *Moderately Plagioclase-Clinopyroxene Phyric Basalt*

Texture: *porphyritic, glomeroporphyritic, seriate, vesicular, amygdaloidal*

Grain Size: *fine-grained*

2. Primary Mineralogy

Phenocrysts	Present (%)	Original (%)	Size range (mm)	Approx. Comp.	Morphology	Comments (include alteration)
<i>Olivine</i>						
<i>Plagioclase</i>	<i>7</i>	<i>7</i>	<i>2</i>		<i>euhedral-subhedral</i>	<i>slightly altered in places</i>
<i>Clinopyroxene</i>	<i>1</i>	<i>1</i>	<i>0.5</i>	<i>augite</i>	<i>euhedral-anhedral</i>	<i>twinned</i>
Groundmass						
<i>Olivine</i>						
<i>Plagioclase</i>	<i>49</i>	<i>49</i>	<i><0.1-1</i>		<i>laths</i>	
<i>Clinopyroxene</i>	<i>40</i>	<i>40</i>	<i><0.01-0.5</i>		<i>subhedral</i>	
<i>Mesostasis</i>						
<i>oxide</i>	<i>2</i>	<i>2</i>				

3. Secondary Mineralogy

Phase	Present (%)	Replacing/Filling	Comments (mineral association/distribution/size range/morphology, etc.)
<i>unidentified</i>	<i>1</i>	<i>vesicles</i>	
Total	100	<-sum of 2 & 3 must total 100	

4. Vesicles/cavities/veins/fractures: *Vesicles are unfilled, round and about 1 mm in diameter. A few vesicles are filled with calcite, prismatic zeolite, and a yellowish brown, strongly pleochroic mineral with one very good cleavage. The groundmass and phenocrysts are partially replaced by greenish, brown, orange brown, and dark brown clays.*

5. Additional comments:

Groundmass is relatively fresh with an intergranular to moderately intersertal texture.

Thin Section Description

Figure F11. *Odin*, the chief Norse god, riding his eight-legged horse, *Sleipnir*, and accompanied by *Huginn* and *Muginn*.



Figure F12. Structure of the ODIN database. VCD = visual core description.

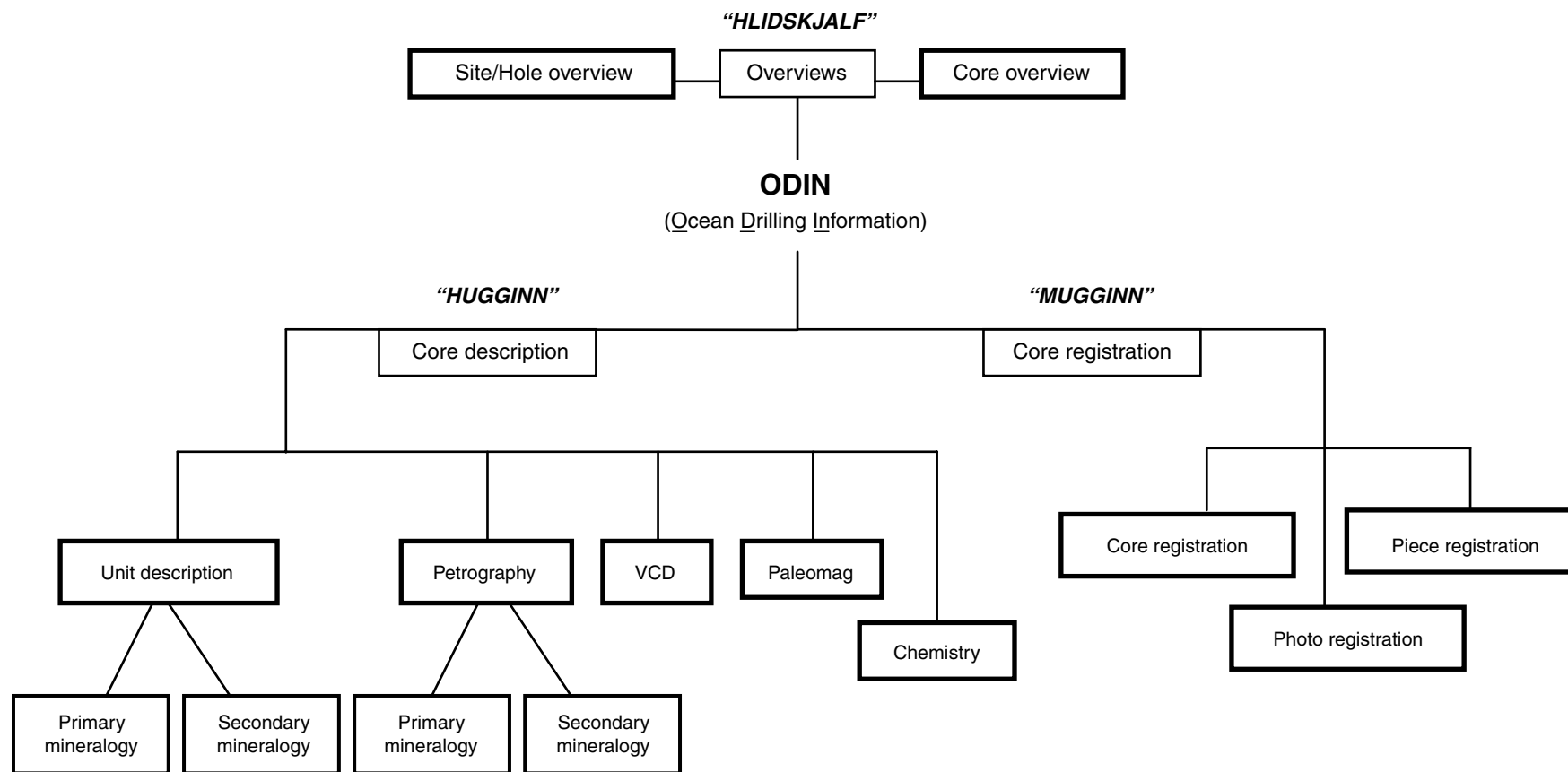


Table T1. Nomenclature used for visual core and thin section descriptions of igneous units. (Continued on next page.)

Rock name		
Basalt	Plagioclase, clinopyroxene, <5% olivine, Fe-Ti oxides in groundmass	
Olivine-basalt	5%–20% olivine, clinopyroxene, plagioclase, Fe-Ti oxides in groundmass	
Andesite	<50% anorthite in plagioclase, clinopyroxene, Fe-Ti oxides, little or no olivine	
Dacite		
Rhyolite		
Volcanic ash		
Scoria		
Breccia		
Hyaloclastite		
Rock name modifiers		
Modifier 1	Sparsely	1%–2% phenocrysts
	Moderately	2%–10% phenocrysts
	Highly	>10% phenocrysts
Modifier 2	List of phenocryst assemblage in order of decreasing abundance	
	For example:	
	Olivine Olivine-plagioclase Olivine-plagioclase-clinopyroxene	
Modifier 3	Aphyric	≤1% phenocrysts
	Phyric	>1% phenocrysts
	Use aphyric basalt for plagioclase and pyroxene in groundmass and aphyric olivine-basalt when olivine (or alteration after olivine) is present in groundmass.	
For example, a moderately olivine-plagioclase phyric basalt contains 2%–10% phenocrysts with olivine in greater abundance than plagioclase.		
Color (dry surface)		
For example, black, dark gray, gray, or light gray.		
Flow morphology/structure		
Massive		
Pillow lava		
Inflation flow		
Sheet flow		
Hyaloclastite		
Aa flow		
Pahoehoe flow		
Breccia		
Dike		
Sill		
Grain size		
Glassy		
Cryptocrystalline		
Microcrystalline		
Fine grained	<1 mm	
Medium grained	1–5 mm	
Coarse grained	>5 mm	
Texture		
Macroscopic (unit description)		
Glomeroporphyritic	Clusters of crystals (mostly plagioclase with minor clinopyroxene and olivine) in a finer grained matrix	
Sperulitic	Microlitic often radiating grains in a glass (often chilled margin)	
Trachytic	Flow lamination shown by aligned plagioclase crystals	
Vesicular	Open cavities formed by gas bubbles	
Porphyritic	Large crystals of early crystallized phases in a fine-grained matrix	
Microscopic (thin section descriptions)		
Granular	Equant grains	
Poikilitic	Early phase (e.g., plagioclase) enclosed in later phase (e.g., clinopyroxene)	
Ophitic	Plagioclase laths enclosed in clinopyroxene	
Subophitic	Partly ophitic	
Mottled		
Granophytic		
Graphic		
Micrographic		
Seriate	Large grain-size variations	
Intersertal	With interstitial glass	
Intergranular		

Table T1 (continued).

Alteration	
Fresh	<2%
Slightly	2%–10%
Moderately	10%–40%
Highly	40%–80%
Very highly	80%–95%
Completely	>95%

Table T2. Udden-Wentworth grain-size scale.

Particle type	Diameter (mm)
Boulder	>256
Cobble	256–32
Pebble	32–4
Granule	4–2
Coarse sand	2–0.5
Medium sand	0.5–0.25
Fine sand	0.25–0.0625
Silt	0.0625–0.0039
Clay	<0.0039

Table T3. Folk sorting scale.

Degree of sorting	ϕ value
Very well sorted	0–0.35
Well sorted	0.35–0.50
Moderately well sorted	0.50–0.71
Moderately sorted	0.71–1.00
Poorly sorted	1.00–2.00
Very poorly sorted	2.00–4.00
Extremely poorly sorted	>4.00

Table T4. Composition of samples used for calibration of shipboard XRF analyses.

Sample	Element oxides (wt%)		Trace elements (ppm)			
	TiO ₂	FeO	Zr	Cr	Ni	Sr
83820	0.87	10.24	43	691	346	77
83837	4.07	15.08	281	43	69	221
83888	2.34	12.64	162	178	88	235
83889	1.12	11.6	61	166	84	101
83883	5.13	15.45	346	106	78	303
412481	2.98	15.24	174	74	66	195
412493	1.24	11.72	64	158	94	124
437171	2.38	12.87	137	100	84	241
83834	0.68	9.59	34	976	628	55
83839	0.89	9.98	44	486	203	102
83877	4.75	14.54	320	178	93	284
83893	1.58	13.8	83	72	63	89
412422	3.46	15.28	248	84	61	241
404208	1.82	11.15	125	504	252	218
404210	1.78	8.82	133	505	122	244
404211	0.9	12.32	67	926	1061	13
404214	1.18	12.42	85	1533	920	112
404217	1.02	11.97	71	1663	913	38
404262	0.99	9.72	46	383	158	74
404175	2.43	11.23	175	234	101	291

Note: TiO₂ and FeO (total Fe) are conventional X-ray fluorescence (XRF) analyses (GEUS XRF laboratory, Copenhagen, Denmark). Zr, Cr, Ni and Sr are ICP-MS analyses (Oregon State University, USA), except for Zr concentrations in samples 83837, 83883, and 83877, which are XRF analyses from the GEUS laboratory.

Table T5. Calibration of shipboard XRF analyses.

Element	Regression	Comments
TiO ₂	$-0.308 + 0.159 \times I_{Ti}$	20 points of 20, $S = 0.201$, $R = 0.989$, $F = 839.907$
FeO	$-3.15 - (2.34 \times 10^5) \times I_{Fe} \times I_{Fe} + 27 \times (I_{Fe}/BS)$	20 points of 20, $S = 0.637$, $R = 0.957$, $F = 92.740$
Zr	$24.6 + 26.5 \times I_{Zr}$	20 points of 20, $S = 14.832$, $R = 0.989$, $F = 782.506$
Sr	$22 + 32.7 \times I_{Sr}$	20 points of 20, $S = 10.801$, $R = 0.994$, $F = 1389.538$
Cr	$247 + 4.61 \times I_{Cr} \times I_{Ni}$	15 points of 20, $S = 218.089$, $R = 0.915$, $F = 66.422$
Ni	$112 + 3.44 \times I_{Ni} \times I_{Cr}$	15 points of 20, $S = 76.950$, $R = 0.979$, $F = 296.716$

Notes: TiO₂ and FeO in weight percent, all other elements in parts per million. I_n = X-ray intensity of element n, B_s = intensity of backscattered electrons, S = standard error of the fit calculated as the root of the mean square error, R = coefficient of correlation, F = sum of squares divided by S for the given regression.

Table T6. Summary of ODIN database functions and direct links among data sets.

Data set	Main functions	Important links
Core registration	Register core with correct identification numbers, detail of drilling operations and techniques, and storage information	Core photo registration Piece registration Drill log Hole overview
Piece registration	Each piece of core recovered is registered	Core registration Core photo registration
Photo registration	Photos of the core box and sections within core box are registered	Core registration Piece registration
Lithologic unit description	Defined unit is described	Visual core description Core overview Core registration
Visual core description	Drawn visual core outline (VCD) and scanned image of the core is entered	Unit description Core overview Hole overview Core registration
Petrography (thin section description)	Detailed petrographic descriptions	Core overview Unit description
Geochemistry	Geochemical analysis	Core overview Unit description
Paleomagnetism	Data from paleomagnetic analysis	Core overview Unit description
Site/hole overview	Summarizing and linking site/hole results	Core overview Core registration
Core overview	Summarizing and linking core results	Hole overview Core registration

Table AT1. Shore-based XRF analyses of major and trace elements. (See table note. Continued on next three pages.)

