INTERAGENCY REPORT: 27

Documentation of the Apollo 14 samples

by

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J. P. Schafer, and R. L. Sutton

April 1971

This report is preliminary and has not been edited or reviewed for conformity with U.S. Geological Survey standards and nomenclature.

Prepared by the Geological Survey for the National Aeronautics and Space Administration
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Figure 22. Orthogonal views of sample 14321, shown in approximate lunar orientation.
This report was prepared for the purpose of illustrating the regional and local environments, and the locations and lunar orientations of the documented samples returned by Apollo 14. All of the illustrations are taken from the Preliminary Science Report ("Ninety-day report") submitted to the National Aeronautics and Space Administration by the Apollo Lunar Geologic Investigation (S-059) team (Swann et al., 1971).
Figure 1. Regional geologic map of the area surrounding the Apollo 14 landing site (simplified from Wilhelms and McCauley, 1971).
EXPLANATION

Materials of major post-Fra Mauro craters

Dark mantling material

Young mare basalt

Old mare basalt

Pre-mare plains-forming material

Alpes Formation

Fra Mauro Formation

Materials of mountains rimming the Imbrium Basin

Undivided terra materials

Mostly pre-Fra Mauro materials, but includes some later crater deposits and probable volcanic rocks
Figure 2. Map of major geologic features in Apollo 14 traverse area. Origin of geologic units is described in the Apollo 14 pre-mission maps by Eggleton and Offield (1970). (Base map prepared by Topographic Command, U.S. Army.)
EXPLANATION

Materials of Cone Crater

Smooth terrain material of the Fra Mauro Formation

Ridge material of the Fra Mauro Formation

Contact

Long dashed where approximately located. Short dashed where location is inferred without local evidence

Foot of scarp

Bounds small mesa. Triangles point down slope. Short dashed where location inferred

Edge of hill

Long dashed where approximately located. Short dashed where location inferred. Triangles point down slope

 Traverse route for EVA's 1 and 2

Stations

OB  Panorama station
OG1 Station without panorama
C/S ALSEP Central Station
LR3 Laser Ranging Retroreflector

Samples

FSR  Football-sized rock
• Cont Spl  Contingency sample
• Comp Spl  Comprehensive sample
Dg  Grab sample at Station D
Figure 3. Rock distribution map. (Base map prepared by Topographic Command, U.S. Army.)
Rock Distribution Map

Explanation

Large Rocks

■ 8-16 meter diameter
〇 4-8 meter diameter
▲ 2-4 meter diameter
● 1-2 meter diameter

Boundary of area where rocks are obscured by poor lighting--mostly inside Cone crater

Small Rocks

Distribution of rocks within 10 meter radius of panorama station. Rocks shown by solid pattern.

Traverse and station symbols same as on Geologic Map
Figure 4. Traverse map showing sample and photograph locations. (Base map prepared by Topographic Command, U.S. Army.)
Sample Map

Explanation

Bag 6N  Pre-numbered sample bag
14307  Sample for which location is "known" by reference to sample bags used at the time of collection
14306 (O)  Sample for which location and lunar orientation known
14318 (T)  Sample for which location is tentative, based on identification of sample in lunar surface photographs
14310 (?)  Sample for which location is tentative based on description by the astronauts, the process of elimination of known samples, or the possibility of sample mixing during transfer between or within weigh bags
(grab)  Sample which was not photographed before sampling or put into pre-numbered bags
CT #1T  Core tube number 1 with a tab (not "tentative")
DP 9409-  Sample documentation photograph numbers
PAN 9049-  Panorama photograph numbers
SESC  Special environmental sample

Traverse and station symbols same as on Geologic Map
Figure 5. Sample number 14047 before collection (enlargement of NASA photograph AS14-64-9073).
Figure 6. Orthogonal views of sample number 14047, shown in approximate lunar orientation. NASA photograph numbers are shown in the schematic diagram.
Figure 7. Sample number 14051, showing approximate lunar orientation reconstructed in the LRL using oblique lighting. The reconstruction is superimposed on NASA photograph AS14-68-9443 taken before sample collection.
Figure 8. Orthogonal views of sample number 14051, shown in approximate lunar orientation. NASA photograph numbers are shown in the schematic diagram.
Figure 9. Orthogonal views of sample number 14053. NASA photograph numbers are shown in the schematic diagram. The lunar orientation of the rock is not known, but weathered and unweathered portions of the rock suggest a burial line.
Figure 10. Samples 14068-14072 (rocks) and 14144 (fines) photographed before collection (NASA photograph AS14-64-9126). Tentative correlations have been made between the four largest fragments and LRL photographs of the samples.
Figure 11. Sample number 14082, chipped from the white rocks. Geologic hammer is 40 cm long (NASA photograph AS14-68-9452).
Figure 12. Sample number 14305 showing approximate lunar orientation reconstructed in the LRL using oblique lighting. The reconstruction is superimposed on NASA photograph AS14-67-9393 taken before sample collection and before 14302 broke from 14305.
Figure 13. Orthogonal views of sample 14305, shown in approximate lunar orientation. NASA photograph numbers are shown in the schematic diagram.
Figure 14. Sample 14306, showing approximate lunar orientation reconstructed in the LRL using oblique lighting. The reconstruction is superimposed on NASA photograph AS14-68-9461 taken before sample collection.
Figure 15. Orthogonal views of sample 14306, shown in approximate lunar orientation. NASA photograph numbers are shown in the schematic diagram.
Figure 16. Sample 14313 and 14301 (tentatively identified) showing approximate lunar orientation reconstructed in the LRL using oblique lighting. The reconstruction is superimposed on NASA photograph AS14-68-9466 taken prior to collecting the sample.
Figure 17. Orthogonal views of sample 14313, shown in approximate lunar orientation. NASA photograph numbers are shown in the schematic diagram.
Figure 18. View of portion of North Boulder Field, Station H, showing tentative locations of samples 14318 and 14312, 14315 and 14318. "Turtle rock" in background. (NASA photograph AS14-68-9469.)
Figure 19. Turtle rock near Station H, showing samples from rock surface and fillet.
Figure 20. Orthogonal views of sample 14318, shown in approximate lunar orientation. NASA photograph numbers are shown in the schematic diagram.
Figure 21. Sample 14321, showing approximate lunar orientation reconstructed in the LRL using oblique lighting. The reconstruction is superimposed on NASA photograph AS14-64-9128 taken before sample collection.
Figure 22. Orthogonal views of sample 14321, shown in approximate lunar orientation. NASA photograph numbers are shown in the schematic diagram.
References


