QUARANTINE DOCUMENT SYSTEM

INDEXING PROCEDURE

INTERIM REPORT

Prepared Under
Contract NASw-2062

For
Headquarters
National Aeronautics and Space Administration
Planetary Quarantine Office
Washington, D.C. 20546

March 1972

by
EXOTECH SYSTEMS, INC.
525 School Street, S.W.
Washington, D.C. 20024
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>ACQUISITION</td>
<td>2</td>
</tr>
<tr>
<td>CATALOGING</td>
<td>6</td>
</tr>
<tr>
<td>INDEXING</td>
<td>6</td>
</tr>
<tr>
<td>STORAGE</td>
<td>7</td>
</tr>
<tr>
<td>RETRIEVAL</td>
<td>7</td>
</tr>
</tbody>
</table>

**APPENDIX A**  
A Complete Listing of the Collection

**APPENDIX B**  
Thesaurus Terms
INTRODUCTION

The Quarantine Document System (QDS) is a special purpose information system designed to collect and disseminate material pertinent to the mission of the Planetary Quarantine (PQ) Office of the National Aeronautics and Space Administration. In fulfilling its responsibility for the administration of the NASA Planetary Quarantine Program, the PQ Office must generate, receive and process extensive quantities of information and documentation related to the following:

- Contamination constraints and quarantine requirements
- Space Flight Project plans for fulfillment of such requirements
- Analyses and studies related to the establishment of quarantine requirements and to their fulfillment
- Execution of contamination and sterilization controls
- Verification that operational requirements have been met
- Compliance and certification of quarantine requirements.

To facilitate the handling of this information, the PQ Office contracted with Exotech Systems, Inc. for the design and implementation of the QDS. The basic functions of this system are to systematize the handling of planetary quarantine related information and to provide the NASA Planetary Quarantine Officer with a continuous, up-to-date overview of the status and

---


progress of pertinent quarantine activities in flight programs. The collection is organized to facilitate rapid access in response to general and specific queries.

An important function in the successful utilization of the QDS is the indexing procedure. Indexing must be sufficiently detailed to facilitate rapid retrieval, but not so complex that information requests must be subjected to specialized interpretation before retrievals can be conducted. A simple, yet effective QDS indexing procedure has been developed based upon a thesaurus of indexing terms evolved through actual use of the system.

This report describes the QDS indexing procedure and the thesaurus of terms used for this purpose.

The QDS consists of 6 functional elements, depicted in Figure 1, and described in the following paragraphs.

ACQUISITION

Acquisition involves identification, location, and collection (of referencing) of documents pertinent to the objectives of the system. Identification is performed through periodic searches of selected listings of potential sources such as:

- Flight project files within the PQ Office
- George Washington University Biological Sciences Communication Project (GWUBSCP) abstracts
Figure 1. Operations Elements of QDS
Figure 2. Acquisition Criteria
The acquisition criterion presented in Figure 2 is used to screen the collected material for retention. Acquisition decisions and status are indicated by means of stamps (see Figure 3) applied to the upper right hand corner of the documents. Copies are made as necessary and collected for entry into the QDS.

<table>
<thead>
<tr>
<th>Stamp Number</th>
<th>Symbol</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>![Symbol]</td>
<td>Document to be included in QDS</td>
</tr>
<tr>
<td>2</td>
<td>![Symbol]</td>
<td>Copy made for inclusion in QDS</td>
</tr>
</tbody>
</table>

Figure 3. Acquisition Accounting
CATALOGING

Documents selected for inclusion in QDS are cataloged in accordance with standard library practice. Accession numbers are assigned in numerical sequence. A listing is presented as Appendix A.

INDEXING

Indexing is performed in accordance with the procedure described in the following section. The assigned index terms are noted prior to document storage, and maintained in the retrieval request file with the accession numbers of the documents to which each term applies.

The thesaurus of keywords was developed through system use; i.e., each request made for information was screened to identify the terms and types of terms used by the requester. The thesaurus which was evolved has seven broad categories of terms; viz.,

- Medium or Format
- Originator
- Recipient
- Characteristics of content (purpose, status, etc.)
- Related flight projects and planets
- Associated places, organizations, etc.
- Subject Matter
Normally, at least one keyword is assigned from each category; often several are employed, especially in the last three categories cited.

The complete listing of terms currently employed is presented in Appendix B. No attempt has been made to develop an hierarchical arrangement for the subject matter category terms, which are listed in alphabetical order.

STORAGE

Documents are stored in three-ringed loose-leaf binders in a reserved area of the Exotech Systems offices on School Street, S.W. Arrangement is in numerical order by accession number. Withdrawals are carefully controlled; when extensive use is anticipated, copies are supplied.

RETRIEVAL

Document retrieval is effected through the catalog (by accession number, author or corporate author, title, subject) or by searching the keyword index terms. The choice depends upon the extent of identification available at the time of inquiry. Document requests are referred to the designated QDS retrieval operator, who records the request and conducts the search.

A significant aspect of the retrieval process is the interpretation of the request in a form commensurate with quick response to the requester. To
insure rapid and responsive retrieval we have assigned this task to a member of the Exotech Systems, Inc. professional staff who is knowledgable in the planetary quarantine program.
APPENDIX A

A Complete Listing of the Collection
United States space science program. Report to COSPAR. May 1968.
154 p., with 3 appendices. 11th Meeting, Tokyo, Japan.

I Author II Title III COSPAR meeting

Contents: U.S. organization and facilities; international activities; astronomy (stellar, solar, and planetary); particles and fields; upper atmospheric physics; earth sciences; life sciences; technological development; satellite and rocket launchings, 1967; planned launches for 1968; bibliography on space sciences, 1967.

Keywords: COSPAR; Space Science Board; Tokyo; Report; ETO

PQ-2

California Institute of Technology, Pasadena, California, Jet Propulsion Laboratory
10 Sections Project Document 138; 605-58

I Author II Title III Project Document IV NASA Contract no. NAS7-100

Contents: Trajectories; Aiming Point Selection Strategies; launch phase considerations; spacecraft maneuver analysis, considerations; orbit determination characteristics, introduction to; orbit determination accuracy, pre-maneuver; orbit determination accuracy, post-maneuver; orbit determination accuracy, encounter; orbit determination, special studies in.

Keywords: Mariner Mars 1969; Orbit; micrometeoroid dislodgement; efflux ejecta; JPL; Report; Maneuver
PQ-3

California Institute of Technology, Pasadena, California, Jet Propulsion Laboratory.

Preliminary flight path analysis orbit determination and maneuver strategy, Mariner Mars 1969
250 p. Project Document 138, Appendix; 605-58

I Author II Title III Project Document, Appendix IV NASA Contract no. NAS7-100

Keywords: Mariner Mars 1969; Orbit; micrometeoroid dislodgement; efflux ejecta; JPL; report; maneuver

PQ-4

California Institute of Technology, Pasadena, California, Jet Propulsion Laboratory.

9 Sections, with 3 appendices. Project Document 610-18, Part 1

I-III Authors IV Title V Project Document

Contents: Organization and Responsibilities; contamination analysis plan, probability of; documentation; data treatment; subcontractors; planetary quarantine requirements; facilities; services; schedules; technology advancements

Keywords: Mariner; Mars; Planetary Quarantine Plan; MM '71; JPL
California Institute of Technology, Pasadena, California, Jet Propulsion Laboratory.

2 Sections, with 1 appendix Project Document 610-18, Part III

**I-III Authors IV Title V Project Document**

Contents: Monitoring and Assay, Microbiological; microbial burden on spacecraft, estimation of;

Keywords: Mariner; Mars; Assay, plan; MM '71; JPL

---

Martin Marietta Corporation, Denver, Colorado.