Hole, core, section, interval (cm)	Lab ID	Job number	Date	Major element oxides (wt%)												Total
				SiO ₂	TiO ₂	Al ₂ O ₃	Fe ₂ O ₃	FeO	MnO	MgO	CaO	Na ₂ O	K ₂ O	P ₂ O ₅	LOI	
163X-																
SEG01A-1-1, 57–61–	01A11	JOB702	15 Sep 1998	47.52	2.33	14.26	4.07	9.40	0.22	6.45	11.50	2.77	0.15	0.21	1.35	100.21
SEG01A-2-1, 62–66	0A121			46.95	2.32	14.29	3.58	9.59	0.22	6.48	10.86	2.91	0.33	0.20	2.11	99.84
SEG02A-6-1, 29–34	02A61			47.04	3.57	14.17	6.93	8.54	0.26	4.62	8.38	3.43	0.95	0.44	1.31	99.63
SEG02A-7-1, 46–50	02A71	JOB858	26 Nov 1999	46.97	3.41	14.74	6.59	8.22	0.29	5.16	8.69	3.39	0.65	0.41	1.44	99.97
SEG04B-1-1 (Piece 6, 60–68)	04B1A			46.77	1.90	14.68	5.26	5.96	0.21	7.93	11.16	2.34	0.18	0.18	2.86	99.43
SEG05B-1-1 (Piece 3B, 39–47)	05B1A			47.38	1.95	17.75	4.53	5.68	0.19	5.58	12.09	2.59	0.38	0.22	1.33	99.66
SEG10B-1-1 (Piece 2C, 94–103)	10B1A			48.37	2.20	13.76	3.91	8.49	0.20	5.94	10.88	2.77	0.33	0.23	2.32	99.40
SEG11A-1-1 (Piece 2, 11–19)	11A1A			48.60	2.09	14.87	2.95	9.30	0.21	5.85	11.43	2.69	0.30	0.24	1.08	99.59
SEG12A-1-1 (Piece 1A, 0–7)	12A1A			48.35	2.44	14.37	5.11	7.44	0.19	5.22	10.20	3.06	0.60	0.25	2.60	99.83
SEG21D-1-1 (Piece 1A, 9–18)	21D1A			46.86	3.08	13.48	5.48	8.61	0.21	6.29	10.61	2.82	0.30	0.31	1.43	99.49
SEG22A-1-1 (Piece 3A, 15–22)	22A1A			46.76	3.31	13.62	5.97	8.30	0.21	6.12	10.62	2.86	0.32	0.33	1.33	99.73
SEG24A-1-1 (Piece 2, 4–12)	24A1A			48.17	1.61	14.66	4.29	7.19	0.19	7.81	11.60	2.26	0.23	0.14	1.41	99.56
SEG26A-1-1 (Piece 6G, 85–92)	26A1A			48.57	2.03	15.32	4.48	7.66	0.19	6.75	10.74	2.60	0.40	0.18	1.15	100.05
SEG27A-1-1 (Piece 5A, 47–54)	27A1A			48.59	1.94	15.39	4.02	7.75	0.18	6.55	11.20	2.53	0.21	0.17	0.87	99.40
SEG28A-1-1 (Piece 5, 28–39)	28A1A			46.53	2.04	14.62	5.09	8.14	0.21	6.72	10.27	2.75	0.37	0.18	2.45	99.37
SEG29A-1-1 (Piece 4B, 26–34)	29A1A			47.38	2.30	14.71	5.94	7.19	0.19	6.94	10.11	2.61	0.34	0.20	1.74	99.64
SEG31A-1-1 (Piece 1E, 61–68)	31A1A			46.87	2.40	14.98	4.72	8.26	0.20	7.02	10.32	2.46	0.22	0.21	1.90	99.55
SEG36A-1-1 (Piece 2B, 11–19)	36A1A			46.45	2.20	13.41	6.86	5.72	0.20	9.04	10.72	2.36	0.19	0.22	2.26	99.61
SEG40A-1-2 (Piece 1, 4–14)	40A2A			47.27	0.83	14.35	5.58	4.94	0.17	11.07	11.38	1.62	0.10	0.06	2.38	99.75
SEG41A-1-1 (Piece 1C, 16–23)	41A1A			48.69	1.89	14.52	4.39	8.20	0.20	6.78	11.20	2.43	0.19	0.18	0.87	99.54
SEG42C-1-1 (Piece 5, 41–48)	42C1A			46.85	0.76	16.53	4.87	4.30	0.16	9.84	12.32	1.47	0.12	0.07	2.66	99.94
SEG43A-1-1 (Piece 4, 11–18)	43A1A			45.69	0.74	16.32	5.19	4.40	0.15	10.81	11.18	1.59	0.11	0.06	3.31	99.55
SEG44A-1-1 (Piece 1B, 38–46)	44A1A			48.57	2.27	14.06	4.06	7.53	0.19	7.44	11.79	2.48	0.22	0.23	0.90	99.73
SEG45A-1-1 (Piece 6, 45–49)	45A1A			47.48	1.20	14.75	6.20	6.16	0.19	8.43	10.59	2.12	0.19	0.10	2.49	99.88
SEG47A-1-1 (Piece 9, 66–74)	47A1A			47.05	2.24	13.96	4.48	7.28	0.19	7.73	11.00	2.75	0.38	0.22	2.53	99.80
SEG51C-1-1 (Piece 6, 25–32)	51C1A			47.32	3.14	14.12	11.26	3.36	0.17	4.94	8.88	3.83	1.17	0.43	1.45	100.07
SEG52A-1-1 (Piece 2B, 13–20)	52A1A			47.26	2.81	13.99	8.45	6.17	0.21	5.79	10.80	2.96	0.40	0.29	0.92	100.06
SEG53B-1-1 (Piece 2, 4–11.5)	53B1A			47.55	2.17	14.68	6.56	6.35	0.21	6.59	11.24	2.82	0.39	0.23	1.07	99.85
SEG54A-1-1 (Piece 3, 14–21)	54A1A			47.93	2.64	14.05	6.03	7.54	0.22	5.93	11.06	2.92	0.54	0.29	0.75	99.90
SEG55B-1-1 (Piece 4, 27–32)	55B1A			47.51	2.98	14.04	5.29	7.64	0.21	6.82	10.54	2.91	0.20	0.28	1.07	99.49
SEG56A-1-1 (Piece 4, 14–22)	56A1A			46.35	2.56	14.57	4.81	8.64	0.21	6.61	10.25	3.01	0.40	0.22	1.93	99.57
SEG57A-1-1 (Piece 5, 15–22)	57A1A			44.72	3.58	13.77	7.66	7.23	0.22	6.24	10.30	3.05	0.81	0.44	1.55	99.56
SEG58A-1-1 (Piece 1C, 9–16)	58A1A			47.83	2.81	15.11	5.12	8.27	0.19	5.25	10.50	2.71	0.60	0.31	0.98	99.67
SEG60B-1-1 (Piece 6A, 90–97)	60B1A			44.53	3.91	13.82	7.90	7.34	0.22	6.61	9.39	2.45	0.44	0.37	2.63	99.61
SEG61B-1-1 (Piece 1B, 16–23)	61B1A			45.68	2.65	14.27	4.35	8.46	0.20	6.98	10.54	2.93	0.51	0.25	2.62	99.43
SEG61B-1-1 (Piece 8, 95–102)	61B1B			46.61	2.68	14.38	6.20	6.91	0.20	7.05	10.90	2.72	0.30	0.25	1.55	99.74
SEG62A-1-1 (Piece 2, 13–20)	62A1A			46.01	3.04	14.58	5.66	8.07	0.21	6.65	10.28	2.96	0.41	0.29	1.76	99.91
SEG63A-1-1 (Piece 3, 18–25)	63A1A			46.09	2.58	14.54	8.61	5.06	0.20	6.36	11.19	2.82	0.65	0.30	1.48	99.88
SEG63A-1-1 (Piece 3, 18–25)	63A1B			46.43	2.66	14.49	7.12	6.15	0.19	6.45	11.16	2.90	0.61	0.29	1.15	99.60
SEG64B-1-1 (Piece 1, 0–8)	64B1A			46.50	3.67	13.47	3.69	10.90	0.23	6.44	10.62	2.67	0.53	0.40	0.81	99.92
SEG65B-1-1 (Piece 4, 23–29)	65B1A			47.06	2.14	14.67	5.54	6.48	0.19	6.97	12.04	2.66	0.44	0.24	1.37	99.79
SEG70A-1-1 (Piece 6D, 59–66)	70A1A			48.37	1.94	15.17	4.15	8.36	0.20	6.35	11.40	2.44	0.15	0.18	1.04	99.75
SEG71A-1-1 (Piece 2C, 28.5–32.5)	71A1A			49.09	2.04	14.04	3.87	8.75	0.21	6.29	11.41	2.51	0.29	0.18	0.87	99.55
SEG76A-1-1 (Piece 2B, 6.5–11)	76A1A			48.03	2.57	12.96	7.23	6.71	0.27	6.51	9.73	3.35	0.37	0.24	1.67	99.62
SEG77A-1-1 (Piece 3, 19–26)	77A1A			43.92	2.23	12.64	10.55	3.03	0.19	11.28	9.19	1.78	0.58	0.16	3.87	99.41
SEG04A-1-1 (Piece 6A, 44–45)	04A1A	JOB892	25 Aug 2000	48.39	1.96	14.33	6.98	4.72	0.15	6.94	10.99	2.54	0.37	0.18	2.01	99.55
SEG05D-1-1 (Piece 3, 53–57)	05D1A			48.24	2.44	15.84	4.80	6.99	0.17	5.57	10.79	2.87	0.65	0.29	1.19	99.82

Table AT1 (continued).

Hole, core, section, interval (cm)	Lab ID	Job number	Date	Trace elements (ppm)														
				V	Cr	Ni	Cu	Zn	Rb	Sr	Y	Zr	Nb	Ba	La	Ce	Total	Total (wt%)
163X-																		
SEG01A-1-1, 57–61–	01A11	JOB702	15 Sep 1998	399	88	80	165	143	2	204	99	170	42	110	46	35	1583	100.37
SEG01A-2-1, 62–66	0A121			388	87	111	238	135	0	225	91	158	0	91	42	0	1567	99.99
SEG02A-6-1, 29–34	02A61			483	22	37	337	197	16	254	119	306	58	283	23	94	2228	99.85
SEG02A-7-1, 46–50	02A71			465	45	34	219	187	11	256	112	287	56	244	57	67	2040	100.17
SEG04B-1-1 (Piece 6, 60–68)	04B1A	JOB858	26 Nov 1999	367	311	68	118	67	22	162	60	139	26	0	89	0	1429	99.57
SEG05B-1-1 (Piece 3B, 39–47)	05B1A			291	91	32	84	62	25	338	50	135	32	0	93	0	1233	99.79
SEG10B-1-1 (Piece 2C, 94–103)	10B1A			377	62	27	217	85	25	198	71	158	34	0	65	0	1319	99.53
SEG11A-1-1 (Piece 2, 11–19)	11A1A			356	81	35	193	78	37	234	71	171	38	45	96	0	1435	99.73
SEG12A-1-1 (Piece 1A, 0–7)	12A1A			358	26	10	138	91	34	295	68	180	36	69	103	0	1408	99.98
SEG21D-1-1 (Piece 1A, 9–18)	21D1A			401	166	70	388	93	35	250	84	234	47	0	104	0	1872	99.67
SEG22A-1-1 (Piece 3A, 15–22)	22A1A			410	174	67	335	97	37	254	91	245	50	0	99	0	1859	99.92
SEG24A-1-1 (Piece 2, 4–12)	24A1A			322	265	73	161	56	24	175	51	120	23	0	86	0	1356	99.69
SEG26A-1-1 (Piece 6C, 85–92)	26A1A			363	198	73	201	71	26	206	60	150	29	0	80	0	1457	100.19
SEG27A-1-1 (Piece 5A, 47–54)	27A1A			353	197	72	179	73	23	212	54	137	24	0	118	0	1442	99.54
SEG28A-1-1 (Piece 5, 28–39)	28A1A			382	177	67	248	81	25	317	62	149	29	0	72	0	1609	99.53
SEG29A-1-1 (Piece 4B, 26–34)	29A1A			385	163	74	198	78	33	231	69	175	30	133	38	0	1607	99.80
SEG31A-1-1 (Piece 1E, 61–68)	31A1A			385	179	71	213	84	25	241	67	167	30	18	91	0	1571	99.71
SEG36A-1-1 (Piece 2B, 11–19)	36A1A			421	521	280	107	66	28	229	66	152	28	0	191	0	2089	99.82
SEG40A-1-2 (Piece 1, 4–14)	40A2A			280	927	385	162	39	17	55	46	69	13	0	91	0	2084	99.96
SEG41A-1-1 (Piece 1C, 16–23)	41A1A			395	117	84	219	67	25	173	63	141	27	0	206	12	1529	99.69
SEG42C-1-1 (Piece 5, 41–48)	42C1A			251	489	204	98	16	24	74	40	72	13	0	130	0	1411	100.08
SEG43A-1-1 (Piece 4, 11–18)	43A1A			217	652	349	110	28	15	70	30	58	8	0	70	0	1607	99.72
SEG44A-1-1 (Piece 1B, 38–46)	44A1A			317	298	103	151	61	30	274	66	168	32	0	125	0	1625	99.89
SEG45A-1-1 (Piece 6, 45–49)	45A1A			327	379	91	161	41	28	81	64	104	22	0	47	0	1345	100.02
SEG47A-1-1 (Piece 9, 66–74)	47A1A			326	315	98	114	64	25	280	64	161	29	0	108	0	1584	99.96
SEG51C-1-1 (Piece 6, 25–32)	51C1A			349	46	39	127	102	54	564	80	279	60	226	104	18	2048	100.27
SEG52A-1-1 (Piece 2B, 13–20)	52A1A			437	37	29	193	87	40	321	88	222	46	108	92	0	1700	100.23
SEG53B-1-1 (Piece 2, 4–11.5)	53B1A			382	117	56	247	69	35	264	71	178	37	60	116	0	1632	100.01
SEG54A-1-1 (Piece 3, 14–21)	54A1A			431	61	44	221	78	41	289	82	213	42	24	78	0	1604	100.06
SEG55B-1-1 (Piece 4, 27–32)	55B1A			422	188	83	247	90	33	259	78	216	37	0	88	0	1741	99.66
SEG56A-1-1 (Piece 4, 14–22)	56A1A			365	117	69	190	95	29	317	71	182	35	0	136	0	1606	99.73
SEG57A-1-1 (Piece 5, 15–22)	57A1A			441	56	58	223	87	51	528	85	219	54	207	91	5	2105	99.77
SEG58A-1-1 (Piece 1C, 9–16)	58A1A			335	92	54	260	90	41	295	81	235	42	15	76	0	1616	99.83
SEG60B-1-1 (Piece 6A, 90–97)	60B1A			464	146	74	317	105	43	269	95	284	54	76	63	0	1990	99.81
SEG61B-1-1 (Piece 1B, 16–23)	61B1A			351	166	88	203	79	30	401	67	184	36	0	65	0	1670	99.60
SEG61B-1-1 (Piece 8, 95–102)	61B1B			361	163	91	200	82	35	271	73	198	36	0	96	0	1606	99.90
SEG62A-1-1 (Piece 2, 13–20)	62A1A			379	200	88	207	87	37	292	83	231	45	26	101	0	1776	100.09
SEG63A-1-1 (Piece 3, 18–25)	63A1A			392	66	57	152	75	51	336	82	216	48	85	74	7	1641	100.04
SEG63A-1-1 (Piece 3, 18–25)	63A1B			396	71	57	178	77	48	331	78	212	47	18	123	0	1636	99.76
SEG64B-1-1 (Piece 1, 0–8)	64B1A			405	161	72	313	106	51	291	102	273	58	47	121	0	2000	100.12
SEG65B-1-1 (Piece 4, 23–29)	65B1A			373	92	77	248	65	36	321	64	163	35	0	72	0	1546	99.95
SEG70A-1-1 (Piece 6D, 59–66)	70A1A			355	141	62	219	70	27	203	63	143	31	0	72	0	1386	99.89
SEG71A-1-1 (Piece 2C, 28.5–32.5)	71A1A			371	142	40	224	75	28	182	67	148	27	0	83	0	1387	99.69
SEG76A-1-1 (Piece 2B, 6.5–11)	76A1A			402	88	52	228	85	29	172	70	182	33	0	94	12	1447	99.76
SEG77A-1-1 (Piece 3, 19–26)	77A1A			363	602	349	146	71	34	220	62	147	27	98	83	0	2202	99.63
SEG04A-1-1 (Piece 6A, 44–45)	04A1A	JOB892	25 Aug 2000	339	269	89	192	64	43	223	100	193	42	39	133	0	1726	99.72
SEG05D-1-1 (Piece 3, 53–57)	05D1A			329	43	46	163	80	55	368	103	228	54	106	84	0	1659	99.98

Table AT1 (continued).