2 p. Letter from W. C. Eberle, Concerning PQ Working Group Minutes

**I Author II Title III MDC Letter IV NASA Contract no. NAS1-9000**

Keywords: Meeting, Minutes; Viking;

Martin Marietta Corporation
Martin Marietta Corporation, Denver, Colorado.
3 p., 3 Enclosures Martin Marietta Corporation Planetary Quarantine Working Group Minutes of Meeting, March 18, 1970

I Author II Title III MNC-PQWG Minutes

Keywords: Planetary Quarantine Working Group, Meeting, Minutes; Viking, Martin Marietta Corporation

Jet Propulsion Laboratory, Pasadena, California.
Jet Propulsion Laboratory, Pasadena, California, Meeting of Planetary Quarantine Working Group, Dec. 10-11, 1970

I Author II Title III Jet Propulsion Laboratory-Planetary Quarantine Working Group, Meeting

Keywords: Martin Marietta Corporation; Planetary Quarantine Working Group; meeting; Viking; Action items
PQ-9


5 Sections, with 2 appendices General Electric Document No. VOY-C2-TR7

I-II Authors III Title IV Document No.

Contents: Heliocentric, transfer phase; aerocentric phase; further study, recommendations for

Keywords: GE; Mars; Micrometeoroid dislodgement; report; entry; solar wind; efflux ejecta

PQ-10

California Institute of Technology, *Pasadena, California, Jet Propulsion Laboratory.*


7 p., with 3 Tables and Appendix Project Document 610-18, Part III, (Preliminary)

I-II Authors IV Title V Project Document

Contents: Monitoring and Assay, Microbiological; microbial contamination occurring on spacecraft hardware, assessment of; intramural environment of space hardware assembly, test, and launch facilities, assessment of microbial and particulate contamination in the

Keywords: Mariner; Mars; assay plan; MM '71; JPL
National Aeronautics and Space Administration, Washington, D. C.
Viking '73 investigators.
5 p.
Dec. 18, 1969.

NASA News Release No: 69-166

Keywords: Viking; Mars; science; mission statement; NASA; news release
Implications of 1970 COSPAR recommendations on PQ requirements for Mars missions.

June 10, 1970.

Exotech Incorporated, Washington, D. C., Summary Report no. TRSK 70-42

Keywords: Exotech; N; Mars; P(N); Post-COSPAR; report; PQ requirements


5 p., with appendix


Keywords: Exotech; PQ constraints; Mars; Venus; P(N); N; Pre-COSPAR; report
Martin Marietta Corporation, Denver, Colorado, Denver Division.
Contract NAS1-9000, WBS 1.3, Planetary Quarantine Working Group (PQWG) agenda.
Nov. 4, 1970.
1 p. Martin Marietta Corporation, Denver Division, Memorandum, from A. A. Rothstein, Manager Planetary Quarantine, Viking Project, to Viking Project Office-NASA/Langley, Nov. 4, 1970

Keywords: Martin Marietta Corporation; Viking; Agenda; Planetary Quarantine Working Group; Meeting; Pasadena

NASA/Ames Research Center, Moffett Field, California.
Pioneer F/G planetary quarantine plan.
N.D.
13 p. NASA/Ames Research Center Document No. PC-204 (Draft)

Keywords: Ames; Pioneer F/G; Planetary Quarantine Plan; Jupiter
PQ-19

Roper, W. D.

I Author II Title III GWUBSCP Abstract.

Keywords: GWUBSCP; Spacecraft; Contamination; Thermal Vacuum; JPL

PQ-20

National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.

I Author II Title III NASA Handbook

Contents: Requirements, planetary quarantine constraints, decontamination, microbiology constraints; Documentation and Data Requirements, planetary quarantine specifications, pre-launch analysis, post-launch analysis; Management, project development plan review

Keywords: NASA; PQ Provisions; directive; report; policy
National Aeronautics and Space Administration, Washington, D. C.
Office of Space Science and Applications.
Planetary quarantine provisions for unmanned planetary missions (Rough Draft).
Nov., 1968.
20 p., with 1 appendix NASA Handbook NHB 8020.12 (Rough Draft)

I Author II Title III NASA Handbook

Contents: Requirements, planning, PQ constraints, decontamination, microbiology constraints; Documentation, data requirements; Management

Keywords: NASA; PQ Provisions; directive; report; policy

Fox, D.
Joint planetary quarantine program/Viking '73 operating agreement for implementation of planetary quarantine requirements. Dec. 8, 1969. Draft of VPO/PQO "Interface" Agreement, Received from D. Fox on January 19, 1970

I Author II Title III Draft

Keywords: Viking; Interface; Management; Agreement
Viking project: Planetary quarantine provisions, by L. P. Daspit, Jr.

I-11 Authors 111 Title IV NASA PQ Provisions

Contents: Applicability; Conflicting Requirements, deviations; Requirements, planning, planetary quarantine constraints, decontamination, microbiology constraints, launch operations constraints; Documentation and Data Requirements, planning documents, pre-launch analysis, post-launch analysis of planetary contamination

Keywords: Viking; Planetary Quarantine Provisions; Viking 75 Project; M75-127-1

Viking lander system and project integration. March 1, 1969.
22 p., with 6 Figures NASA/Langley Statement of Work

I Author II Title III NASA/Langley Statement of Work

Contents: Project Objectives, description; Government-furnished Data, equipment, facilities, and support; Contractor Tasks; NASA participation

Keywords: Viking; Integration; Langley Research Center; Report; Lander; RFP
Exotech Incorporated, Washington, D.C., Systems Research Division, TPSR 70-23

I Author II Title III Unsolicited Proposal

Contents: Proposed Work Statement; (quarantine document system for Viking, design and operation of); Viking, quarantine assurance evaluation studies for; Personnel and Organization

Keywords: Exotech, proposal, studies, support

Martin Marietta Corporation, Denver, Colorado.

I Author II Title III MMC Proposal

Keywords: Martin Marietta Corporation; Proposal; Viking
PQ-27

Martin Marietta Corporation, Denver, Colorado.

92 p. Martin Marietta Corporation, Denver Division, Coordination Draft no. PL-3701009

I Author II Title III NMC Draft

Contents: Applicable documents; Organization and responsibilities; Program controls; Planetary quarantine documentation; PQ analysis; Real time data management; Viking facilities, services; New technology; PQ schedules

Keywords: Viking; Planetary Quarantine Plan; Draft; Langley Research Center; Mars; MMC

PQ-29

National Aeronautics and Space Administration, Washington, D. C., Planetary Quarantine Office.


I Author II Title III NASA/Washington, Summary

Keywords: Planetary Quarantine Plan; Viking; Review; Comments; Memorandum; Exotech
PQ-30

National Aeronautics and Space Administration, Washington, D. C., Planetary Quarantine Office.


NASA/Washington, Planetary Quarantine Office Summary of Coordination Draft of PQ Plan (PL-3701009), Jan. 27, 1970

I Author II Title III NASA/Washington, Summary

Keywords: PQ Plan; Viking; Review; Comments; Memorandum; revision; NASA

PQ-31

National Aeronautics and Space Administration, Washington, D. C.

Viking planetary quarantine plan.

NASA Memorandum, from SB/Dr. Donald G. Fox.

I Author II Title III NASA Memorandum

Keywords: Memo; Viking; Planetary Quarantine Plan; Review; PQO; comments
PQ-32


I-II Authors III Title IV Jn. cit.

Keywords: Report; Fox; Sterilization; Viking; thermal radiation; diffusion

PQ-33

NASA/Langley Research Center, Hampton, Virginia, Langley Station.
NASA/Langley Research Center Memorandum from Viking Project Manager to NASA, Code SL, Attn: Mr. W. Jakobowski

I Author II Title III NASA/Langley Memorandum

Keywords: Viking; Requirements; Planetary Quarantine provisions; memo; LRC
Neill, Arthur H.

Keywords: COSPAR; post-launch; analysis; MM '69; NASA; draft; report

Martin, James S.

Keywords: Memorandum; Viking; Planetary Quarantine Plan; Comments; Deviations; LRC; Martin
PQ-36

California Institute of Technology, Pasadena, California, Jet Propulsion Laboratory.


I Author II Title III Jet Propulsion Lab. Letter

Keywords: JPL; NHB 8020.12; MM '71; Mars; budget; letter; assay

PQ-37

National Aeronautics and Space Administration, Washington, D. C.

Clarification of NHB 8020.12, paragraph 2.2.4.3.1. Oct. 1, 1970. 1 p. NASA Memorandum, from SL/Manager, Mariner Mars '71, Planetary Programs to SB/Planetary Quarantine Officer, Bioscience Programs

I Author II Title III NASA Memorandum

Keywords: Memorandum; NHB 8020.12; MM '71; assay; NASA; approval
PQ-38

National Aeronautics and Space Administration, Washington, D. C.

Mariner Mars 1971 planetary quarantine plan - PD 610-18, dated
11 February 1970.

2 p. NASA Memorandum, from SB/Planetary Quarantine Officer,
Bioscience Programs, to SL/Program Manager, Mariner Mars '71 Mis-
sion, Planetary Programs

I Author II Title III NASA Memorandum

Keywords: Memorandum; Approval; Mars; Planetary Quarantine
Plan; comments; PQO; MM '71

PQ-39

California Institute of Technology, Pasadena, California, Jet Propulsion
Laboratory.

Response to SB/Deputy Planetary Quarantine Officer's comments on prelimi-

Memorandum on Assay & Monitoring Plan, from A. R. Hoffman/M. R. Christensen,
to N. R. Haynes

I Author II Title III Jet Propulsion Lab. Memorandum

Keywords: JPL; MM '71; Mars; assay; plan; comments;
esticiency factor; Memorandum
PQ-40

National Aeronautics and Space Administration, Washington, D. C.  
Reallocation of $P_c$ to Viking 1975.  
1 p.  NASA Memorandum from Lawrence B. Hall, Planetary Quarantine Officer, to SL/Walter Jakobowski, Viking Program Manager

I Author II Title III NASA Memorandum

Keywords: Viking; Mars; Memorandum; N; P(N); PQO; allocation

---

PQ-41

National Aeronautics and Space Administration, Washington, D. C.  
Reallocation of $P_c$ to Mariner 1971.  
1 p.  NASA Memorandum from SB/Lawrence B. Hall Planetary Quarantine Officer to SL/Earl Glahn, Mariner '71 Program Manager

I Author II Title III NASA Memorandum

Keywords: Mariner '71; Mars; Memorandum; N; P(N); allocation; PQO; approval
PQ-42

National Aeronautics and Space Administration, Washington, D. C.
Revision of the value of $P_c$ for Mars. Aug. 12, 1970. 1 p. NASA Memorandum from SB/Lawrence B. Hall, Planetary Quarantine Officer to SL/Walter Jakobowski, Viking Program Manager

I Author II Title III NASA Memorandum

Keywords: $P_c$; Mars; Memorandum; Woods Hole; SSB; Viking; PQO; review; value; confidence; approval

PQ-43

Exotech Systems, Inc., Washington, D. C.

I Author II Title III Exotech Systems, Inc., Memorandum

Keywords: Viking, meeting; LaRC; MMC; Planetary Quarantine Requirements; Math Model; Sterilization; repairs
Neill, Arthur H.

Comments on preliminary microbiological assay and monitoring plan.
May 27, 1970.

2 p. Memorandum, from Arthur H. Neill, SB/Deputy Planetary Quarantine Officer, to SL/Program Manager, Mariner Mars '71, May 27, 1970

I Author II Title III Memorandum

Keywords: MM '71; Memorandum; Comments; Microbiological Assay and Monitoring Plan; estimation; # samples; Neill; PQO

---

National Aeronautics and Space Administration, Washington, D. C.,
Office of Space Science and Applications.

Biological sampling for Viking '73

1 p. NASA/ Washington Memorandum from SB/Planetary Quarantine Officer to LaRC/Viking Project Manager

I Author II Title III NASA Memorandum

Keywords: Viking; microbiological assay; memorandum; sampling; # samples; agreement; PQO
PQ-46

Dr., Fox, Donald G.
1 p. Minutes of Bi-weekly Meeting, from Dr. Donald G. Fox to Memorandum For The Record, Jan. 6, 1970

Author II Title III Minutes

Keywords: Viking; Meeting; Bi-weekly; Minutes; Fox; interface; correspondence

PQ-47

Viking project plan.
1 p. NASA/Washington Memorandum, from SB/Lawrence B. Hall - Planetary Quarantine Officer to SL/Walter Jakobowski - Viking Program Manager

Author II Title III NASA Memorandum

Keywords: Viking; Planetary Quarantine Provisions; Comments; P(N); Memorandum; review; approval; PqO
PQAC recommendation XV: \( D\)-values.  
3 p.  
PQAC Summary Report, February, 1969

I Title II PQAC Report

Keywords: \( D\)-values; PQAC; summary report; \( P_g \); Sneath; error; action; \( N\), recommendations; conservation; ETO; \( P(vt) \)

PQ-49

National Aeronautics and Space Administration, Washington, D.C., Office of Space Science and Applications.
Allocation of \( P \) to Pioneer F.  
Aug. 12, 1970.
1 p.  
NASA/ Washington Letter, from SB/Lawrence B. Hall, to SL/Gleen Reiff, Pioneer Program Manager

I Author II Title III NASA Letter

Keywords: Pioneer; \( P(N) \); T; \( N\); Requirement; Jupiter; Memorandum; PQO; \( P(g) \); parameter; values; approval
PQ-50

Martin Marietta Corporation, Denver, Colorado, Denver Division.
Contract NAS1-9000 - Classification of questionable burden areas on the Viking lander.

I Author II Title III MMC Letter

Keywords: Bioburden; MMC; letter; Mated; surface; definitions; VPO; FA cycle; parachute

PQ-51

California Institute of Technology, Pasadena, California, Jet Propulsion Laboratory.
August 20, 1970.

I Author II Letter

Keywords: Mercury; Venus; MVM '73; Letter; JPL; Planetary Quarantine Plan; Planetary Quarantine Requirements; relaxation; funds
PQ-52

Strobel, G. K.

I Author II Title III Memorandum

Keywords: MVM '73; Planetary Quarantine Plan; Planetary Quarantine requirements; Mercury; Venus; Memorandum; SL; request; relaxation

PQ-53


I Author II Title III NASA Memorandum

Keywords: Memorandum; Mariner; Venus; Mercury; Planetary Quarantine Plan; guidelines; P(N); P; PQO; MVM '73
PQ-54

National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.
3 p. NASA/Washington, D. C., Letter from Lawrence B. Hall to Dr. Wolf Vishniac, pertaining to Dr. Sneath's "Memorandum on Estimating Probability Parameters", presented to the 1970 COSPAR Panel on Planetary Quarantine

I Author II NASA Letter

Keywords: Letter; Vishniac; Sneath; Conservatism; $P_g$; error; Hall

PQ-55

The University of Rochester, Rochester, New York, Department of Biology.
August 17, 1970.
1 p. The University of Rochester, Rochester, N. Y., Dept. of Biology Letter, from Wolf Vishniac to Lawrence Hall pertaining to the definition of planetary contamination

I Author II Letter

Keywords: $P_e$; definition; letter; Vishniac; Antarctic

2 p. NASA/Washington, D. C., Office of Space Science and Applications Letter, from Lawrence B. Hall to Dr. Charles R. Phillips

I Author II NASA Letter

Keywords: Venus; P_g; letter; Hall; request; comments; experiments; clouds; aerosols


Aug. 12, 1970.