Hole, core, section, interval (cm)	Lab ID	Job number	Date	Major element oxides (wt%)												Total
				SiO ₂	TiO ₂	Al ₂ O ₃	Fe ₂ O ₃	FeO	MnO	MgO	CaO	Na ₂ O	K ₂ O	P ₂ O ₅	LOI	
SEG06A-1-1 (Piece 3, 59–61)	06A1A			48.46	2.15	13.96	5.30	7.12	0.19	6.71	11.43	2.70	0.19	0.21	1.29	99.73
SEG06A-1-1 (Piece 3, 59–61)	06A1B			48.46	2.16	13.93	5.27	7.11	0.19	6.68	11.41	2.71	0.19	0.21	1.25	99.58
SEG07A-1-1 (Piece 2, 12.5–16)	07A1A			47.82	2.46	13.73	5.27	7.82	0.21	6.74	11.04	2.71	0.27	0.23	1.02	99.31
SEG08A-1-1 (Piece 1D, 11–15)	08A1A			46.22	4.39	11.92	3.63	12.67	0.24	5.41	10.06	2.09	0.19	0.43	2.01	99.27
SEG09A-1-1 (Piece 3, 5–11)	09A1A			48.99	1.94	14.36	3.57	6.86	0.16	6.46	11.59	2.69	0.25	0.20	2.36	99.45
SEG09B-1-1 (Piece 1, 0–2)	09B1A			47.09	2.37	15.10	3.52	7.64	0.20	5.31	11.49	2.78	0.30	0.26	3.30	99.35
SEG10A-1-1 (Piece 2, 8–13)	10A1A			48.35	2.23	13.85	4.49	8.15	0.20	6.00	10.89	2.90	0.34	0.24	2.02	99.64
SEG11C-1-1 (Piece 5, 20–28)	11C1A			47.67	2.40	14.19	7.65	6.15	0.21	4.37	10.14	2.93	0.58	0.25	2.90	99.45
SEG13C-1-1 (Piece 3, 8–13)	13C1A			48.11	2.77	13.89	3.96	8.24	0.25	4.64	10.49	2.97	0.67	0.32	3.15	99.44
SEG14A-1-1 (Piece 4A, 34–37)	14A1A			48.56	2.75	13.87	5.55	7.41	0.24	5.14	10.64	2.98	0.74	0.32	1.56	99.76
SEG16A-1-1 (Piece 2B, 61–64)	16A1A			47.29	2.69	13.51	5.36	8.00	0.20	5.29	10.35	2.91	0.67	0.31	2.71	99.29
SEG19A-1-1 (Piece 2, 8–11)	19A1A			46.31	2.83	13.75	4.20	8.87	0.24	4.11	10.37	2.90	0.52	0.36	4.88	99.33
SEG19B-1-1 (Piece 2B, 26–30)	19B1A			48.87	2.37	13.63	3.92	8.60	0.21	5.19	10.32	2.89	0.43	0.25	2.76	99.41
SEG21A-1-1 (Piece 4A, 8–10)	21A1A			46.51	3.10	13.58	5.53	8.94	0.22	6.51	10.43	2.71	0.29	0.32	1.44	99.57
SEG23A-1-1 (Piece 5, 13–19)	23A1A			47.69	3.28	13.38	3.87	9.83	0.21	6.01	10.69	2.67	0.37	0.33	0.89	99.24
SEG26A-1-1 (Piece 2A, 10–11)	26A1B			47.36	2.10	14.56	5.11	8.35	0.21	7.06	10.25	2.38	0.23	0.19	1.65	99.44
SEG27A-1-1 (Piece 1B, 24–28)	27A1B			48.63	2.14	14.82	4.25	8.27	0.18	6.57	10.92	2.50	0.24	0.18	0.94	99.64
SEG31A-1-1 (Piece 1B, 29–31.5)	31A1B			46.94	2.45	14.31	4.84	8.43	0.20	7.10	9.45	2.61	0.45	0.22	2.40	99.40
SEG31A-1-1 (Piece 1B, 29–31.5)	31A1C			47.05	2.62	14.95	5.25	7.56	0.19	6.34	7.24	3.26	1.09	0.20	4.04	99.79
SEG37A-1-1 (Piece 1, 0–6.5)	37A1A			45.86	2.75	14.67	6.83	6.04	0.30	7.52	9.21	3.11	0.35	0.29	2.28	99.20
SEG39A-1-1 (Piece 2, 10–11)	39A1A			45.70	0.88	15.02	4.49	6.26	0.25	11.04	10.51	1.84	0.10	0.07	3.38	99.53
SEG42A-1-1 (Piece 3, 4–9)	42A1A			45.78	0.71	15.49	5.15	4.46	0.16	11.10	11.29	1.47	0.13	0.06	3.94	99.74
SEG42B-1-1 (Piece 2, 2–6)	42B1A			45.56	0.70	16.14	5.38	3.62	0.14	11.12	12.38	1.38	0.11	0.06	2.86	99.45
SEG51A-1-1 (Piece 5, 36–47)	51A1A			45.56	2.90	13.76	11.28	2.20	0.17	4.67	7.23	5.23	1.50	0.40	5.00	99.87
SEG51B-1-1 (Piece 4B, 20–23)	51B1A			47.56	3.06	14.48	7.69	5.77	0.22	5.30	9.77	3.60	0.96	0.42	0.80	99.63
SEG53A-1-1 (Piece 4, 18.5–22)	53A1A			48.00	2.13	14.75	5.05	7.20	0.19	6.60	11.32	2.63	0.37	0.22	1.17	99.64
SEG55C-1-1 (Piece 2, 7–10)	55C1A			46.65	2.72	14.42	8.56	6.23	0.27	6.03	9.55	2.83	0.72	0.34	1.53	99.84
SEG56B-1-1 (Piece 2, 5–7)	56B1A			46.75	2.62	14.47	3.94	9.27	0.20	6.64	10.61	2.93	0.32	0.22	1.56	99.54
SEG61A-1-1 (Piece 4A, 33–37)	61A1A			47.03	2.64	14.51	5.59	6.79	0.18	6.93	10.82	2.78	0.38	0.25	1.35	99.25
SEG63B-1-1 (Piece 4, 14–17)	63B1A			45.55	2.62	14.13	8.08	5.84	0.25	6.74	10.70	2.74	0.66	0.29	1.81	99.41
SEG63B-1-1 (Piece 4, 14–17)	63B1B			46.64	2.57	14.60	5.82	6.54	0.24	6.78	11.11	2.76	0.56	0.26	1.65	99.51
SEG65A-1-1 (Piece 4A, 11–18)	65A1A			47.12	2.04	15.02	6.39	5.23	0.17	6.73	11.83	2.78	0.43	0.22	1.37	99.32
SEG74A-1-1 (Piece 3, 15–19)	74A1A			43.26	1.24	8.85	6.53	5.62	0.17	20.43	6.76	1.27	0.15	0.13	4.79	99.18
SEG74D-1-1 (Piece 1, 0–17)	74D1A			41.44	1.35	8.83	7.09	5.61	0.26	21.14	4.78	1.03	0.11	0.13	7.75	99.53
SEG74E-1-1 (Piece 1, 0–7)	74E1A			49.58	1.77	14.82	1.70	9.36	0.18	6.92	11.29	2.44	0.28	0.16	0.69	99.18
SEG75A-1-1 (Piece 3, 22–26)	75A1A			44.59	1.85	10.49	7.53	5.69	0.18	14.29	7.28	2.68	0.28	0.17	4.29	99.32
SEG75B-1-1 (Piece 2, 5–8)	75B1A			45.32	1.71	10.51	7.11	5.05	0.18	16.09	5.28	3.30	0.30	0.15	4.69	99.68
SEG75C-1-1 (Piece 5, 34–37)	75C1A			44.47	1.73	10.81	7.67	5.25	0.17	15.64	7.53	2.22	0.23	0.17	3.91	99.80
SEG76B-1-1 (Piece 2, 10–16)	76B1A			45.25	1.78	11.68	3.92	7.96	0.17	13.67	8.33	1.79	0.20	0.17	4.11	99.01
SEG77B-1-1 (Piece 4, 33–38)	77B1A			44.23	2.15	12.69	8.70	4.42	0.22	11.15	9.75	2.03	0.31	0.19	3.42	99.27
SEG77C-1-1 (Piece 2, 6–8)	77C1A			45.35	2.18	13.08	6.36	6.07	0.19	10.12	10.34	2.25	0.28	0.20	2.75	99.18
SEG77C-1-1 (Piece 5, 34–35)	77C1B			43.93	2.30	11.63	13.79	0.66	0.19	11.79	7.94	2.19	0.68	0.13	4.42	99.65
SEG79C-1-1 (Piece 3, 22–25)	79C1A			46.75	2.22	13.42	5.46	6.75	0.20	8.73	10.98	2.41	0.15	0.25	2.00	99.31

Note: LOI = loss on ignition.

Table AT1 (continued).

Hole, core, section, interval (cm)	Lab ID	Job number	Date	Trace elements (ppm)														
				V	Cr	Ni	Cu	Zn	Rb	Sr	Y	Zr	Nb	Ba	La	Ce	Total	Total (wt%)
SEG06A-1-1 (Piece 3, 59–61)	06A1A			364	148	81	167	77	48	247	113	220	49	105	118	4	1741	99.90
SEG06A-1-1 (Piece 3, 59–61)	06A1B			361	150	85	173	77	47	247	115	220	49	90	133	0	1747	99.75
SEG07A-1-1 (Piece 2, 12.5–16)	07A1A			388	122	107	239	89	42	249	106	218	43	47	84	0	1734	99.48
SEG08A-1-1 (Piece 1D, 11–15)	08A1A			504	38	74	279	119	70	266	168	382	86	40	122	8	2156	99.49
SEG09A-1-1 (Piece 3, 5–11)	09A1A			331	268	83	143	71	35	221	95	178	41	61	88	0	1615	99.61
SEG09B-1-1 (Piece 1, 0–2)	09B1A			333	37	45	91	78	42	369	99	212	47	109	135	18	1615	99.51
SEG10A-1-1 (Piece 2, 8–13)	10A1A			373	46	50	221	93	49	262	116	227	51	52	114	0	1654	99.81
SEG11C-1-1 (Piece 5, 20–28)	11C1A			348	5	36	164	85	55	360	116	245	57	217	94	0	1782	99.63
SEG13C-1-1 (Piece 3, 8–13)	13C1A			388	30	45	170	112	50	339	117	258	62	171	112	0	1854	99.62
SEG14A-1-1 (Piece 4A, 34–37)	14A1A			394	27	50	169	130	66	355	125	272	65	160	164	9	1986	99.96
SEG16A-1-1 (Piece 2B, 61–64)	16A1A			371	26	47	182	95	54	328	116	257	58	166	72	8	1780	99.47
SEG19A-1-1 (Piece 2, 8–11)	19A1A			380	9	42	114	101	61	374	125	284	68	204	121	0	1883	99.52
SEG19B-1-1 (Piece 2B, 26–30)	19B1A			398	56	55	215	101	46	230	119	240	52	150	94	0	1756	99.59
SEG21A-1-1 (Piece 4A, 8–10)	21A1A			396	136	93	161	101	58	313	135	303	65	120	109	22	2012	99.77
SEG23A-1-1 (Piece 5, 13–19)	23A1A			389	145	83	314	105	53	313	125	282	55	101	101	0	2066	99.45
SEG26A-1-1 (Piece 2A, 10–11)	26A1B			382	145	91	221	78	49	250	111	213	45	84	123	0	1792	99.62
SEG27A-1-1 (Piece 1B, 24–28)	27A1B			378	168	94	214	77	49	271	106	213	45	117	120	0	1852	99.82
SEG31A-1-1 (Piece 1B, 29–31.5)	31A1B			303	140	91	151	85	45	287	106	223	44	62	112	0	1649	99.56
SEG31A-1-1 (Piece 1B, 29–31.5)	31A1C			272	92	83	152	85	44	296	99	221	40	125	77	0	1586	99.95
SEG37A-1-1 (Piece 1, 0–6.5)	37A1A			449	371	186	159	100	41	304	99	229	38	86	126	0	2188	99.42
SEG39A-1-1 (Piece 2, 10–11)	39A1A			294	587	255	161	53	36	111	89	125	26	0	128	0	1865	99.72
SEG42A-1-1 (Piece 3, 4–9)	42A1A			233	569	327	96	36	36	126	74	113	25	22	125	0	1782	99.91
SEG42B-1-1 (Piece 2, 2–6)	42B1A			207	658	370	100	26	36	130	72	113	26	0	115	0	1853	99.63
SEG51A-1-1 (Piece 5, 36–47)	51A1A			277	19	61	165	106	57	388	99	297	54	299	114	14	1950	100.07
SEG51B-1-1 (Piece 4B, 20–23)	51B1A			384	19	67	146	99	70	609	122	327	73	351	116	44	2427	99.87
SEG53A-1-1 (Piece 4, 18.5–22)	53A1A			367	102	81	125	66	50	321	109	224	51	131	87	0	1714	99.81
SEG55C-1-1 (Piece 2, 7–10)	55C1A			410	33	66	195	86	68	332	133	299	63	221	142	41	2089	100.05
SEG56B-1-1 (Piece 2, 5–7)	56B1A			365	111	86	235	80	53	315	114	237	54	89	133	0	1872	99.73
SEG61A-1-1 (Piece 4A, 33–37)	61A1A			363	150	108	231	84	46	325	105	240	42	66	104	0	1864	99.44
SEG63B-1-1 (Piece 4, 14–17)	63B1A			382	49	74	160	72	70	370	121	260	64	149	107	0	1878	99.59
SEG63B-1-1 (Piece 4, 14–17)	63B1B			442	50	77	176	78	54	371	106	232	50	148	110	0	1894	99.70
SEG65A-1-1 (Piece 4A, 11–18)	65A1A			351	85	97	124	70	45	367	95	198	44	179	91	0	1746	99.50
SEG74A-1-1 (Piece 3, 15–19)	74A1A			258	1874	1214	76	64	35	194	76	146	19	0	48	0	4004	99.58
SEG74D-1-1 (Piece 1, 0–17)	74D1A			260	1962	1233	91	70	35	127	77	159	22	0	72	0	4108	99.94
SEG74E-1-1 (Piece 1, 0–7)	74E1A			325	231	87	194	72	40	236	92	180	31	72	75	0	1635	99.34
SEG75A-1-1 (Piece 3, 22–26)	75A1A			340	1128	779	172	81	44	183	93	189	28	11	86	0	3134	99.63
SEG75B-1-1 (Piece 2, 5–8)	75B1A			300	1120	727	144	94	30	133	71	163	17	3	50	0	2852	99.97
SEG75C-1-1 (Piece 5, 34–37)	75C1A			306	1142	783	130	79	42	203	89	183	28	1	72	0	3058	100.10
SEG76B-1-1 (Piece 2, 10–16)	76B1A			328	1413	614	132	68	37	206	83	169	28	46	50	0	3174	99.32
SEG77B-1-1 (Piece 4, 33–38)	77B1A			360	493	341	199	76	52	275	106	203	43	62	119	0	2329	99.50
SEG77C-1-1 (Piece 2, 6–8)	77C1A			384	531	334	110	71	45	264	100	195	39	78	106	0	2257	99.40
SEG77C-1-1 (Piece 5, 34–35)	77C1B			208	622	358	176	83	51	166	98	205	38	37	116	0	2158	99.86
SEG79C-1-1 (Piece 3, 22–25)	79C1A			390	689	432	184	84	43	297	102	196	39	27	86	2	2571	99.56

Table AT2. Microprobe analyses of plagioclase phenocrysts. (See table notes. Continued on next three pages.)