2 p. NASA/Washington, D. C., Memorandum, from SB/Lawrence B. Hall to SL/Glen Reiff, Aug. 12, 1970

I Author II Title III NASA Memorandum

Keywords: Pioneer; Jupiter; Memorandum; Planetary Quarantine Plan; Comments; requirements; Hall
Letter from Lawrence B. Hall to Dr. Carl Sagan, July 31, 1970

Keywords: Letter; Sagan; jupiter; pioneer; Hall; outer planets; requirements
PO-60

National Aeronautics and Space Administration, Washington, D. C.,
Office of Space Science and Applications,
June 23, 1970.
1 p. NASA/Washington, D. C., Office of Space Science and Applications
Letter, from Lawrence B. Hall to Dean P. Kastel, June 23, 1970

I Author II NASA Letter

Keywords: SSB; Letter; N; P(N); Hall; outer planets; Jovian

PQ-61

National Aeronautics and Space Administration, Washington, D. C.,
Office of Space Science and Applications,
April 10, 1970.
2 p. NASA/Washington, D. C., Office of Space Science and
Applications, Letter from Lawrence B. Hall to Dean P. Kastel, April
10, 1970.

I Author II NASA Letter

Keywords: SSB; Palo Alto; N; P(N); letter; Hall; allocation
PQ-62

National Aeronautics and Space Administration, Washington, D. C.,
Office of Space Science and Applications.
2 p. NASA/Washington, D. C., Office of Space Science and Applications
Memorandum, from Lawrence B. Hall to SL/Director

I Author II Title III NASA Memorandum

Keywords: Memorandum; requirements; relaxation; Mars; buried; PQO;
stereilization

PQ-63

National Aeronautics and Space Administration, Washington, D. C.,
Office of Space Science and Applications.
1 p. NASA/Washington, D. C., Office of Space Science and Applications,
Memorandum, from Orr E. Reynolds, to Director/SL, July 22, 1969

I Author II Title III NASA Memorandum

Keywords: Mariner '71; Mars; Project Plan; Memorandum; approval; PQO
National Aeronautics and Space Administration, Washington, D. C.,
Office of Space Science and Applications.
Meeting of the Space Science Board Annual ad hoc review committee for
1 p. NASA/Washington, D. C., Office of Space Science and Applications, Memorandum from L. B. Hall to SL/Director, Planetary Programs

Keywords: SSB; Palo Alto; Memorandum; agenda; meeting; PQQ

Exotech Systems, Inc., Washington, D. C.

Keywords: Viking; Langley Research Center; Planetary Quarantine Requirements; Model; Sterile repair; MMC; Bioburden model; Sterilization model; memo; Bacon; meeting; minutes
PQ-66

Stanford University School of Medicine, Stanford, California, Stanford University Medical Center, Dept. of Community and Preventive Medicine. Comments on Sneath's memorandum on estimating probability parameters by Byron Wm. Brown, Jr. August 20, 1970. 3 p. with Enclosure Stanford University School of Medicine, Stanford, California, Stanford University Medical Center, Dept. of Community and Preventive Medicine, Comments on Sneath's Memorandum, by Byron Wm. Brown, Jr., Aug. 18, 1970

I-II Authors III Title IV Comments

Keywords: Brown; Sneath; Bayesian statistics; parameter estimation; COSPAR; evaluation; comments; safety factors; confidence

PQ-67


I Author II Letter (USAMRDC)

Keywords: USAMRDC; Briefing; AD Little; Hospital; Sterilization; Aug. 11, 1970; Letter; appreciation
Denver Division.


Minutes of planetary quarantine working group meeting, Viking project, contract NASL-9000.

Keywords: Martin Marietta Corporation; Planetary Quarantine Working Group; Viking; Meeting; Minutes; assay

Sandia Laboratories, Albuquerque, New Mexico.


Communication Project Abstract on Sandia Laboratories Research Report # SC-RR-70-301, May 1970

Keywords: abstract; radiation; sterilization; Sandia, report
PQ-70

Exotech Systems, Inc., Washington, D.C.

I Author II Title III Exotech Systems, Inc. Report IV NASA Contract no. NASw-2052

Keywords: Report; Exotech; P; SSB; Woods Hole; Mars; implications

PQ-71

Exotech Systems, Inc., Washington, D.C.

I Author II Title III Exotech Systems, Inc., Memorandum

Keywords: Pioneer; P; P(N); Quarantine Period; Jupiter; Bacon; memo; requirements
PQ-72

National Aeronautics and Space Administration, Washington, D.C.
1 p. NASA Letter from Lawrence B. Hall, Planetary Quarantine Officer to Dr. Wolf Vishniac, University of Rochester, Dept. of Biology, July 28, 1970

I Author II NASA Letter

Keywords: SSB; P; Definition of terms; Vishniac; Woods Hole; COSPAR; letter; Hall

PQ-73

Martin Marietta Corporation, Denver, Colorado, Denver Division.

I-II Authors III Title IV MMC Report V NASA Contract no. NASI-9000

Contents: Bio Burden Model; Burden Estimation from Assays - The Sampling Model, description of, verification of; Burden Prediction - The Prediction Model; Sampling Strategy; Applicable Documents

Keywords: Viking; Bio Burden; model; estimation; prediction; Martin Marietta; Control Div. ; report; Nelson
PQ-75

Jet Propulsion Laboratory, Pasadena, California.
Minutes of planetary quarantine meeting at JPL on 6-7 May 1970, by
A. A. Rothstein and Richard H. Green. N.D.
5

I-III Authors IV Title V Minutes (JPL)

Keywords: Viking; Planetary Quarantine Working Group; Meeting;
Minutes; allocation

PQ-76

Jet Propulsion Laboratory, Pasadena, California.
Planetary Quarantine Working Group meeting of July 16-17, 1970,
by A. A. Rothstein, R. H. Green, and L. P. Daspit, Jr. N.D.

I-IV Authors V Title VI Minutes (JPL)

Keywords: PQWG; Meeting; Minutes; Models; Viking
PQ-77


Martin Marietta Corporation, Denver Division Letter from A. A. Rothstein, Manager Planetary Quarantine to NASA Headquarters, Planetary Quarantine Office (Mr. L. B. Hall)

I Author II Title III AMC Letter

Keywords: Martin Marietta Corporation; Planetary Quarantine Working Group; Meeting; Agneda; Viking; minutes

PQ-78


American Institute of Biological Sciences, Washington, D. C., Memorandum from Mary Frances Thompson-Coordinator, Special Science Projects to Viking Consultants, Dec. 5, 1969

I Author II Title III AIBS Memorandum

Keywords: AIBS; Planetary Quarantine Plan; Review Schedule; (Viking) memo
PQ-79

Exotech Systems, Inc., Washington, D. C.
July 22, 1970.

Lester D. Shubin, Senior Scientist, concerning Re: NASw-2062,
July 22, 1970

I Author II Title III Exotech Systems, Inc., Letter

Keywords: Organic Inventory; Principal Investigators; Letter;
Questionnaire; Shubin; request

---

PQ-80

COSPAR, Panel on Planetary Quarantine.
COSPAR abstracts at Seattle meeting. March 5, 1971.
COSPAR, Panel on Planetary Quarantine, Abstracts at Seattle Meeting,
March 5, 1971

I Author II Title III COSPAR Abstracts

Keywords: COSPAR; Memorandum; Seattle; Paper; Approval; presentation; Neill
Mitchell, R. T.
Errata to preliminary flight path analysis orbit determination and maneuver strategy Mariner Mars 1969. May 7, 1968.

I Author II Title III Paper

Keywords: Mariner Mars '69; Mars; Jet Propulsion Lab.; orbit; memo; revision; analysis

PQ-82

1. NAS-NRC, Washington, D. C., Space Science Board, Memorandum, (Concerning Review of Sterilization Parameter Probability of Growth (P_g), from D. P. Kastel, Secretary to Participants, Sterilization Parameter Review: Probability of Growth (P_g), Sept. 17, 1970

I Author II Title III NAS-NRC, Space Science Board, Memorandum

Keywords: Space Science Board; Meeting; Woods Hole; P_g; Conservatism minutes; Kastel; draft
PQ-83


1 p. NASA/Washington Viking Project Document Memorandum, from SB/Director to SL/Director, March 5, 1969

I Author II Title III Memorandum (NASA/Washington)

Keywords: Planetary Quarantine provisions; (Viking); Flight Project Document; Approval; memo; Reynolds

PQ-84


1 p. with 2 Enclosures Martin Marietta Corporation, Denver Division Minutes, March 5, 1970

I Author II Title III MMC Minutes

Keywords: Viking; MMC; meeting; PQWG; minutes
PQ-85

Exotech Systems, Inc., Washington, D.C.
July 24, 1970.

I Author II Title III EXI Memorandum

Keywords: Viking; Sterilization Plan; Review; Comments; Memorandum;
Overkill; Exotech

IQ-86

NASA/Ames Research Center, Moffett Field, California.
10 p. with Figures NASA/Ames Pioneer F/G Program Document # PC-204

I Author II Title III NASA/Ames Document #

Keywords: Pioneer; Planetary Quarantine Plan; Jupiter; report; analysis;
Ames; model
FQ-87

Exotech Systems, Inc., Washington, D. C.

I Author II Title III ESI Memorandum

Keywords: P(N); N; Mars; COSPAR; Viking; memo; Bacon; allocation; non-landers; landers

FQ-88

National Aeronautics and Space Administration, Washington, D. C.
Trajectory acceptance and planetary quarantine certification - Mariner 1969 Mars mission. N.D.
1 p. NASA/Washington Memorandum from Orr E. Reynolds, SB/Director of Bioscience Programs to S/Associate Administrator for Space Science and Applications

I Author II Title III NASA/Washington Memorandum

Keywords: Mariner '69; Mars; Memorandum; pre-launch analysis; approval; Reynolds; certification
FQ-89

National Aeronautics and Space Administration, Washington, D. C.
Planetary quarantine certification of Mariner 1969 mission. N.D.
1 p. NASA/Washington Memorandum from John E. Naugle, S/Associate
Administrator for Space Science and Applications to A/Administrator

I Author II Title III NASA/Washington Memorandum

Keywords: Memorandum; Mariner '69; Mars; Naugle

FQ-90

Horowitz, N. H.
Planetary contamination I: The problem and the agreements, by

I-III Authors IV Title V Jn. Cit.

Keywords: publication; analysis; ZOND; Venus; Mars; bus deflection
Horowitz; science; report; relaxation; history
Reynolds, M. C.

Pflug, I. J.

Keywords: thermal radiation; GWUBSCP; abstract; Sandia; radiation; sterilization

Keywords: GWUBSCP; abstract; Minnesota; sterilization; D-value; Pflug; surface; mated; buried
PQ-95

Martin Marietta Corporation, Denver, Colorado.

Keywords: GWUBSCP; abstract; bioburden; prediction; model; JPL; MMC

PQ-96

U. S. Dept. of The Army, Frederick, Maryland, Fort Detrick.

Keywords: GWUBSCP; abstract; ETO; sterilization; Detrick; Phillips; tests
PQ-97


I-V Authors VI Title VII GWUBSCP Abstract

Keywords: GWUBSCP; abstract; General Electric; aseptic; maintenance; pressurization

PQ-98

Jet Propulsion Laboratory, Pasadena, California.

I-II Authors III Title IV GWUBSCP Abstract

Keywords: JPL; Mars; entry; GWUBSCP; abstract; Jet Propulsion Laboratory; facility; atmosphere; simulation
PQ-99

Puleo, J. R.

I-IV Authors V Title VI GWUBSCP Abstract = burden
Keywords: Puleo; detection; GWUBSCP; bioburden; Apollo; Abstract

PQ-100

Sandia Laboratories, Albuquerque, New Mexico.

I-IV Authors V Title VI GWUBSCP Abstract
Keywords: GWUBSCP; thermoradiation; sterilization; Sandia; abstract
COSPAR, Panel on Planetary Quarantine.
Potentially harmful effects of space experiments on planetary quarantine. 1969.
COSPAR, Panel on Planetary Quarantine, Report to the Consultative Group, Prague, May 17, 1969

I Author II Title III COSPAR, PQ Panel Report

Keywords: COSPAR; Planetary Quarantine Panel; N; Prague; Planetary Quarantine Requirements; SSB; meeting; minutes; T; deflection

COSPAR, Panel on Planetary Quarantine.
Interim Report of the Panel on planetary quarantine (Item 12), by Dr. Hedén.
COSPAR, Interim Report of the Panel on Planetary Quarantine

I Author II Title III COSPAR Report

Keywords: COSPAR; Contamination log; Leningrad; Jovian; PQ Panel; P(g); meeting; minutes
Clarification of NHB 8020.12, paragraph 2.2.4.3.1. Sept. 2, 1970.
2 p. NASA/Washington, Memorandum from SB/Planetary Quarantine Officer Lawrence B. Hall to SL/Program Manager, Mariner Mars 1971, Sept. 2, 1970

I Author
II Title
III NASA/Washington Memorandum

Keywords: NHB 8020.12; Memorandum; verification; MM '71; assay; sampling; PQO; clarification; order; scope; PHS


I Author
II Title
III NASA/Washington Letter-Report

Keywords: SSB; MM '64; pre-launch analysis; impact; Mars; Newell
FQ-105


I Author II Title III NASA/Washington Letter

Keywords: SSB; MM '69; Mars; post-launch analysis report; letter; transmittal

FQ-106

California Institute of Technology, Pasadena, California, Jet Propulsion Laboratory.
23 p. Jet Propulsion Laboratory, Pasadena, California, JPL Project Document 123

I-II Authors III Title IV JPL Document

Contents: Mathematical Model; Contaminating Venus, probability of; Mission profile; accidental vehicle impact, probability of; spacecraft ejecta contaminating Venus, probability of

Keywords: MV '67; prelaunch analysis; Jet Propulsion Laboratory; report
National Aeronautics and Space Administration, Washington, D. C.,
Office of Space Science and Applications.
5 p. NASA/Washington Memorandum, from Orr E. Reynolds, Director, Bioscience Programs, Office of Space Science and Applications to Mr. George Derbyshire, Secretary-Space Science Board of the National Academy of Sciences, Washington, D. C., Jan., 1969

Keywords: D values; letter; status; SSB; P_c; P_g; letter; Reynolds; Derbyshire

National Aeronautics and Space Administration, Washington, D. C.,
Further reduction of sterilization requirements.
2 p. NASA/Washington Memorandum from Lawrence B. Hall, Lunar and Planetary Quarantine Officer, Bioscience Programs, Office of Space Science and Applications to SL/Director, Jan., 1969

Keywords: Memorandum; SB; P_r; relaxation; Mars; environment; parameter value
PQ-109

National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.


1 p. NASA/Washington Memorandum from Orr E. Reynolds, SB Director, Bioscience Programs, Office of Space Science and Applications to SL/ Director, Jan., 1969

I Author II Title III NASA/Washington Memorandum

Keywords: P(N); Mars; MM '71; Memorandum; SB; N; Viking; allocation; T; Reynolds; official

---

PQ-110

National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications, Bioscience Programs.