Hole, core, section, interval (cm)	Major element oxides (wt%)								Total	An
	SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MgO	CaO	Na ₂ O	K ₂ O		
163X-										
SEG01A-1-1, 57–61	52.54	0.09	29.11	1.09	0.09	12.52	4.58	0.17	100.19	0.60
	52.99	0.13	29.40	0.74	0.10	12.53	4.41	0.13	100.44	0.61
	52.32	0.04	29.38	0.84	0.11	13.03	4.34	0.16	100.21	0.62
	50.54	0.04	31.07	0.84	0.10	13.92	3.56	0.06	100.13	0.68
	50.43	0.04	30.53	0.83	0.14	14.09	3.53	0.10	99.71	0.69
	49.42	0.09	31.55	0.92	0.10	14.57	3.21	0.11	99.98	0.72
	49.01	0.05	31.95	0.81	0.12	15.32	2.94	0.07	100.26	0.74
Average	51.04	0.07	30.43	0.87	0.11	13.71	3.79	0.12	100.13	0.67
Standard	1.58	0.04	1.15	0.11	0.02	1.06	0.64	0.04		0.05
SEG01A-2-1, 60–65	48.40	0.08	32.26	0.83	0.12	15.78	2.64	0.03	100.14	0.77
	47.63	0.11	31.82	0.72	0.12	15.95	2.56	0.05	98.97	0.77
	47.56	0.11	32.37	0.57	0.13	16.21	2.17	0.04	99.16	0.81
	46.96	0.01	32.79	0.67	0.16	16.83	2.10	0.04	99.55	0.82
Average	47.64	0.08	32.31	0.70	0.14	16.19	2.37	0.04	99.45	0.79
Standard	0.59	0.05	0.40	0.11	0.02	0.46	0.28	0.01		0.02
SEG01A-2-1 (Piece 1B, 61–66)	55.47	0.10	27.28	0.80	0.08	10.13	5.75	0.24	99.85	0.49
	48.79	0.09	31.89	0.94	0.10	15.52	2.70	0.03	100.06	0.76
	47.84	0.06	31.86	0.54	0.15	16.09	2.38	0.04	98.96	0.79
Average	48.79	0.09	31.89	0.94	0.10	15.52	2.70	0.03	100.06	0.76
SEG02A-6-1, 29–34	56.14	0.16	26.83	0.84	0.06	9.42	6.04	0.40	99.89	0.46
	55.31	0.07	27.63	1.02	0.14	10.44	5.64	0.28	100.54	0.51
	54.46	0.14	29.06	0.93	0.10	11.36	5.34	0.33	101.73	0.54
	54.35	0.13	27.85	0.85	0.11	11.12	5.21	0.22	99.85	0.54
	54.10	0.15	28.31	0.94	0.10	11.46	5.22	0.24	100.52	0.55
	54.12	0.10	28.36	0.81	0.12	11.70	5.17	0.24	100.61	0.56
	53.94	0.13	28.31	0.95	0.12	11.75	5.02	0.24	100.46	0.56
	53.60	0.09	28.53	1.11	0.16	11.69	4.91	0.23	100.33	0.57
	53.71	0.05	28.52	0.82	0.14	11.68	4.89	0.23	100.04	0.57
	53.71	0.11	28.45	0.99	0.11	11.51	4.75	0.20	99.83	0.57
	53.74	0.04	29.18	0.96	0.13	12.02	4.94	0.23	101.25	0.57
	53.22	0.08	29.14	0.98	0.13	12.06	4.88	0.24	100.71	0.58
	53.55	0.04	28.49	0.84	0.14	11.82	4.73	0.23	99.84	0.58
Average	54.15	0.10	28.36	0.93	0.12	11.39	5.13	0.26	100.43	0.55
Standard	0.79	0.04	0.64	0.09	0.03	0.73	0.37	0.06		0.03
SEG02A-7-1, 46–50	54.81	0.15	27.84	0.86	0.09	11.03	5.41	0.28	100.45	0.53
	55.03	0.10	28.18	0.79	0.06	11.11	5.32	0.25	100.84	0.54
	53.80	0.07	28.02	0.90	0.10	11.38	5.07	0.25	99.61	0.55
	53.76	0.07	28.14	0.78	0.10	11.44	5.01	0.28	99.57	0.56
	54.09	0.13	28.14	0.77	0.13	11.52	4.93	0.25	99.96	0.56
Average	54.30	0.10	28.06	0.82	0.09	11.30	5.15	0.26	100.09	0.55
Standard	0.58	0.03	0.14	0.06	0.03	0.21	0.21	0.02		0.01
SEG05B-1-1 (Piece 3B, 41–45)	49.14	0.05	30.91	0.71	0.23	14.94	2.97	0.11	99.04	0.74
	46.52	0.11	32.53	0.55	0.21	15.98	2.11	0.08	98.09	0.81
	46.37	0.04	32.82	0.49	0.16	16.45	2.07	0.09	98.50	0.81
	46.37	0.00	31.85	0.61	0.15	17.09	2.03	0.05	98.15	0.82
Average	47.10	0.05	32.03	0.59	0.19	16.11	2.29	0.08	98.44	0.80
Standard	1.36	0.04	0.85	0.09	0.04	0.91	0.45	0.02		0.04
SEG05B-1-1 (Piece 6, 98–102)	48.66	0.08	32.51	0.45	0.20	16.07	2.50	0.03	100.50	0.78
	47.79	0.04	31.62	0.63	0.12	16.08	2.28	0.06	98.63	0.80
	47.90	0.07	32.28	0.53	0.12	16.10	2.11	0.04	99.16	0.81
	47.39	0.09	32.01	0.49	0.15	16.68	2.06	0.04	98.92	0.82
Average	47.94	0.07	32.11	0.53	0.15	16.23	2.24	0.04	99.30	0.80
Standard	0.53	0.02	0.38	0.08	0.04	0.30	0.20	0.01		0.02
SEG10B-1-1 (Piece 2G, 94–98)	51.47	0.05	30.01	0.70	0.13	13.92	3.77	0.13	100.19	0.67
	48.88	0.09	31.15	0.65	0.15	15.09	3.03	0.07	99.11	0.73
	48.94	0.01	31.25	0.85	0.13	15.11	2.97	0.05	99.30	0.74
Average	49.76	0.05	30.80	0.73	0.14	14.71	3.26	0.08	99.53	0.71
Standard	1.48	0.04	0.69	0.10	0.01	0.68	0.45	0.04		0.04
SEG11A-1-1 (Piece 2, 11–15)	47.93	0.05	32.36	0.59	0.11	16.15	2.13	0.06	99.39	0.81
	47.35	0.02	33.35	0.72	0.14	16.34	2.04	0.08	100.03	0.82
	47.40	0.03	32.97	0.77	0.11	16.44	1.90	0.04	99.66	0.83
Average	47.56	0.03	32.89	0.69	0.12	16.31	2.02	0.06	99.69	0.82
Standard	0.32	0.02	0.50	0.09	0.01	0.15	0.11	0.02		0.01

Table AT2 (continued).

Hole, core, section, interval (cm)	Major element oxides (wt%)										
	SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MgO	CaO	Na ₂ O	K ₂ O	Total	An	
SEG12A-1-1 (Piece 1A, 0–4)		47.63	0.03	33.11	0.55	0.16	15.95	2.19	0.06	99.68	0.80
		47.43	0.02	33.79	0.56	0.12	16.82	1.92	0.07	100.73	0.83
		47.38	0.09	33.87	0.46	0.12	16.65	1.88	0.05	100.49	0.83
		46.14	0.06	33.66	0.42	0.18	16.82	1.87	0.04	99.18	0.83
		47.15	0.08	33.65	0.55	0.16	17.17	1.87	0.03	100.65	0.84
		47.29	0.08	33.65	0.65	0.17	16.84	1.82	0.04	100.54	0.84
	Average	47.17	0.06	33.62	0.53	0.15	16.71	1.92	0.05	100.21	0.83
	Standard	0.53	0.03	0.27	0.08	0.02	0.41	0.13	0.02		0.01
SEG21D-1-1 (Piece 1A, 9–13)		56.32	0.08	26.95	0.83	0.07	9.54	6.05	0.34	100.18	0.47
		51.43	0.06	30.36	0.77	0.14	12.81	3.92	0.14	99.62	0.64
		52.17	0.08	30.55	0.68	0.19	13.43	3.78	0.14	101.03	0.66
	Average	51.80	0.07	30.45	0.72	0.17	13.12	3.85	0.14	100.32	0.65
SEG22A-1-1 (Piece 3A, 15–19)		51.67	0.09	30.72	0.75	0.16	13.02	3.98	0.14	100.53	0.64
		51.53	0.10	30.16	0.71	0.17	13.37	3.87	0.13	100.06	0.66
		52.09	0.10	30.30	0.68	0.16	13.21	3.82	0.13	100.47	0.66
		51.76	0.12	30.58	0.67	0.18	13.25	3.78	0.16	100.50	0.66
	Average	51.76	0.10	30.44	0.71	0.17	13.21	3.86	0.14	100.39	0.65
	Standard	0.24	0.01	0.25	0.04	0.01	0.14	0.09	0.01	0.79	0.01
SEG24A-1-1 (Piece 1, 0–4)		49.51	0.09	31.49	0.50	0.13	14.70	2.95	0.08	99.45	0.73
		48.90	0.11	32.15	0.62	0.11	15.32	2.64	0.05	99.90	0.76
		48.68	0.09	32.40	0.44	0.09	15.80	2.52	0.11	100.12	0.78
	Average	49.03	0.10	32.01	0.52	0.11	15.27	2.70	0.08	99.83	0.76
	Standard	0.43	0.01	0.47	0.09	0.02	0.55	0.22	0.03		0.02
SEG24A-1-1 (Piece 2, 4–8)		46.61	0.02	33.41	0.83	0.00	17.10	1.82	0.03	99.82	0.84
		46.01	0.04	33.86	1.00	0.10	17.46	1.71	0.01	100.18	0.85
		45.31	0.04	33.20	0.59	0.16	17.58	1.46	0.03	98.37	0.87
		46.42	0.03	33.71	0.81	0.13	17.64	1.44	0.04	100.23	0.87
	Average	46.09	0.03	33.54	0.81	0.10	17.44	1.61	0.03	99.65	0.86
	Standard	0.57	0.01	0.30	0.17	0.07	0.24	0.19	0.01		0.02
SEG26A-1-1 (Piece 6G, 85–89)		49.12	0.06	32.27	0.75	0.20	15.43	2.79	0.07	100.69	0.75
		48.95	0.04	31.81	0.65	0.14	15.50	2.62	0.06	99.77	0.77
		48.48	0.05	32.58	0.67	0.17	15.93	2.45	0.03	100.37	0.78
		48.28	0.03	32.67	0.79	0.20	15.87	2.38	0.03	100.25	0.79
	Average	48.71	0.05	32.33	0.72	0.18	15.68	2.56	0.05	100.27	0.77
	Standard	0.39	0.01	0.39	0.06	0.03	0.26	0.18	0.02		0.02
SEG27A-1-1 (Piece 5A, 47–51)		50.85	0.02	30.91	0.61	0.21	14.51	3.44	0.09	100.63	0.70
		50.63	0.07	31.11	0.71	0.20	14.46	3.21	0.05	100.44	0.71
		49.99	0.03	31.64	0.70	0.18	15.13	2.97	0.09	100.72	0.74
	Average	50.49	0.04	31.22	0.68	0.19	14.70	3.20	0.08	100.60	0.72
	Standard	0.45	0.03	0.38	0.06	0.02	0.37	0.23	0.02		0.02
SEG28A-1-1 (Piece 5, 28–32)		50.98	0.11	30.37	0.80	0.10	13.82	3.83	0.11	100.11	0.67
		50.54	0.04	30.79	0.81	0.10	13.92	3.31	0.09	99.61	0.70
		50.03	0.09	31.35	0.72	0.14	14.73	3.15	0.11	100.32	0.72
	Average	50.51	0.08	30.83	0.78	0.11	14.16	3.43	0.10	100.01	0.70
	Standard	0.48	0.03	0.49	0.05	0.02	0.50	0.36	0.01		0.03
SEG31A-1-1 (Piece 1E, 61–65)		50.91	0.06	29.46	0.53	0.20	13.55	3.44	0.06	98.20	0.69
		48.92	0.06	29.85	0.68	0.15	14.51	2.84	0.03	97.04	0.74
	Average	49.91	0.06	29.66	0.61	0.17	14.03	3.14	0.04	97.62	0.71
SEG40A-1-2 (Piece 1, 10–14)		45.29	0.05	32.80	0.74	0.08	17.51	1.56	0.03	98.05	0.86
		46.28	0.04	32.58	0.74	0.14	17.40	1.51	0.00	98.68	0.86
		45.95	0.03	32.46	0.60	0.17	17.38	1.47	0.02	98.08	0.87
		45.77	0.02	32.41	0.75	0.10	17.63	1.32	0.04	98.04	0.88
	Average	45.82	0.03	32.56	0.71	0.12	17.48	1.46	0.02	98.21	0.87
	Standard	0.41	0.01	0.17	0.07	0.04	0.11	0.11	0.02		0.01
SEG41A-1-1 (Piece 1C, 16–20) 41A-1-1, 16-20 cm, Piece 1C 41A-1-1, 16-20 cm, Piece 1C 41A-1-1, 16-20 cm, Piece 1C 41A-1-1, 16-20 cm, Piece 1C		47.38	0.07	30.71	0.71	0.14	15.58	2.39	0.04	97.02	0.78
		47.41	0.02	31.13	0.67	0.19	16.00	2.42	0.03	97.87	0.79
		47.68	0.00	31.45	0.63	0.18	15.76	2.30	0.04	98.03	0.79
		47.66	0.03	31.27	0.78	0.16	16.26	2.27	0.01	98.42	0.80
		46.94	0.07	30.54	0.73	0.23	16.24	2.20	0.09	97.05	0.80
	Average	47.41	0.04	31.02	0.71	0.18	15.97	2.32	0.04	97.68	0.79
	Standard	0.30	0.03	0.38	0.06	0.04	0.30	0.09	0.03		0.01
SEG42B-1-1 (Piece 2, 7–8)		46.48	0.02	33.63	0.37	0.19	16.95	1.15	0.02	98.82	0.89
		46.17	0.04	33.48	0.49	0.23	16.79	1.13	0.00	98.33	0.89
		46.15	0.04	33.31	0.44	0.20	17.52	1.09	0.00	98.76	0.90
	Average	46.27	0.04	33.47	0.43	0.21	17.09	1.12	0.01	98.64	0.89
	Standard	0.19	0.01	0.16	0.06	0.02	0.39	0.03	0.01		0.00

Table AT2 (continued).