1 p. NASA/Washington Memorandum, from SB/Donald C. Fox, Sterility Control Officer to SB/Lawrence B. Hall, Feb., 1969

I Author II Title III NASA/Washington Memorandum

Keywords: Viking; Memorandum; SB; Schedule; contractor; procurement; Fox
PQ-111


I Author II Title III NASA/Washington Memorandum

Keywords: Sampling; Viking; Memorandum; SB; assay; agreement; LaRC

PQ-112


I Author II Title III NASA/Washington Memorandum

Keywords: SB; Memorandum; Viking; Planetary Quarantine Provisions; Approval; Reynolds
PQ-113

National Aeronautics and Space Administration, Washington, D. C.,
Office of Space Science and Applications.
1 p. NASA/Washington Memorandum, from Lawrence B. Hall SB/Planetary Quarantine Officer to SL/Viking Program Manager, April, 1969

I Author II Title III NASA/Washington Memorandum

Keywords: Memorandum; SB; Viking; MAST; sterile insertion; PQO; problem

PQ-114

National Aeronautics and Space Administration, Washington, D. C.,
Office of Space Science and Applications.
1 p. NASA/Washington Memorandum, from SB/Director, Orr E. Reynolds to SL/Director, June, 1969

I Author II Title III NASA/Washington Memorandum

Keywords: Memorandum; SB; Project plans; approval; sign off; procedure; Reynolds
PQ-115

National Aeronautics and Space Administration, Washington, D. C.
1 p. NASA/Washington Memorandum from Donald P. Hearth-SL/Director, Planetary Programs, to SB/Director, Bioscience Programs, July, 1969.

I Author II Title III NASA/Washington Memorandum

Keywords: Memorandum; SL; Project Plans; Submittal; procedure; sign off

PQ-116

National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.

I Author II Title III NASA/Washington Memorandum

Keywords: Viking; Memorandum; SB; Meeting; Schedule; coordination; agreement
PQ-117

1 p. NASA/Washington Letter, from Lawrence B. Hall, Planetary Quarantine Officer to Dr. W. H. Pickering, Director Jet Propulsion Lab., Pasadena, Calif., July, 1969

I Author II NASA/Washington, Letter

Keywords: Letter; SB; JPL; support; resident; request

PQ-118


I Author II Title III NASA/Washington Memorandum

Keywords: Memorandum; SL; Viking; documents; meeting; LaRC; coordination; agreement; procedures
National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.

July 17, 1969.


I Author II NASA/Washington Letter

Keywords: Letter; American Institute of Biological Sciences (AIBS); Viking; Support; Viking Quarantine Evaluation Board (VQEB); request; funds; support; Hall

---

National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.

July 22, 1969.

1 p. NASA/Washington Letter from Donald G. Fox, Sterility Control Officer to Dr. Martin S. Favero, USPHS-NCDC, Phoenix Labs., Phoenix, Arizona, July 22, 1969

I Author II NASA/Washington Letter

Keywords: Letter; Favero; Viking; assay plan; scope; arrangements; Fox

NASA/Washington Memorandum from Planetary Quarantine Officer/SB Lawrence B. Hall to Director/SL, July 28, 1969

Keywords: Memorandum; P_c; P_g; SB; P(N); Mars; Venus; Jupiter; parameter values; SSB; official; approved


NASA/Washington Memorandum from Walter Jakobowski SL/Viking Program Manager, Planetary Programs to SPI/John W. Rosenberry, July 28, 1969

Keywords: Memorandum; SL; Viking; Sterilization; Facility; MAST; utilization; rejection

Keywords: Letter; Viking; Langley Research Center; MAST; utilization; facility; sterile insertion; rejection


Keywords: Memorandum; Phoenix; Assay; Viking; workload; schedule; JPL; assignment; scope
PQ-125


I Author II Title III NASA/Washington Memorandum

Keywords: Memorandum; SB; Viking; Sterilization; Facility; MAST; sterile insertion; requirement; clarification

PQ-126


I Author II NASA/Washington, Memorandum

Keywords: Memorandum; SB; Viking; Sterilization; facility; MAST; clarification; procedures; agreement; sterile insertion
PQ-127

2 p. NASA/Washington Letter from Donald G. Fox, Ph. D., Planetary Quarantine Program Officer to Mr. Sam Schalkowsky, Exotech, Inc., Washington, D. C., Nov., 1969

I Author II NASA/Washington Letter

Keywords: Letter; Fox; Viking; meeting; bioburden; model; agenda; assay; sampling; procedure

PQ-128


I Author II Title III NASA/Washington Preliminary Agenda

Keywords: Agenda; Viking; bioburden; meeting; model; assay; sampling; statistics
Jet Propulsion Laboratory, Pasadena, California.
August 8, 1969.

Keywords: letter; Jet Propulsion Laboratory; resident; support; Pickering; agreement

Exotech Inc., Washington, D. C.
Comments on draft of Mariner Mars '71 PQ plan PD 610-18. March 6, 1970.

Keywords: Memorandum; Exotech; MM '71; PQ plan; comments; review
Exotech Inc., Washington, D. C.
Additional comments on draft of Mariner Mars '71 PQ plan PD 610-18.
March 12, 1970.

Keywords: Memorandum; Exotech; MM '71; PQ Plan; comments; review; burden; arrival

Sandia Laboratories, Albuquerque, New Mexico.

Keywords: Viking; Sandia; Letter; assay; fracture; sensitivity; adsorption; vacuum probe
PQ-133

Exotech Incorporated, Washington, D. C.
Visit with Al Hoffman of JPL. March 10, 1970.
1 p. Exotech Incorporated, Washington, D. C., Interoffice
Memorandum, from E. Bacon to SS, LS, PL, dated March 10, 1970

I Author II Title III Exotech Inc., Memorandum

Keywords: Memorandum; Exotech; MM '71; Pre-launch analysis;
Hoffman; Meeting; micrometeoroid dislodgement

PQ-134

National Aeronautics and Space Administration, Washington, D. C.,
Planetary Quarantine Office.
Planetary quarantine office program objectives. N.D.
NASA/Washington, Planetary Quarantine Office Program Objectives

I Author II Title III NASA/Washington Program Objectives

Keywords: Atlanta; PQAC; Program Objectives
PQ-135

National Aeronautics and Space Administration, Washington, D. C.
Headquarters funded projects.
N.D.

I Author II Title III NASA Headquarters Funded Projects

Keywords: Atlanta; PQAC; Program Objectives; evaluation; review; tasks; contracts

PQ-136


TASK: To participate in Viking design reviews. 1969.
2 p. NASA/Washington Task Description and Planning Sheet,
Referenced from NHB 8020.12 3.2(5), 1969

I Author II Title III NASA/Washington Task Description and Planning Sheet

Keywords: Viking, Task; Task descriptions; planning; Exotech; design review

TASK: Perform surveillance microbiological assays of facilities and hardware.

NASA/Washington Task Description and Planning Sheet, Referenced from NHB 8020.12 Par 3.2(8)(1)

I Author II Title III NASA/Washington Task Description and Planning Sheet

Keywords: Viking; Task; Task descriptions; planning; assay; Exotech

Kereluk, K.

Microbiological aspects of ethylene oxide sterilization, by K. Kereluk, R. A. Gammon and R. S. Lloyd.


I-III Authors IV Title V GWUBSCP Abstract

Keywords: abstract; George Washington University-Biological Sciences Communication Project = GWBSCP; ETO; sterilization
PQ-139

Kereluk, K.

I-III Authors IV Title V GWUBSCP Abstract

Keywords: abstract; George Washington University-Biological Sciences Communication Project; Ethylene Oxide = ETO

PQ-140

Kereluk, K.

I-III Authors IV Title V GWUBSCP Abstract

Keywords: abstract; George Washington University-Biological Sciences Communication Project; Ethylene Oxide; water activity; humidity; D value
Kereluk, K.

Keywords: GWUBSCP; abstract; ethylene oxide; sterilization; humidity; lethality; water activity

Rueter, A.

Keywords: abstract; GWUBSCP; sterilization; ethylene oxide; toxicity; compatibility; lethality
PQ-143

Petersen, N. J.

I-II Authors III Title IV GWUBSCP Abstract

Keywords: George Washington University-Biological Sciences Communication Project = GWUBSCP; abstract; sampling; vacuum probe; surface; Minnesota

PQ-144

Whitfield, W. J.
The vacuum probe sampler, by W. J. Whitfield and M. E. Morris. March 5, 1970.

I-II Authors III Title IV GWUBSCP Abstract

Keywords: George Washington University-Biological Sciences Communication Project; (GWUBSCP); abstract; Sandia; vacuum probe; sampling; surface
Anon

I Title II GWUBSCP Abstract
Keywords: GWUBSCP; abstract; Sandia; sterilization; radiation; thermoradiation; synergism

U. S. Dept. of The Army, Frederick, Maryland, Headquarters, Fort Detrick.
Quarterly status report from 1 November 1969 to 1 February 1970 on NASA Contract R-35.
1 p. George Washington University-Biological Sciences Communication Project, Department of Medical and Public Affairs, Abstract

I Author II Title III GWUBSCP Abstract
Keywords: GWUBSCP; abstract; Detrick; sterilization; chemicals; progress report

I Author II Title III GWUBSCP Abstract

Keywords: GWUBSCP; Abstract; contamination; control; handbook; NASA; Marshall; Sandia


I Author II Title III NASA/Langley Memorandum

Keywords: Memorandum; Viking; T; clarification; agreement; Martin (J.S.)
NASA/Washington Memorandum from SB/Planetary Quarantine Officer, Lawrence B. Hall to SL/Viking Program Manager, Nov., 1969

Author

Title

NASA/Washington Memorandum

Keywords: Viking; Memorandum; SB; T; N; clarification

Cornell University, Ithaca, New York, Center for Radiophysics and Space Research, Space Science Building, August 18, 1970.


Author

Cornell University, Letter

Keywords: Letter; Sagan; Jovian; Planetary Quarantine Requirements; Entry heating; Radiation; RTG
National Aeronautics and Space Administration, Washington, D. C.


1 p. NASA/Washington Memorandum, from SL/Manager of Viking Program, Walter Jakobowski to SL/Director of Planetary Programs, Donald P. Hearth, April 9, 1969

I Author II Title III NASA/Washington Memorandum

Keywords: Memorandum; SL; Viking; Planetary Quarantine Provisions; review; comments

The George Washington University Medical Center, Washington, D. C.

Biological Sciences Communication Project.

May 17, 1971.

2 p. Biological Sciences Communication Project, Letter, from Frank D. Bradley, Senior Staff Scientist, to Dr. Vishwanath More, Asst. Professor in Political Science and Law, Johnston College, University of Redlands, May 17, 1971

I Author II Series note

Keywords: George Washington University; Letter; More; International Law; Back Contamination
National Aeronautics and Space Administration, Washington, D. C.
1 p. NASA/Washington Memorandum from SL/Viking Program Manager, Planetary Programs-Walter Jakobowski to SB/Planetary Quarantine Officer-Bioscience Programs, March 1970

Author II Title III NASA/Washington Memorandum

Keywords: Memorandum; SL; Viking; PQ plan; submittal; deviations

National Aeronautics and Space Administration, Washington, D. C.
1 p. NASA/Washington Memorandum from SD/Planetary Quarantine Officer, Lawrence B. Hall to SL/Viking Program Manager, September, 1969

Author II Title III NASA/Washington Memorandum

Keywords: Viking; memorandum; Project plan; review; comments; PQO; clean room; assay; amendment
PQ-155

Exotech Incorporated, Washington, D. C.
Notes on thermal radiation sterilization meeting. April 23, 1970.

I Author II Title III Exotech Memorandum

Keywords: memorandum; Exotech; meeting; Sandia; Sterilization; radiation; thermoradiation; status; report; minutes

PQ-156

IN Industrial Research: 41, May, 1970

I Title II Jn. Cit.

Keywords: Viking; Mars; Science; MSGC; news release; publication; characteristics

Keywords: Exotech; Report; P(r); Mars; COSPAR; Leningrad; Schalkowsky; Levy


Keywords: Report; Review; bioburden; model; estimation; prediction; JPL; Angelotti
Exotech Systems, Inc., Washington, D. C.

I Author II Title III ESI Memorandum

Keywords: Mercury; Venus; Comments; Memorandum; PQ plan; MM '73; Requirements; waiver; review; Exotech

Murray, Bruce C.
Planetary contamination II: Soviet and U. S. practices and policies, (Quarantine can be neither absolute nor unilateral; U.S. policy should acknowledge Soviet practice), by Bruce C. Murray, Merton E. Davies, and Phillip K. Eckman.

I-III Authors IV Title V Jn. Cit.

Keywords: Davies; Status; USSR; P(N); Mars; Venus; history; publication
PQ-161

Sneath, P. H. A., editor.  
Sterilization techniques for instruments and materials as applied to space research.  
(Issued) Nov., 1968.  

I Editor II Title III COSPAR Technique Manual Series

Keywords: COSPAR; sterilization; techniques; probability nomenclature

PQ-162

National Aeronautics and Space Administration, Washington, D. C.  
Interface of the P.Q. program with the Viking 173 program, project and contractors.  
Oct. 9, 1969.  
2 p.  NASA/Washington Memorandum, from Planetary Quarantine Officer Lawrence B. Hall to Planetary Quarantine Staff and Supporting Personnel

I Author II Title III NASA/Washington Memorandum

Keywords: Viking; memorandum; interface; agreements
PQ-163

National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.


2 p. NASA/Washington, Office of Space Science and Applications, Memorandum, from SB/Planetary Quarantine Officer-Bioscience Programs Lawrence B. Hall to SL/Viking Program Manager-Planetary Programs, March 12, 1970

I Author II Title III NASA/Washington Memorandum

Keywords: deviation; Viking; memorandum; approval

PQ-164

National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.


2 p. NASA/Washington, Office of Space Science and Applications, Memorandum from SB/Planetary Quarantine Program Officer Lawrence B. Hall to Planetary Quarantine Advisory Committee Chairman and Members, July 15, 1970

I Author II Title III NASA/Washington Memorandum

Keywords: PQAC; memorandum; Atlanta; agenda
National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.

1 p. NASA/Washington, Office of Space Science and Applications Memorandum from SB/Planetary Quarantine Officer-Bioscience Programs Lawrence B. Hall, to SL/Viking Program Manager-Planetary Programs, July 30, 1970

I Author II Title III NASA/Washington Memorandum

Keywords: memorandum; Viking; sterilization; alternative

Karolinska Institutet, Stockholm, Sweden.
March 13, 1970

Carl -Coran Heden, Letter of March 13, 1970, to the Members of the Panel on Planetary Quarantine

I Author II Letter

Keywords: Letter; Heden; COSPAR; Planetary Quarantine Panel; P_g; P_r; Contamination log
National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.
Jan. 6, 1969.

I Author II NASA/Washington Letter

Keywords: SSB; letter; Pr; D-values; status; Pg

National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.
August 20, 1969.