Hole, core, section, interval (cm)		Major element oxides (wt%)								Total	An
		SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MgO	CaO	Na ₂ O	K ₂ O		
SEG42C-1-1 (Piece 5, 41–45)		49.47	0.02	32.04	0.93	0.17	15.79	2.26	0.03	100.70	0.79
		46.87	0.02	33.35	0.58	0.17	17.26	1.44	0.04	99.73	0.87
	Average	48.17	0.02	32.69	0.75	0.17	16.52	1.85	0.03	100.21	0.83
SEG43A-1-1 (Piece 4, 11–15)		47.68	0.06	32.33	0.58	0.27	17.25	1.62	0.01	99.81	0.85
		46.50	0.01	32.64	0.78	0.18	17.56	1.54	0.01	99.21	0.86
		46.48	0.00	32.45	0.58	0.13	17.49	1.50	0.03	98.65	0.87
		47.06	0.02	32.45	0.60	0.24	17.42	1.44	0.05	99.27	0.87
		47.31	0.01	32.76	0.44	0.19	17.73	1.42	0.02	99.87	0.87
		46.37	0.03	33.03	0.44	0.14	17.60	1.20	0.04	98.84	0.89
	Average	46.90	0.02	32.61	0.57	0.19	17.51	1.45	0.02	99.28	0.87
	Standard	0.53	0.02	0.26	0.13	0.06	0.16	0.14	0.02		0.01
SEG45A-1-1 (Piece 6, 45–49)		50.78	0.04	31.02	0.92	0.26	14.68	2.73	0.08	100.51	0.75
		50.07	0.08	31.14	0.75	0.24	15.40	2.55	0.02	100.25	0.77
	Average	50.43	0.06	31.08	0.84	0.25	15.04	2.64	0.05	100.38	0.76
SEG51C-1-1 (Piece 6, 25–29)		54.50	0.15	28.40	0.59	0.13	11.18	4.70	0.19	99.84	0.57
		53.92	0.14	28.18	0.75	0.13	11.59	4.59	0.27	99.57	0.58
		53.68	0.14	28.55	0.83	0.11	12.06	4.47	0.27	100.10	0.60
	Average	54.03	0.14	28.38	0.72	0.12	11.61	4.58	0.24	99.84	0.58
	Standard	0.43	0.01	0.18	0.12	0.01	0.44	0.12	0.05		0.02
SEG53B-1-1 (Piece 2, 85–115)		46.85	0.05	32.71	0.65	0.20	15.53	2.74	0.11	98.84	0.76
		48.58	0.04	32.48	0.85	0.18	15.18	2.54	0.07	99.93	0.77
		47.46	0.06	32.02	0.59	0.19	15.86	2.50	0.07	98.76	0.78
		47.51	0.05	32.71	0.55	0.14	14.71	2.31	0.06	98.05	0.78
	Average	47.60	0.05	32.48	0.66	0.18	15.32	2.53	0.08	98.89	0.77
	Standard	0.72	0.01	0.33	0.13	0.03	0.49	0.18	0.02		0.01
SEG54A-1-1 (Piece 2, 14–18)		50.93	0.13	29.29	1.08	0.10	13.57	3.96	0.15	99.21	0.65
		46.88	0.07	31.14	0.91	0.07	16.50	2.27	0.09	97.93	0.80
		46.38	0.06	31.72	0.76	0.05	16.21	1.99	0.02	97.20	0.82
		46.39	0.09	32.00	0.70	0.07	16.52	1.89	0.08	97.74	0.83
	Average	46.55	0.08	31.62	0.79	0.06	16.41	2.05	0.06	97.62	0.82
	Standard	0.29	0.01	0.44	0.11	0.01	0.17	0.20	0.03		0.01
SEG55B-1-1 (Piece 4, 27–31)		50.57	0.08	30.63	0.69	0.20	13.86	3.29	0.08	99.39	0.70
		48.05	0.07	29.76	0.58	0.22	14.22	3.33	0.10	96.32	0.70
		46.34	0.07	30.78	0.55	0.17	15.86	2.66	0.05	96.49	0.77
		46.25	0.12	31.16	0.58	0.14	15.52	2.58	0.04	96.39	0.77
		46.53	0.03	31.23	0.72	0.22	15.78	2.61	0.04	97.18	0.77
		47.42	0.11	31.92	0.62	0.22	15.95	2.46	0.04	98.74	0.78
		48.48	0.05	31.69	0.44	0.22	15.48	2.35	0.10	98.80	0.78
	Average	47.66	0.08	31.02	0.60	0.20	15.24	2.75	0.06	97.62	0.75
	Standard	1.55	0.03	0.72	0.09	0.03	0.84	0.39	0.03		0.04
		50.55	0.05	30.21	0.85	0.31	14.01	3.42	0.08	99.49	0.69
SEG56A-1-1 (Piece 4, 14–18)		48.26	0.02	29.96	0.52	0.22	14.13	3.38	0.09	96.58	0.70
		48.15	0.08	30.34	0.62	0.21	14.19	3.19	0.05	96.84	0.71
		48.08	0.03	30.36	0.57	0.15	13.92	3.09	0.08	96.27	0.71
		50.69	0.08	30.42	0.52	0.18	14.45	3.19	0.08	99.60	0.71
		47.62	0.08	30.54	0.62	0.19	14.63	3.08	0.03	96.79	0.72
		47.80	0.07	30.43	0.51	0.17	14.44	3.00	0.07	96.49	0.73
		47.30	0.06	32.48	0.50	0.17	16.31	2.16	0.00	98.97	0.81
	Average	48.74	0.06	30.32	0.60	0.20	14.25	3.19	0.07	97.44	0.71
	Standard	1.31	0.02	0.78	0.12	0.05	0.77	0.39	0.03	1.45	0.04
		51.19	0.15	29.11	0.75	0.14	12.81	3.95	0.24	98.34	0.64
57A-1-1 (Piece 5, 18–22)		51.24	0.12	29.52	1.01	0.13	12.84	3.84	0.17	98.87	0.65
		49.87	0.09	30.65	0.67	0.08	13.90	3.20	0.16	98.61	0.71
	Average	50.76	0.12	29.76	0.81	0.12	13.19	3.66	0.19	98.61	0.67
	Standard	0.78	0.03	0.80	0.17	0.03	0.62	0.40	0.04		0.03
SEG58A-1-1 (Piece 1C, 9–13)		51.74	0.12	29.77	0.55	0.14	13.14	3.85	0.15	99.46	0.65
		50.83	0.08	30.06	0.59	0.20	12.88	3.70	0.12	98.45	0.66
		51.12	0.10	30.11	0.58	0.14	13.34	3.77	0.13	99.30	0.66
		50.65	0.06	30.14	0.70	0.18	13.60	3.68	0.11	99.11	0.67
	Average	51.08	0.09	30.02	0.61	0.16	13.24	3.75	0.13	99.08	0.66
	Standard	0.48	0.03	0.17	0.07	0.03	0.30	0.08	0.02		0.01
SEG60B-1-1 (Piece 6A, 93–97)		53.09	0.18	28.64	0.79	0.16	12.19	4.57	0.24	99.86	0.60
		51.80	0.15	29.41	0.71	0.17	12.97	4.08	0.18	99.47	0.64
		50.55	0.12	29.88	0.61	0.17	13.64	3.67	0.17	98.82	0.67

Table AT2 (continued).

Hole, core, section, interval (cm)		Major element oxides (wt%)									
		SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MgO	CaO	Na ₂ O	K ₂ O	Total	An
SEG61B-1-1 (Piece 1B, 19–23)	Average	47.78	0.04	32.28	0.47	0.18	16.67	2.22	0.08	99.70	0.81
		51.81	0.15	29.31	0.71	0.16	12.94	4.10	0.20	99.38	0.64
		1.27	0.03	0.63	0.09	0.00	0.73	0.45	0.04		0.04
	Standard	53.41	0.15	28.61	0.88	0.11	11.61	4.99	0.21	99.97	0.56
		50.67	0.11	30.67	0.87	0.16	14.29	3.39	0.08	100.24	0.70
		47.87	0.07	32.55	0.67	0.13	16.36	2.42	0.04	100.11	0.79
SEG61B-1-1 (Piece 8, 95–99)	Average	52.04	0.13	29.64	0.88	0.14	12.95	4.19	0.15	100.10	0.63
		51.54	0.06	29.55	0.50	0.18	12.21	3.97	0.12	98.14	0.63
		51.38	0.10	29.66	0.57	0.21	12.74	3.65	0.09	98.38	0.66
	Standard	51.10	0.08	29.74	0.55	0.23	13.03	3.71	0.09	98.53	0.66
		50.99	0.14	29.84	0.46	0.25	13.39	3.76	0.10	98.92	0.66
		51.25	0.09	29.70	0.52	0.22	12.84	3.77	0.10	98.49	0.65
SEG62A-1-1 (Piece 2, 13–17)	Average	0.25	0.03	0.12	0.05	0.03	0.50	0.14	0.02		0.02
		50.78	0.07	29.82	0.48	0.15	13.31	3.58	0.10	98.29	0.67
		50.07	0.10	30.24	0.51	0.16	13.51	3.46	0.10	98.15	0.68
	Standard	49.60	0.08	30.44	0.58	0.12	13.91	3.18	0.08	97.99	0.71
		49.84	0.09	30.41	0.44	0.15	13.96	3.10	0.08	98.07	0.71
		50.07	0.08	30.23	0.50	0.14	13.67	3.33	0.09	98.12	0.69
SEG63A-1-1 (Piece 3, 18–20)	Average	0.51	0.01	0.29	0.06	0.02	0.31	0.23	0.01		0.02
		47.22	0.09	31.41	0.69	0.15	15.54	2.50	0.09	97.68	0.77
		47.82	0.07	31.14	0.54	0.11	15.37	2.44	0.04	97.54	0.78
	Standard	46.91	0.08	31.81	0.59	0.09	15.73	2.26	0.08	97.55	0.79
		47.32	0.08	31.45	0.61	0.12	15.55	2.40	0.07	97.59	0.78
		0.46	0.01	0.34	0.08	0.03	0.18	0.12	0.02		0.01
SEG64B-1-1 (Piece 1, 0–4)	Average	52.37	0.11	30.21	0.63	0.19	13.16	3.96	0.12	100.74	0.65
		51.81	0.16	30.61	0.63	0.16	13.88	3.90	0.16	101.31	0.66
		50.81	0.10	31.27	0.67	0.15	14.07	3.64	0.12	100.83	0.68
	Standard	51.13	0.12	30.42	0.76	0.18	14.12	3.52	0.09	100.34	0.69
		51.53	0.12	30.63	0.67	0.17	13.81	3.75	0.12	100.80	0.67
		0.70	0.03	0.46	0.06	0.02	0.44	0.21	0.03		0.02
SEG70A-1-1 (Piece 6D, 62–68)	Average	49.38	0.04	31.76	0.60	0.20	14.82	3.17	0.09	100.05	0.72
		49.05	0.09	32.34	0.73	0.20	15.07	2.69	0.05	100.23	0.76
		48.01	0.12	32.73	0.64	0.16	15.59	2.52	0.03	99.79	0.77
	Standard	47.83	0.05	33.04	0.78	0.18	15.68	2.45	0.06	100.07	0.78
		48.56	0.07	32.47	0.69	0.19	15.29	2.71	0.06	100.04	0.76
		0.76	0.04	0.55	0.08	0.02	0.41	0.32	0.02		0.03
SEG71A-1-1 (Piece 2C, 285–325)	Average	50.58	0.07	31.36	0.69	0.24	14.41	3.27	0.05	100.67	0.71
		49.83	0.02	31.08	0.82	0.14	14.85	3.02	0.06	99.83	0.73
		49.07	0.07	32.15	0.55	0.27	16.27	2.39	0.03	100.79	0.79
	Standard	49.38	0.03	33.41	0.57	0.18	16.44	2.34	0.04	102.38	0.80
		48.12	0.04	32.24	0.83	0.17	16.31	2.29	0.04	100.05	0.80
		47.28	0.03	33.65	0.71	0.18	16.86	2.01	0.01	100.74	0.82
SEG76A-1-1 (Piece 2B, 8–10)	Average	49.04	0.05	32.31	0.69	0.20	15.86	2.55	0.04	100.74	0.77
		1.19	0.02	1.05	0.12	0.05	0.98	0.48	0.02		0.04
		68.17	0.01	19.63	0.76	0.36	0.82	11.00	0.04	100.79	0.04
	Standard	65.26	0.02	22.39	0.34	0.11	3.74	9.51	0.07	101.43	0.18
		58.54	0.06	26.22	0.66	0.17	9.11	6.25	0.06	101.07	0.45
		51.85	0.07	29.96	0.69	0.23	13.53	3.55	0.09	99.97	0.68
Average	51.85	0.07	29.96	0.69	0.23	13.53	3.55	0.09	99.97	0.68	

Notes: An = anorthite. * = analysis excluded from calculation of average.

Table AT3. Microprobe analyses of augite phenocrysts. (See table notes. Continued on next four pages.)

Hole, core, section, interval (cm)	Texture	Major element oxides (wt%)											Total	Mg#
		SiO ₂	TiO ₂	Al ₂ O ₃	MnO	FeO	MgO	CaO	Na ₂ O	K ₂ O	Cr ₂ O ₃	NiO		
163X-														
SEG01A-1-1, 57–61		49.95	1.22	2.72	0.26	11.04	14.43	20.00	0.52	0.04	0.10	0.00	100.27	0.70
		52.05	0.56	1.82	0.14	8.55	16.44	19.78	0.29	0.01	0.15	0.01	99.79	0.77
		51.65	0.61	2.26	0.10	8.14	16.09	20.91	0.61	0.04	0.26	0.00	100.66	0.78
		51.80	0.75	2.58	0.11	7.78	15.49	20.73	0.50	0.04	0.21	0.03	100.01	0.78
		52.39	0.70	2.14	0.13	7.81	16.01	21.10	0.33	0.04	0.28	0.07	101.02	0.79
		52.16	0.55	2.02	0.10	7.38	16.40	20.73	0.21	0.01	0.24	0.00	99.82	0.80
	Average	51.67	0.73	2.25	0.14	8.45	15.81	20.54	0.41	0.03	0.21	0.02	100.26	0.77
	Standard	0.88	0.25	0.34	0.06	1.33	0.76	0.53	0.15	0.02	0.07	0.03		0.04
SEG01A-2-1, 60–65		50.97	0.83	2.81	0.26	8.00	15.89	20.52	0.30	0.00	0.36	0.03	99.98	0.78
		50.93	0.78	2.76	0.16	7.71	15.86	20.16	0.27	0.00	0.27	0.34	99.25	0.79
		51.24	0.65	2.42	0.08	7.46	15.90	20.30	0.25	0.03	0.27	0.00	98.60	0.79
		51.34	0.63	2.69	0.22	7.52	16.43	20.68	0.31	0.00	0.45	0.09	100.35	0.80
	Average	51.12	0.72	2.67	0.18	7.67	16.02	20.41	0.28	0.01	0.34	0.12	99.54	0.79
	Standard	0.20	0.10	0.17	0.08	0.24	0.27	0.23	0.03	0.01	0.08	0.16		0.01
SEG01A-2-1 (Piece 1B, 61–66)		51.54	0.88	2.80	0.24	8.26	15.53	20.60	0.22	0.00	0.33	0.09	100.50	0.77
		50.99	0.72	2.51	0.20	8.30	15.67	20.82	0.25	0.01	0.22	0.09	99.78	0.77
		50.89	0.76	2.67	0.12	8.09	15.60	20.59	0.29	0.03	0.30	0.13	99.46	0.77
		51.28	0.66	2.30	0.11	8.19	15.82	20.90	0.26	0.00	0.23	0.00	99.74	0.77
	Average	51.18	0.75	2.57	0.17	8.21	15.65	20.73	0.26	0.01	0.27	0.08	99.87	0.77
	Standard	0.29	0.09	0.22	0.06	0.09	0.12	0.16	0.03	0.01	0.05	0.05		0.00
SEG02A-6-1, 29–34		48.69	1.64	3.56	0.29	16.50	15.31	15.56	0.34	0.04	0.06	0.00	101.99	0.62
		50.75	1.01	2.58	0.36	15.64	14.62	17.49	0.23	0.00	0.05	0.07	102.81	0.62
		48.74	1.59	3.61	0.19	14.17	13.86	17.88	0.40	0.01	0.06	0.05	100.57	0.64
		49.40	1.37	2.75	0.38	14.94	14.78	17.35	0.32	0.00	0.04	0.03	101.36	0.64
		50.73	1.11	2.88	0.31	15.67	15.84	14.85	0.29	0.02	0.15	0.03	101.88	0.64
		50.49	0.99	2.52	0.48	15.65	16.43	14.81	0.33	0.01	0.00	0.00	101.70	0.65
		51.06	0.84	1.55	0.42	15.44	16.21	15.42	0.17	0.02	0.03	0.10	101.25	0.65
		49.96	1.14	2.96	0.34	13.70	14.91	16.63	0.34	0.00	0.17	0.00	100.14	0.66
		50.73	0.98	2.56	0.31	13.79	15.40	17.82	0.32	0.02	0.17	0.00	102.10	0.67
		49.26	1.14	3.18	0.34	12.73	14.34	17.97	0.33	0.02	0.09	0.03	99.43	0.67
		49.49	1.23	2.82	0.30	12.35	14.19	18.65	0.34	0.00	0.24	0.00	99.62	0.67
		50.20	1.05	2.76	0.19	12.71	14.81	17.68	0.32	0.01	0.12	0.00	99.85	0.67
	Average	49.96	1.17	2.81	0.33	14.44	15.06	16.84	0.31	0.01	0.10	0.03	101.06	0.65
	Standard	0.82	0.25	0.54	0.08	1.39	0.80	1.34	0.06	0.01	0.07	0.03		0.02
SEG04B-1-1 (Piece 6, 60–61)	mi	49.10	1.07	5.35	0.14	7.43	15.48	18.87	0.26	0.00	0.54	0.00	98.24	0.79
		50.77	0.57	3.29	0.05	5.83	15.64	20.61	0.26	0.00	0.59	0.06	97.65	0.83
		51.31	0.60	3.20	0.00	6.16	15.87	20.90	0.28	0.00	0.65	0.00	98.98	0.82
	Average	50.39	0.75	3.95	0.06	6.47	15.66	20.13	0.27	0.00	0.59	0.02	98.29	0.81
	Standard	1.15	0.28	1.22	0.07	0.85	0.20	1.10	0.01	0.00	0.05	0.04		0.02
SEG05B-1-1 (Piece 3B, 41–45)	mi	50.85	0.77	2.81	0.20	7.08	15.69	21.48	0.23	0.00	0.31	0.05	99.47	0.80
		50.28	0.82	2.99	0.09	6.85	15.45	20.87	0.28	0.00	0.17	0.00	97.80	0.80
		51.29	0.79	2.96	0.05	6.75	15.47	21.01	0.33	0.00	0.12	0.02	98.80	0.80

Table AT3 (continued).

Hole, core, section, interval (cm)	Texture	Major element oxides (wt%)														
		SiO ₂	TiO ₂	Al ₂ O ₃	MnO	FeO	MgO	CaO	Na ₂ O	K ₂ O	Cr ₂ O ₃	NiO	Total	Mg#		
SEG10B-1-1 (Piece 2G, 94–98)	Average Standard	52.05	0.69	2.32	0.17	6.86	15.91	20.91	0.24	0.00	0.28	0.11	99.55	0.81		
		51.32	0.76	2.49	0.07	6.72	15.87	21.26	0.28	0.00	0.38	0.00	99.16	0.81		
		51.79	0.71	2.48	0.20	6.61	15.90	20.90	0.28	0.01	0.25	0.03	99.14	0.81		
		51.26	0.76	2.67	0.13	6.81	15.72	21.07	0.27	0.00	0.25	0.04	98.99	0.80		
		0.64	0.05	0.28	0.07	0.16	0.21	0.24	0.04	0.00	0.09	0.04		0.00		
	Average Standard	51.11	0.77	3.01	0.26	7.62	15.40	20.47	0.27	0.00	0.13	0.00	99.05	0.78		
		50.97	0.75	3.07	0.14	7.33	15.53	20.73	0.21	0.01	0.22	0.00	98.96	0.79		
		50.83	0.63	2.51	0.31	7.01	16.24	20.79	0.27	0.02	0.11	0.01	98.73	0.80		
		50.97	0.72	2.86	0.24	7.32	15.72	20.66	0.25	0.01	0.15	0.00	98.91	0.79		
		0.14	0.07	0.30	0.08	0.30	0.45	0.17	0.03	0.01	0.06	0.01		0.01		
SEG11A-1-1 (Piece 2, 11–15)	Average Standard	50.36	0.68	2.09	0.29	9.60	16.24	18.25	0.18	0.00	0.07	0.00	97.76	0.75		
		52.43	0.61	2.02	0.24	8.94	16.73	19.02	0.21	0.00	0.19	0.00	100.38	0.77		
		50.01	0.93	4.13	0.20	8.21	15.94	19.06	0.31	0.00	0.26	0.06	99.10	0.78		
		52.31	0.55	1.91	0.14	8.23	16.96	19.03	0.29	0.01	0.17	0.01	99.62	0.79		
		51.40	0.61	2.69	0.13	7.39	15.73	20.45	0.28	0.00	0.13	0.06	98.89	0.79		
	Average Standard	51.63	0.59	2.61	0.21	6.66	15.92	20.45	0.31	0.00	0.24	0.04	98.66	0.81		
		51.36	0.66	2.57	0.20	8.17	16.25	19.38	0.26	0.00	0.18	0.03	99.07	0.78		
		0.99	0.14	0.83	0.06	1.05	0.49	0.88	0.06	0.00	0.07	0.03		0.02		
		SEG21D-1-1 (Piece 1A, 9–13)	Average Standard	50.03	1.42	4.12	0.21	10.17	15.47	17.88	0.34	0.00	0.23	0.11	99.98	0.73
				52.71	0.60	1.56	0.38	12.54	20.74	10.88	0.13	0.00	0.18	0.05	99.78	0.75
48.74	1.31			4.09	0.17	9.26	15.54	19.17	0.30	0.02	0.35	0.00	98.96	0.75		
51.88	0.88			2.34	0.14	9.49	15.94	19.42	0.24	0.02	0.24	0.00	100.58	0.75		
50.48	1.10			3.49	0.26	8.50	15.55	20.07	0.34	0.00	0.47	0.06	100.31	0.77		
Average Standard	50.77		1.06	3.12	0.23	9.99	16.65	17.49	0.27	0.01	0.29	0.04	99.92	0.75		
	1.56		0.33	1.13	0.09	1.54	2.30	3.78	0.09	0.01	0.12	0.05		0.01		
	SEG22A-1-1 (Piece 3A, 15–19)		Average Standard	51.36	0.81	1.91	0.34	10.95	17.22	16.46	0.20	0.01	0.18	0.07	99.52	0.74
				49.66	1.32	4.04	0.10	9.21	15.81	18.76	0.35	0.00	0.48	0.06	99.78	0.75
				50.32	1.08	2.95	0.12	8.87	16.05	20.13	0.26	0.02	0.33	0.04	100.15	0.76
51.26		0.87		2.41	0.20	8.74	16.61	18.84	0.27	0.00	0.39	0.02	99.61	0.77		
50.65		1.02		2.83	0.19	9.44	16.42	18.55	0.27	0.01	0.35	0.05	99.77	0.76		
Average Standard		0.81	0.23	0.91	0.11	1.03	0.63	1.53	0.06	0.01	0.12	0.02		0.02		
		SEG24A-1-1 (Piece 1, 0–4)	Average Standard	48.77	1.41	4.47	0.13	9.67	15.97	17.65	0.28	0.00	0.53	0.05	98.93	0.75
				51.56	0.71	1.97	0.28	10.27	17.78	16.80	0.21	0.00	0.33	0.05	99.95	0.76
				51.91	0.76	1.93	0.21	9.89	17.89	16.10	0.16	0.02	0.32	0.00	99.19	0.76
				50.75	0.96	2.79	0.21	9.94	17.21	16.85	0.22	0.01	0.39	0.03	99.36	0.75
1.72	0.39			1.45	0.07	0.30	1.08	0.77	0.06	0.01	0.12	0.03		0.01		
SEG24A-1-1 (Piece 2, 4–8)	Average Standard		50.01	0.59	4.64	0.06	8.18	15.90	19.35	0.22	0.01	0.88	0.00	99.83	0.78	
			49.32	0.77	4.71	0.19	7.10	15.85	20.32	0.27	0.01	1.01	0.03	99.58	0.80	
			52.10	0.45	2.29	0.00	7.62	17.33	19.66	0.29	0.00	0.43	0.00	100.17	0.80	
			50.08	0.68	3.97	0.25	6.42	16.07	20.66	0.23	0.00	0.93	0.05	99.35	0.82	
			51.71	0.42	2.25	0.19	6.85	18.00	19.58	0.25	0.00	0.59	0.14	99.98	0.82	
	Average Standard	51.09	0.52	2.92	0.16	6.50	17.30	19.85	0.18	0.00	0.63	0.00	99.16	0.83		
		50.72	0.57	3.46	0.14	7.11	16.74	19.90	0.24	0.00	0.75	0.04	99.68	0.81		
		1.08	0.14	1.13	0.10	0.68	0.92	0.49	0.04	0.00	0.23	0.06		0.02		

Table AT3 (continued).

Hole, core, section, interval (cm)	Texture	Major element oxides (wt%)											Total	Mg#
		SiO ₂	TiO ₂	Al ₂ O ₃	MnO	FeO	MgO	CaO	Na ₂ O	K ₂ O	Cr ₂ O ₃	NiO		
SEG26A-1-1 (Piece 6G, 85–89)	Average Standard	50.21	0.88	3.92	0.27	9.21	15.65	19.00	0.28	0.00	0.68	0.02	100.13	0.75
		50.62	0.80	3.67	0.31	9.02	16.18	18.90	0.25	0.00	0.57	0.12	100.43	0.76
		52.33	0.50	1.77	0.30	9.59	18.35	16.05	0.19	0.00	0.31	0.02	99.40	0.77
		51.05	0.73	3.12	0.29	9.27	16.73	17.98	0.24	0.00	0.52	0.05	99.99	0.76
		1.12	0.20	1.17	0.02	0.29	1.43	1.68	0.05	0.00	0.19	0.06		0.01
SEG27A-1-1 (Piece 5A, 47–51)	Average Standard	50.92	0.64	3.00	0.13	8.65	16.27	19.74	0.30	0.00	0.43	0.00	100.10	0.77
		50.96	0.71	2.98	0.20	8.32	16.38	19.65	0.28	0.01	0.59	0.09	100.17	0.78
		51.54	0.64	2.87	0.18	8.11	16.86	19.62	0.25	0.00	0.51	0.00	100.58	0.79
		51.54	0.59	2.59	0.13	8.08	17.00	19.29	0.38	0.00	0.63	0.04	100.25	0.79
		51.24	0.65	2.86	0.16	8.29	16.63	19.58	0.30	0.00	0.54	0.03	100.28	0.78
SEG28A-1-1 (Piece 5, 28–32)	Average Standard	0.34	0.05	0.19	0.04	0.26	0.36	0.20	0.06	0.01	0.09	0.04		0.01
		50.00	0.71	3.20	0.16	8.21	15.80	20.29	0.36	0.00	0.70	0.00	99.45	0.77
		51.29	0.57	2.37	0.09	8.17	16.80	20.23	0.26	0.03	0.45	0.00	100.27	0.79
		51.16	0.66	2.85	0.23	7.95	16.44	19.47	0.27	0.00	0.43	0.02	99.48	0.79
		50.82	0.65	2.80	0.16	8.11	16.35	20.00	0.30	0.01	0.53	0.01	99.73	0.78
SEG29A-1-1 (Piece 4B, 26–30)	Average Standard	0.71	0.07	0.42	0.07	0.14	0.50	0.46	0.06	0.02	0.15	0.01		0.01
		49.32	1.16	4.37	0.20	9.94	15.90	17.24	0.26	0.00	0.71	0.02	99.12	0.74
		49.48	1.24	4.15	0.23	9.41	15.20	19.29	0.28	0.02	0.52	0.04	99.87	0.74
		49.62	1.20	4.17	0.21	9.17	15.55	18.75	0.35	0.01	0.76	0.00	99.80	0.75
		52.01	0.56	1.96	0.20	9.74	18.28	16.27	0.18	0.00	0.39	0.00	99.60	0.77
SEG31A-1-1 (Piece 1E, 61–65)	Average Standard	50.11	1.04	3.66	0.21	9.56	16.23	17.89	0.27	0.01	0.60	0.02	99.60	0.75
		1.28	0.32	1.14	0.02	0.34	1.40	1.38	0.07	0.01	0.18	0.02		0.01
		49.62	1.23	3.35	0.22	9.80	15.11	18.91	0.23	0.00	0.22	0.00	98.70	0.73
		49.68	1.09	3.54	0.16	8.61	15.07	20.07	0.27	0.00	0.79	0.00	99.27	0.76
		51.71	0.64	1.92	0.07	9.71	17.61	16.15	0.24	0.00	0.38	0.02	98.45	0.76
SEG41A-1-1 (Piece 1C, 16–20)	Average Standard	51.28	0.72	1.91	0.22	8.47	16.76	18.58	0.25	0.00	0.50	0.05	98.74	0.78
		50.57	0.92	2.68	0.17	9.15	16.14	18.43	0.25	0.00	0.47	0.02	98.79	0.76
		1.08	0.29	0.89	0.07	0.71	1.26	1.65	0.02	0.00	0.24	0.02		0.02
		50.60	0.67	2.11	0.24	10.07	15.82	19.22	0.30	0.00	0.18	0.02	99.24	0.74
		50.27	0.67	2.78	0.19	8.28	16.84	18.44	0.23	0.00	0.46	0.02	98.19	0.78
SEG42C-1-1 (Piece 5, 41–45)	Average Standard	49.92	0.62	2.96	0.17	7.31	16.64	19.99	0.28	0.00	0.43	0.04	98.38	0.80
		50.27	0.66	2.62	0.20	8.55	16.43	19.22	0.27	0.00	0.36	0.03	98.60	0.77
		0.34	0.03	0.45	0.04	1.40	0.54	0.77	0.03	0.00	0.15	0.01		0.03
		51.26	0.55	4.56	0.17	5.20	15.78	20.26	0.24	0.00	1.34	0.01	99.39	0.84
		52.95	0.29	2.45	0.10	5.23	17.77	19.74	0.15	0.03	0.68	0.00	99.39	0.86
SEG45A-1-1 (Piece 6, 45–49)	Average Standard	53.58	0.30	2.38	0.15	5.05	17.41	20.06	0.15	0.00	0.74	0.00	99.81	0.86
		52.59	0.38	3.13	0.14	5.16	16.99	20.02	0.18	0.01	0.92	0.00	99.53	0.85
		1.20	0.15	1.24	0.04	0.10	1.06	0.27	0.05	0.02	0.37	0.01		0.01
		49.16	0.77	4.94	0.12	7.07	15.91	19.39	0.18	0.00	0.64	0.01	98.19	0.80
		51.02	0.73	4.90	0.09	6.82	16.01	19.76	0.22	0.00	0.77	0.00	100.33	0.81
		53.99	0.30	2.09	0.24	7.46	18.86	17.02	0.10	0.01	0.41	0.02	100.51	0.82
		51.64	0.38	1.95	0.24	7.59	19.34	17.25	0.12	0.00	0.31	0.00	98.82	0.82
		49.68	0.53	4.17	0.13	6.24	16.28	20.30	0.21	0.01	1.25	0.07	98.86	0.82
		51.98	0.50	4.45	0.12	6.23	16.54	19.27	0.28	0.02	1.07	0.02	100.47	0.83
		51.97	0.57	4.43	0.04	6.01	16.13	20.59	0.25	0.04	1.15	0.09	101.25	0.83

Table AT3 (continued).

Hole, core, section, interval (cm)	Texture	Major element oxides (wt%)												Total	Mg#
		SiO ₂	TiO ₂	Al ₂ O ₃	MnO	FeO	MgO	CaO	Na ₂ O	K ₂ O	Cr ₂ O ₃	NiO			
SEG51C-1-1 (Piece 6, 25–29)	Average	51.99	0.52	4.35	0.16	5.89	15.96	20.40	0.27	0.00	1.18	0.14	100.84	0.83	
		49.28	0.55	3.84	0.18	5.91	16.20	20.53	0.26	0.00	1.11	0.01	97.88	0.83	
		49.49	0.51	3.92	0.06	5.91	16.29	20.63	0.25	0.03	1.24	0.05	98.36	0.83	
		51.02	0.54	3.90	0.14	6.51	16.75	19.51	0.21	0.01	0.91	0.04	99.55	0.82	
		1.59	0.14	1.06	0.07	0.67	1.26	1.35	0.06	0.01	0.35	0.05		0.01	
	Standard	46.06	2.85	7.34	0.17	10.50	12.55	19.47	0.50	0.00	0.07	0.09	99.60	0.68	
		46.99	2.80	6.77	0.15	10.09	12.56	19.17	0.47	0.00	0.01	0.00	99.01	0.69	
		47.34	2.60	6.84	0.14	9.33	12.83	19.83	0.49	0.02	0.15	0.05	99.63	0.71	
		47.98	2.15	5.59	0.21	9.60	13.25	20.46	0.41	0.00	0.10	0.04	99.79	0.71	
		51.97	1.08	2.87	0.27	8.86	16.27	18.44	0.31	0.00	0.02	0.00	100.08	0.77	
SEG52A-1-1 (Piece 2B, 16–20)	Average	48.07	2.29	5.88	0.19	9.67	13.49	19.48	0.44	0.00	0.07	0.04	99.62	0.71	
		2.29	0.73	1.80	0.05	0.64	1.58	0.75	0.08	0.01	0.06	0.04		0.03	
		48.63	1.50	4.74	0.18	9.88	14.29	18.99	0.43	0.02	0.15	0.00	98.81	0.72	
		49.73	1.28	3.43	0.22	9.88	15.14	20.19	0.33	0.00	0.06	0.00	100.26	0.73	
		50.30	0.90	3.34	0.21	8.18	15.70	20.65	0.31	0.01	0.16	0.00	99.76	0.77	
	Standard	50.80	0.91	2.80	0.21	7.89	15.75	20.38	0.27	0.00	0.01	0.04	99.06	0.78	
		50.92	0.83	2.69	0.21	7.73	15.52	20.76	0.33	0.00	0.15	0.00	99.13	0.78	
		50.07	1.09	3.40	0.20	8.71	15.28	20.19	0.33	0.01	0.11	0.01	99.41	0.76	
		0.94	0.29	0.82	0.02	1.08	0.60	0.71	0.06	0.01	0.07	0.02		0.03	
		53B-1-1 (Piece 2, 85-115)	Average	49.59	1.00	1.57	0.36	13.12	13.36	17.92	0.29	0.00	0.00	0.12	97.34
47.15	1.20			4.07	0.22	9.94	13.74	19.43	0.31	0.02	0.15	0.11	96.34	0.71	
48.53	1.02			2.54	0.19	9.76	15.18	19.09	0.20	0.01	0.15	0.00	96.66	0.73	
47.83	1.11			3.24	0.17	9.32	15.41	19.73	0.24	0.00	0.16	0.03	97.24	0.75	
49.02	0.90			2.93	0.18	8.46	15.70	20.57	0.26	0.01	0.14	0.20	98.38	0.77	
Standard	49.47		1.05	3.91	0.20	8.22	15.65	20.17	0.21	0.03	0.46	0.00	99.37	0.77	
	49.36		0.94	3.91	0.23	8.17	15.74	20.30	0.27	0.00	0.41	0.00	99.34	0.77	
	51.06		0.65	2.21	0.12	8.79	17.54	17.96	0.20	0.03	0.22	0.00	98.78	0.78	
	51.48		0.57	2.01	0.16	8.55	18.15	17.56	0.21	0.00	0.23	0.00	98.92	0.79	
	50.35		0.70	3.14	0.10	7.16	16.02	20.56	0.27	0.04	0.39	0.00	98.72	0.80	
SEG54A-1-1 (Piece 3, 14–18)	Average	48.22	0.66	2.67	0.12	7.14	16.51	20.30	0.27	0.01	0.42	0.02	96.33	0.80	
		49.25	0.88	3.06	0.17	8.55	15.96	19.57	0.24	0.01	0.27	0.04	98.01	0.77	
		1.40	0.22	0.73	0.04	0.96	1.23	1.07	0.04	0.01	0.13	0.07		0.03	
		48.04	1.52	4.74	0.07	9.21	14.82	19.13	0.31	0.00	0.15	0.00	97.99	0.74	
		50.01	1.07	3.28	0.11	7.55	15.53	20.78	0.35	0.00	0.29	0.00	98.98	0.79	
	Standard	50.30	0.89	3.01	0.21	7.31	15.84	21.34	0.30	0.00	0.26	0.01	99.50	0.79	
		49.90	0.87	3.55	0.25	6.79	15.72	20.41	0.31	0.01	0.37	0.09	98.27	0.80	
		49.56	1.09	3.65	0.16	7.72	15.48	20.42	0.32	0.00	0.27	0.03	98.68	0.78	
		1.03	0.30	0.76	0.08	1.05	0.46	0.94	0.02	0.01	0.09	0.04		0.03	
		SEG58A-1-1 (Piece 1C, 9–13)	Average	51.46	0.91	1.88	0.31	11.02	15.99	17.64	0.19	0.00	0.01	0.00	99.42
48.96	1.29			4.04	0.17	9.48	14.80	18.95	0.30	0.00	0.43	0.00	98.41	0.74	
49.50	1.30			3.35	0.16	9.76	15.34	18.25	0.30	0.00	0.25	0.01	98.22	0.74	
49.97	1.17			3.09	0.21	10.09	15.38	18.28	0.26	0.00	0.23	0.00	98.68	0.73	
1.32	0.22			1.10	0.08	0.82	0.59	0.65	0.06	0.00	0.21	0.00		0.56	
SEG60B-1-1 (Piece 6A, 93–97)	Average	49.08	1.50	4.06	0.18	8.48	14.57	20.24	0.36	0.03	0.41	0.02	98.94	0.75	
		49.72	0.89	4.11	0.08	5.90	15.39	21.70	0.30	0.00	0.77	0.01	98.87	0.82	
		49.97	1.14	3.37	0.07	6.98	15.55	20.71	0.27	0.00	0.55	0.01	98.62	0.80	
		49.59	1.18	3.85	0.11	7.12	15.17	20.88	0.31	0.01	0.58	0.01	98.81	0.79	

Table AT3 (continued).

Hole, core, section, interval (cm)	Texture	Major element oxides (wt%)											Total	Mg#
		SiO ₂	TiO ₂	Al ₂ O ₃	MnO	FeO	MgO	CaO	Na ₂ O	K ₂ O	Cr ₂ O ₃	NiO		
SEG61B-1-1 (Piece 1B, 19–23)	Standard	0.46	0.31	0.41	0.06	1.30	0.52	0.74	0.04	0.02	0.18	0.01		0.04
		48.22	2.12	4.65	0.15	8.71	14.24	20.58	0.33	0.00	0.55	0.10	99.66	0.74
		51.12	1.07	2.35	0.19	9.14	15.24	20.87	0.25	0.00	0.05	0.00	100.27	0.75
		50.91	1.07	2.76	0.26	8.58	15.26	20.99	0.27	0.00	0.20	0.01	100.30	0.76
		50.08	1.42	3.25	0.20	8.81	14.91	20.81	0.28	0.00	0.27	0.04	100.08	0.75
SEG61B-1-1 (Piece 8, 95–99)	p-mi	1.62	0.61	1.23	0.05	0.30	0.58	0.21	0.04	0.00	0.26	0.06		0.01
		50.06	1.31	2.64	0.29	9.00	14.88	20.71	0.30	0.00	0.12	0.04	99.36	0.75
		49.38	1.30	3.13	0.17	8.45	14.56	19.89	0.30	0.00	0.30	0.00	97.47	0.75
		49.59	1.45	3.38	0.21	7.95	15.10	20.30	0.36	0.00	0.39	0.03	98.77	0.77
		49.67	1.36	3.05	0.22	8.46	14.85	20.30	0.32	0.00	0.27	0.02	98.53	0.76
SEG62A-1-1 (Piece 2, 13–17)	Standard	0.35	0.08	0.37	0.06	0.53	0.27	0.41	0.04	0.00	0.14	0.02		0.01
		49.92	1.21	3.29	0.23	8.07	14.27	19.55	0.28	0.07	0.50	0.09	97.47	0.76
		49.08	1.26	3.69	0.21	7.72	14.98	20.30	0.31	0.02	0.69	0.09	98.35	0.78
		48.96	1.41	4.11	0.16	7.62	14.80	19.84	0.35	0.00	0.64	0.02	97.91	0.78
		49.35	1.41	3.88	0.01	7.70	15.15	19.65	0.32	0.00	0.80	0.00	98.25	0.78
SEG63A-1-1 (Piece 3, 18–20)	Average	49.12	1.42	4.06	0.16	7.53	15.03	19.40	0.34	0.00	0.73	0.00	97.78	0.78
		49.29	1.34	3.81	0.15	7.73	14.84	19.75	0.32	0.02	0.67	0.04	97.95	0.77
		0.38	0.10	0.33	0.09	0.20	0.34	0.35	0.03	0.03	0.11	0.04		0.01
		46.63	2.27	6.03	0.12	8.70	13.05	19.86	0.30	0.02	0.16	0.01	97.14	0.73
		49.76	1.14	3.19	0.11	8.22	15.59	18.98	0.27	0.04	0.02	0.00	97.32	0.77
SEG64B-1-1 (Piece 1, 0–4)	dol	50.46	0.85	2.51	0.16	7.08	16.05	19.25	0.21	0.02	0.19	0.00	96.75	0.80
		48.95	1.42	3.91	0.13	8.00	14.89	19.36	0.26	0.03	0.12	0.01	97.07	0.77
		2.04	0.75	1.87	0.02	0.84	1.62	0.45	0.04	0.01	0.09	0.01		0.04
		48.36	2.36	4.18	0.33	12.26	13.39	19.33	0.43	0.03	0.06	0.00	100.73	0.66
		48.63	2.16	3.71	0.24	10.46	13.38	19.45	0.35	0.01	0.04	0.00	98.42	0.70
SEG70A-1-1 (Piece 6D, 62–68)	p-mi	51.19	1.30	1.84	0.33	11.42	15.01	19.04	0.28	0.01	0.05	0.00	100.47	0.70
		51.16	1.01	2.00	0.25	10.63	15.72	19.02	0.19	0.02	0.11	0.03	100.15	0.72
		49.84	1.71	2.93	0.29	11.19	14.38	19.21	0.31	0.02	0.07	0.01	99.94	0.70
		1.55	0.65	1.19	0.05	0.83	1.18	0.21	0.10	0.01	0.03	0.01		0.03
		49.86	0.79	3.02	0.27	9.08	16.03	19.47	0.21	0.00	0.32	0.05	99.10	0.76
SEG71A-1-1 (Piece 2C, 285–325)	dol	50.49	0.54	2.70	0.16	9.90	17.69	16.14	0.27	0.00	0.16	0.05	98.11	0.76
		50.36	0.64	2.78	0.25	8.34	16.97	19.90	0.29	0.03	0.28	0.06	99.90	0.78
		50.24	0.66	2.83	0.23	9.11	16.90	18.50	0.25	0.01	0.25	0.05	99.04	0.77
		0.34	0.13	0.17	0.05	0.78	0.83	2.06	0.04	0.02	0.08	0.01		0.01
		49.90	1.06	1.75	0.41	17.27	13.06	17.17	0.28	0.02	0.03	0.00	100.95	0.57
SEG71A-1-1 (Piece 2C, 285–325)	Average	50.28	1.15	2.17	0.35	14.30	13.80	18.06	0.29	0.00	0.11	0.00	100.50	0.63
		50.58	0.90	2.26	0.26	12.39	14.56	19.11	0.24	0.01	0.02	0.00	100.31	0.68
		51.67	0.71	1.62	0.29	10.61	15.80	18.89	0.28	0.00	0.07	0.09	100.03	0.73
		51.83	0.60	1.82	0.25	10.36	16.46	18.15	0.24	0.00	0.00	0.01	99.73	0.74
		52.45	0.57	1.83	0.24	9.95	16.99	18.28	0.20	0.00	0.05	0.00	100.57	0.75
		52.65	0.55	1.73	0.15	8.60	16.80	19.42	0.22	0.01	0.03	0.03	100.18	0.78
		51.84	0.67	1.85	0.24	10.38	16.12	18.77	0.24	0.00	0.03	0.02	100.16	0.73
		0.81	0.15	0.24	0.05	1.36	0.98	0.54	0.03	0.00	0.03	0.04		0.04

Notes: mi = microphenocryst, p-mi = phenocryst to microphenocryst, dol = dolerite. * = analysis excluded from calculation of average.

Table AT4. Microprobe analyses of olivine phenocrysts.

Hole, core, section, interval (cm)	Texture	Major element oxides (wt%)								Total	Mg#
		SiO ₂	FeO	MnO	MgO	CaO	Cr ₂ O ₃	NiO			
163X-											
SEG44A-1-1 (Piece 1B, 39–41)		35.92	28.43	0.34	34.67	0.36	0.18	0.22	100.13	0.68	
		37.98	25.02	0.40	38.35	0.31	0.01	0.14	102.21	0.73	
		38.05	23.79	0.34	38.17	0.30	0.07	0.08	100.79	0.74	
		37.14	24.09	0.35	39.37	0.32	0.00	0.09	101.36	0.74	
		37.15	23.67	0.29	38.78	0.34	0.00	0.02	100.24	0.74	
		37.49	23.71	0.31	38.98	0.35	0.00	0.07	100.90	0.75	
		38.26	22.92	0.37	38.48	0.33	0.04	0.08	100.49	0.75	
		37.98	23.26	0.27	39.33	0.33	0.05	0.08	101.31	0.75	
		37.56	22.99	0.35	38.90	0.36	0.03	0.13	100.32	0.75	
		38.08	22.83	0.36	39.49	0.27	0.00	0.18	101.20	0.76	
	Average	37.74	23.59	0.34	38.87	0.32	0.02	0.10	100.98	0.75	
	Standard	0.42	0.69	0.04	0.47	0.03	0.03	0.05		0.01	
SEG56B-1-1 (Piece 4, 14–18)		36.08	28.42	0.26	34.54	0.27	0.02	0.01	99.62	0.68	
		36.29	27.63	0.41	35.73	0.34	0.03	0.08	100.52	0.70	
		35.85	27.21	0.41	35.62	0.32	0.05	0.07	99.53	0.70	
	Average	36.07	27.76	0.36	35.30	0.31	0.04	0.05	99.89	0.69	
	Standard	0.22	0.62	0.09	0.66	0.03	0.01	0.04		0.01	
SEG57A-1-1 (Piece 5, 18–22)		36.47	34.63	0.64	29.44	0.38	0.00	0.06	101.62	0.60	
		35.45	34.63	0.59	29.60	0.42	0.07	0.00	100.76	0.60	
		35.87	33.93	0.50	29.49	0.39	0.01	0.08	100.27	0.61	
		36.60	32.59	0.50	32.01	0.38	0.00	0.13	102.20	0.64	
		37.22	29.89	0.42	33.97	0.35	0.00	0.09	101.93	0.67	
	Average	36.32	33.13	0.53	30.90	0.38	0.02	0.07	101.36	0.62	
	Standard	0.69	2.00	0.09	2.03	0.03	0.03	0.05		0.03	
SEG58A-1-1 (Piece 1C, 9–13)		36.24	36.91	0.53	28.96	0.27	0.03	0.09	103.03	0.58	
		35.87	35.31	0.43	29.17	0.25	0.00	0.02	101.05	0.60	
		36.01	33.92	0.48	30.20	0.38	0.01	0.09	101.08	0.61	
		35.93	30.83	0.42	32.74	0.33	0.00	0.12	100.37	0.65	
	Average	36.01	34.24	0.47	30.27	0.31	0.01	0.08	101.38	0.61	
	Standard	0.16	2.58	0.05	1.74	0.06	0.02	0.04		0.03	
SEG61B-1-1 (Piece 1B, 19–23)	gr	34.71	40.79	0.55	24.83	0.31	0.01	0.07	101.26	0.52	
		35.23	39.46	0.40	25.69	0.30	0.00	0.05	101.13	0.54	
		35.82	37.94	0.47	27.20	0.28	0.07	0.00	101.77	0.56	
	Average	35.25	39.39	0.47	25.91	0.30	0.02	0.04	101.39	0.54	
	Standard	0.55	1.43	0.07	1.20	0.02	0.04	0.03		0.02	
SEG61B-1-1 (Piece 8, 95–99)		36.53	30.31	0.50	31.94	0.30	0.00	0.04	99.61	0.65	
		36.82	27.80	0.40	34.29	0.32	0.00	0.21	99.84	0.69	
		37.04	26.45	0.40	35.54	0.30	0.01	0.09	99.83	0.71	
	Average	36.79	28.18	0.43	33.92	0.31	0.01	0.11	99.76	0.68	
	Standard	0.26	1.96	0.05	1.82	0.01	0.01	0.09		0.03	
SEG64B-1-1 (Piece 1, 0–4)	dol	37.08	32.84	0.43	31.36	0.31	0.02	0.11	102.15	0.63	
		37.37	31.13	0.36	33.49	0.33	0.00	0.12	102.80	0.66	
		37.28	29.43	0.33	34.18	0.34	0.00	0.10	101.67	0.67	
		37.33	28.62	0.29	34.81	0.30	0.02	0.04	101.42	0.68	
		37.75	28.29	0.25	35.22	0.27	0.00	0.10	101.89	0.69	
		37.43	27.92	0.56	35.30	0.32	0.00	0.16	101.69	0.69	
		37.54	27.50	0.42	35.23	0.33	0.00	0.10	101.11	0.70	
		37.87	26.69	0.29	35.18	0.32	0.02	0.16	100.52	0.70	
		37.95	27.33	0.46	36.06	0.26	0.01	0.20	102.26	0.70	
	Average	37.57	28.36	0.37	34.93	0.31	0.01	0.12	101.67	0.69	
	Standard	0.26	1.40	0.10	0.78	0.03	0.01	0.05		0.02	
SEG76B-1-1 (Piece 2B, 8–10)		36.11	28.61	0.36	34.79	0.42	0.33	0.13	100.73	0.68	

Notes: gr = groundmass, dol = dolerite. * = analysis excluded from calculation of average.

Table AT5. Microprobe analyses of chromian spinel phenocrysts.

Hole, core, section, interval (cm)	Texture	Major element oxides (wt%)														
		SiO ₂	TiO ₂	Al ₂ O ₃	Fe ₂ O ₃	FeO	MnO	MgO	CaO	Cr ₂ O ₃	NiO	FeO*	Total	Al#	Fe3#	Cr#
SEG40A-1-2 (Piece 1, 10–14)	incl/ol	0.00	1.24	13.66	15.33	19.86	0.32	9.73	0.01	40.03	0.15	33.66	100.33	0.272	0.195	0.534
		0.00	1.14	13.26	14.46	20.38	0.37	9.18	0.00	40.91	0.13	33.40	99.84	0.266	0.185	0.550
		0.00	0.42	16.98	13.39	21.23	0.33	8.26	0.02	37.31	0.08	33.28	98.02	0.336	0.169	0.495
		0.00	0.28	18.91	9.74	20.39	0.25	9.27	0.00	40.32	0.12	29.15	99.28	0.362	0.119	0.518
	Average Standard	0.00	0.77	15.70	13.23	20.47	0.32	9.11	0.01	39.64	0.12	32.37	99.37	0.309	0.167	0.524
		0.00	0.49	2.71	2.46	0.57	0.05	0.62	0.01	1.60	0.03	2.15		0.047	0.034	0.023
SEG43A-1-1 (Piece 4, 11–15)	incl/ol	0.00	0.40	26.89	5.69	14.46	0.11	14.05	0.05	37.06	0.08	19.58	98.79	0.486	0.066	0.449
		0.00	0.32	25.93	6.36	13.69	0.12	14.18	0.07	37.24	0.15	19.42	98.05	0.472	0.074	0.454
		0.00	0.83	23.14	9.03	18.82	0.22	10.68	0.05	34.56	0.07	26.94	97.40	0.444	0.111	0.445
		0.00	0.51	25.32	7.03	15.66	0.15	12.97	0.06	36.28	0.10	21.980	98.08	0.467	0.084	0.449
	Average Standard	0.00	0.28	1.95	1.77	2.77	0.06	1.98	0.01	1.50	0.04	4.30				
SEG44A-1-1 (Piece 1B, 38–42)	incl/ol	0.00	2.48	16.38	16.69	24.92	0.34	6.61	0.05	29.01	0.13	39.94	96.62	0.352	0.229	0.418
		0.00	2.71	16.24	16.12	25.36	0.38	6.52	0.00	29.39	0.11	39.87	96.82	0.351	0.223	0.426
	Average Standard	0.00	2.59	16.31	16.43	25.12	0.36	6.57	0.02	29.20	0.12	39.90	96.72	0.352	0.226	0.422
SEG76B-1-1 (Piece 3, 18–19)	incl/ol	0.00	0.91	15.78	9.06	15.85	0.29	12.42	0.01	45.65	0.13	24.01	100.09	0.302	0.111	0.587
		0.00	0.94	16.41	7.97	18.33	0.37	10.82	0.00	45.10	0.18	25.51	100.11	0.317	0.098	0.585
		0.00	1.23	17.98	3.10	17.19	0.18	11.37	0.07	45.64	0.14	19.98	96.90	0.356	0.039	0.605
		0.00	0.86	15.65	8.28	20.46	0.25	9.36	0.05	44.95	0.10	27.91	99.96	0.306	0.103	0.590
		0.00	0.95	15.90	7.66	14.52	0.24	12.73	0.02	45.31	0.32	21.41	97.66	0.311	0.096	0.594
		0.00	0.98	16.34	7.21	17.27	0.27	11.34	0.03	45.33	0.17	23.76	98.95	0.318	0.089	0.592
	Average Standard	0.00	0.15	0.96	2.36	2.29	0.07	1.35	0.03	0.32	0.09	3.17		0.022	0.029	0.008
SEG77A-1-1 (Piece 3, 22–26)	incl/ol	0.00	0.97	13.70	5.39	14.27	0.07	12.71	0.02	49.15	0.05	19.12	96.32	0.273	0.069	0.658
		0.00	0.70	13.30	16.35	9.51	0.27	15.68	0.05	42.08	0.10	24.23	98.05	0.256	0.201	0.543
		0.00	0.88	11.03	20.42	20.31	0.67	8.19	0.04	36.26	0.06	38.69	97.85	0.228	0.270	0.503
		0.00	0.85	12.68	14.05	14.70	0.34	12.19	0.04	42.50	0.07	27.34	97.40	0.252	0.180	0.568
	Average Standard	0.00	0.14	1.44	7.77	5.41	0.30	3.78	0.02	6.46	0.03	10.15		0.023	0.102	0.080

Note: incl/ol = inclusion in olivine phenocryst.

Table AT6. Point-counted modal analyses of lavas. (See table note. Continued on next page.)

Hole, core, section, interval (cm)	Phenocryst assemblages				Groundmass						Vesicles	
	Plagioclase	Clinopyroxene	Olivine	Chromite	Plagioclase	Clinopyroxene	Olivine	Oxide	Mesostasis	Undifferentiated	Filled	Unfilled
163X-												
SEG01A-1-1, 57–61	9.5	4.45	0.2	—	34.25	39.8	—	8.4	3.1	—	0.3	
SEG01A-2-1, 60–65	11.55	6.75	—	—	37.9	36	—	7.1	0.7	—	2	1.4
SEG01A-2-1, 61–66	9.9	5.5	—	—	47.6	27.95	—	5.4	0.25	—	0.7	—
SEG02A-6-1, 29–34	3.55	2.15	—	—	50.4	30.55	—	8.55	4.1	—	—	—
SEG02A-7-1, 46–50	1.5	0.55	—	—	—	—	—	—	—	97.35	—	0.6
SEG04B-1-1 (Piece 6, 60–64)	0.5	1.75	—	—	53.2	32.75	—	7.85	3.15	—	0.7	0.1
SEG05B-1-1 (Piece 3B, 41–45)	23.7	1.15	1.1	—	39.4	24.65	—	7.2	1.6	—	1.1	0.1
SEG05B-1-1 (Piece 3B, 98–102)	31.05	—	1.8	—	35.35	15.9	3.55	9.55	2.05	—	0.75	—
SEG10B-1-1 (Piece 2G, 94–98)	—	—	—	—	—	—	—	—	—	—	—	—
SEG11A-1-1 (Piece 2, 11–15)	14.3	1.3	—	—	39.5	35.75	—	7.5	1.05	—	0.6	—
SEG12A-1-1 (Piece 1A, 0–4)	1.6	0.7	0.25	—	46.1	37.7	—	8.6	—	—	4.65	0.4
SEG21D-1-1 (Piece 1A, 9–13)	5.15	1.15	1.85	—	42.95	39.65	—	8.85	0.4	—	—	—
SEG22A-1-1 (Piece 3A, 15–19)	9.95	2.2	—	—	43.05	36.55	—	6.75	4.55	—	—	—
SEG23A-1-1 (Piece 1, 0–4)	7.65	2.5	—	—	45.45	33.7	2.8	7	0.9	—	—	—
SEG24A-1-1 (Piece 2, 4–8)	6.05	5.1	—	—	35.7	44.2	—	7.4	1.55	—	—	—
SEG26A-1-1 (Piece 6G, 85–89)	15.4	4.2	—	—	26.95	44.35	—	8.85	—	—	0.2	0.05
SEG27A-1-1 (Piece 5A, 47–51)	19.8	2.15	—	—	34.95	31.25	—	5.2	1.15	—	1	4.5
SEG28A-1-1 (Piece 5, 28–32)	16.85	3.7	2.4	—	41.35	27.6	—	6.65	0.75	—	—	0.7
SEG29A-1-1 (Piece 4B, 26–30)	5.45	0.8	0.9	—	44.7	29.2	—	9.95	0.15	—	7.6	1.25
SEG31A-1-1 (Piece 1E, 61–65)	16.2	4.7	2.15	—	42.95	26.3	—	6.6	—	—	0.95	0.15
SEG36A-1-1 (Piece 2B, 11–15)	0.75	3.95	5.6	—	33.65	30.3	17.5	2.55	—	—	5.3	0.4
SEG40A-1-2 (Piece 1, 10–14)	1.4	0.85	10.9	1.1	—	—	—	—	—	85.05	0.7	—
SEG41A-1-1 (Piece 1C, 16–20)	13.05	1	2.4	—	43.35	32.4	—	7.55	—	—	0.2	0.05
SEG42B-1-1 (Piece 2, 7–8)	25.65	—	22.1	—	—	—	—	—	—	48.8	3.45	—
SEG42C-1-1 (Piece 5, 41–45)	16.2	1.65	8.45	—	—	—	—	—	—	65.65	2.65	5.4
SEG43A-1-1 (Piece 4, 11–15)	18.65	0.8	15.7	—	33.4	23.1	—	1.65	—	—	6.35	0.85
SEG44A-1-1 (Piece 1B, 38–42)	—	—	2.2	—	54.7	26.35	9.95	6.4	—	—	0.4	—
SEG45A-1-1 (Piece 6, 45–49)	4.2	2.3	4.55	—	—	—	—	—	—	72.3	9.1	7.55
SEG47A-1-1 (Piece 9, 70–74)	0.2	0.65	1.6	—	49.1	35.95	—	4.55	—	—	7.7	0.25
SEG51C-1-1 (Piece 6, 25–29)	3	7.35	—	—	—	—	—	—	—	86.5	2.9	0.25
SEG52A-1-1 (Piece 2B, 16–20)	0.95	0.8	—	—	56.3	33.85	—	6.25	—	—	1.85	—
SEG53B-1-1 (Piece 2, 8.5–11.5)	4.75	1.85	—	—	53.15	33.55	—	5	2	—	0.1	0.1
SEG54A-1-1 (Piece 3, 14–18)	0.75	2.95	0.2	—	53.9	34.7	—	7.05	—	—	0.45	—
SEG55B-1-1 (Piece 4, 27–31)	1.5	—	—	—	50.3	37.95	—	5.2	—	—	4.7	0.35
SEG56A-1-1 (Piece 4, 14–18)	12.9	0.35	2.4	—	41.9	32.25	2.7	5.75	1.3	—	0.45	—
SEG57A-1-1 (Piece 5, 18–22)	2.05	0.45	1.6	—	53.15	31.14	—	9.9	1.25	—	0.2	—
SEG58A-1-1 (Piece 1C, 9–13)	20	3.5	4	—	31.25	29.9	—	8.85	1.25	—	1.1	—
SEG60B-1-1 (Piece 6A, 93–97)	7.4	0.9	1.95	—	40.3	35.2	—	8.15	1.8	—	2.8	1.5
SEG61B-1-1 (Piece 1B, 19–23)	2.2	0.8	—	—	51.55	36.05	1.75	5.75	1.8	—	0.1	—
SEG61B-1-1 (Piece 8, 95–102)	—	—	—	—	—	—	—	—	—	—	—	—
SEG62A-1-1 (Piece 2, 13–17)	7.85	2.45	—	—	49.25	33.65	—	5.6	0.75	—	0.35	0.1
SEG63A-1-1 (Piece 3, 18–20)	4.45	0.7	0.7	—	56.55	21.3	2.9	8.45	2.8	—	0.4	7.5
SEG64B-1-1 (Piece 1, 0–4)	1.2	1.4	0.05	—	53.65	37.1	0.5	5.6	—	—	0.5	—
SEG65B-1-1 (Piece 4, 23–24)	6.85	7.8	2.05	—	40.1	28.05	2.7	9.95	—	—	0.85	0.5
SEG70A-1-1 (Piece 6D, 62–66)	20.9	2.9	1.55	—	30.6	31.2	5.2	2.15	—	—	4.75	—

Table AT6 (continued).

Hole, core, section, interval (cm)	Phenocryst assemblages				Groundmass						Vesicles	
	Plagioclase	Clinopyroxene	Olivine	Chromite	Plagioclase	Clinopyroxene	Olivine	Oxide	Mesostasis	Undifferentiated	Filled	Unfilled
SEG71A-1-1 (Piece 2C, 28.5–32.5)												
SEG76A-1-1 (Piece 2B, 8–11)	—	—	—	—							2	1.1
SEG76B-1-1 (Piece 3, 0–4)	—	—	26.75	—	27.45	33.75	7.5	1.45	—	—	3.2	2.1
SEG77A-1-1 (Piece 3, 22–26)	13.1	—	—	0.55	—	—	—	—	—	79.5		

Note: — = no data.