I Author II NASA/Washington Letter

Keywords: SSB; P(N); letter; Prague; Cospar
PQ-169

National Aeronautics and Space Administration, Washington, D.C.
December 4, 1969.
4 p. NASA/Washington Letter from Lawrence B. Hall, Planetary Quarantine Officer, to Mr. George Derbyshire, Space Sciences Board of the National Academy of Sciences, Washington, D.C., Dec. 4, 1969

Author II NASA/Washington Letter

Keywords: SSB; letter; PQ status; Tg; T-period; N

PQ-170

National Aeronautics and Space Administration, Washington, D.C., Office of Space Science and Applications.
March 24, 1970.
2 p. NASA/Washington Letter from Lawrence B. Hall, Planetary Quarantine Officer-Bioscience Programs to Mr. George Derbyshire, Executive Secretary, Space Science Board of the National Academy of Sciences, Washington, D.C., March 24, 1970

Author II NASA/Washington Letter

Keywords: Pg; SSB; Woods Hole; letter
PQ-171


I Author II Title III NASA/Washington Memorandum

Keywords: Viking; D values; memorandum; requirements

PQ-172


I-V Authors VI Title VII JPL Paper

Keywords: Test; micrometeoroid; JPL; dislodgement; survival

I Author II Title III AVCO Corp. Report IV NASA Contract No. NAS8-20682

Contents: Experimental Program; Sterilization Certification Plan; Suggested Areas Requiring Further Investigation

Keywords: AVCO; Mars; Lander; Facility; Test
PQ-175

Martin Marietta Corporation, Denver, Colorado, Denver Division.
Martin Marietta Corporation Viewgraphs from Martin Marietta Presentation on Viking Planetary Quarantine Program to NASA Headquarters on October 22, 1969

I Author II Title III MMC Viewgraphs

Keywords: Martin Marietta; Viking; Mars; VLC; PQ Program; Meeting

PQ-176


I Author II Title III NAS-NRC/SSB Memorandum

Keywords: SSB; Woods Hole; P_g; Report; Mars; Conservatism
PQ-177

National Aeronautics and Space Administration, Washington, D. C.
21 p. NASA Special Publication SP-8010

I Author II Title III NASA SP

Contents: State-Of-The-Art, Development of models, choice of parameters for models, surface pressure, composition and molecular mass, temperature, density, gravity; Criteria; References

Keywords: Mars; Atmosphere; Model; Density; Gravity; Composition

PQ-178

Viking Project Management.
1973 Viking voyage to Mars.
(Reprint from the November 1969 issue of Astronautics & Aeronautics: 30-59)

I Author II Title III Reprint

Keywords: Viking; Mars; Mission; objectives; Science
Jet Propulsion Laboratory, Pasadena, California. Viking orbiter science briefing. NASA Viking Orbiter Science Briefing, September 12, 1969

I Author II Title III NASA/VO Briefing

Keywords: Viking; VO; Meeting; Science Package; JPL

NASA/Langley Research Center, Hampton, Virginia, Viking Project Office.


128 p. NASA/Langley Viking Project # N73-106-0, Feb., 1969

I-IV Authors V Title VI NASA/Langley Viking Project

Contents: Interplanetary Environment; Magnetic Field; Near-Mars Environment (300 KM - 35,000 KM); Mars Environment; Orbital, Physical, and Astrodynamical Data

Keywords: Viking; Mars; Design Criteria; Engineering Model; LaRC
PQ-181


NASA/Langley Viking Project # M73-115-0, Sept., 1969

I Author II Title III NASA/Langley Viking Project

Contents: Preliminary Design Payload; Mission Description; Spacecraft Description; Environmental Considerations; Special Considerations; Schedule; Appendix, additional orbiter engineering constraints

Keywords: Viking Project Plan; Spacecraft design; mission description; Mars; LaRC

PQ-182


I-IV Authors V Title VI JPL Tech. Report

Contents: Capsule Description; Assembly and Test; Sterilization Process Determination; Microbiological Monitoring; Sterilization Test Results; Conclusions; Recommendations for Future Programs

Keywords: JPL; CSAD; Sterilization; Assay; Sterilization Tests
PQ-183

Fox, D.
PQ requirements for planetary missions. Sections A - E Paper by D. Fox, Aug. 20, 1970

I Author II Title III Paper

Keywords: Pg; Pc; period of biological interest; (Planets)

PQ-184


I-II Authors III Title IV NASA/OART Working Paper

Keywords: entry heating; Mars; survivability; Ames
The Boeing Company, Seattle, Washington.

Release of microorganisms from solids after simulated hard landings, by
S. J. Fraser, R. L. Olson, and R. H. Green. N.D.
9 p. The Boeing Company, Seattle, Washington, Abstract

I-IV Authors V Title VI The Boeing Company Abstract

Keywords: Boeing; Test; impact; f; g
PQ-187

Beckman Instruments, Inc., Fullerton, California, Advanced Technology Operations.

I Author II Title III Beckman Instruments, Inc., Tech. Proposal

Contents: Technical Management; Technical Approach; Resumes; Selected References

Keywords: Beckman; proposal; Viking; L

PQ-188

Beckman Instruments, Inc., Fullerton, California, Advanced Technology Operations.
Project Viking planetary quarantine analysis program. N.D.

I Author II Title III Beckman Instruments, Inc., Addendum

Contents: Answers to NASA Questions; Beckman Annual Report; ATO Brochure

Keywords: Beckman; proposal; Viking; Meeting; LaRC
NASA/Manned Spacecraft Center, Houston, Texas.
Apollo interior spacecraft sampling. Dec. 11, 1970.


Keywords: bioburden; Houston; Species; Apollo; sampling

---

Jet Propulsion Laboratory, Pasadena, California.
Jet Propulsion Laboratory, Pasadena, California Project Document # PD 610-18, Part I, Feb. 11, 1970

I-III Authors IV Title V JPL Project Document

Contents: Organization and Responsibilities; Probability of Contamination, Analysis Plan; Documentation; Data Treatment; Subcontractor PQ Requirements; Facilities; Schedules; New Technology

Keywords: Planetary Quarantine Plan; MM '71; Jet Propulsion Laboratory
Martin Marietta Corporation, Denver, Colorado, Denver Division.
Viking '75 project planetary quarantine plan. August 20, 1970.
6 Sections, with appendices, tables, & figures
Martin Marietta Corporation, Denver Division Coordination Draft # PL-3701009, August 20, 1970

I Author II Title III MCC Coordination Draft IV NASA Contract no. NAS1-9000

Contents: Applicable Documents; Viking Project Integration; Viking Lander Capsule System; Viking Orbiter System

Keywords: PQ Plan; Viking '75; Martin Marietta Corporation

Exotech Systems, Inc., Washington, D. C.
Review of planetary quarantine parameter probability of growth \( P_g \),
by Samuel Schalkowsky.

I-II Authors III Title IV Exotech Systems, Inc., Paper

Keywords: SSB; Woods Hole; Meeting; Minutes; \( P_g \)
National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications. 
Revision of the value of $P_g$ for Mars. Aug. 12, 1970. 
1 p. NASA/Washington, Memorandum, from SB/Lawrence B. Hall, Planetary Quarantine Officer to SL/Earl Glahn, Mariner 1971 Program Manager, August 12, 1970 

Keywords: Mariner '71; Mars; $P_g$; Memorandum; Woods Hole; SSB
PQ-195

NASA/Langley Research Center, Hampton, Virginia, Viking Project Office. Viking 75 project. (Viking mission definition no. 3), by A. Thomas Young. March 13, 1970.
37 p. NASA/Langley Research Center, Viking Project Office, Mission Definition No. 3, M75-123-0, March 13, 1970

I-II Authors III Title IV NASA/Langley Mission Definition

Contents: Scientific Objectives; Science Requirements; Landing Sites; Lifetime; Strategy for the Use of Two Spacecraft; Mission Definition Schedule

Keywords: Viking; Project Plan; Langley Research Center; Science Package
Martin Marietta Corporation, Denver, Colorado, Denver Division.
Viking 75 lander system materials and processes plan, (coordination-copy).
July 1, 1970.
Martin Marietta Corporation, Denver Division, Coordination-Copy No. PL-3703005, July 1, 1970

Author: II Title III MMC, Denver Division Coordination-Copy

Keywords: Viking; DRL; Martin Marietta Corporation

---

Martin Marietta Corporation, Denver, Colorado, Denver Division.
7 Sections, with figures Martin Marietta Corporation, Denver Division, Coordination-Copy, Management Review Draft, No. PL-3701045, Nov. 16, 1970

Author: II Title III MMC, Denver Division Coordination-Copy

Contents: Applicable Documents; Approach to Contamination Control; Major Sources of Organic Contamination and Methods of Control; Additional Sources of Organic Contamination and Methods of Control; Other Contamination Sources and Methods of Control

Keywords: Viking; Contamination Plan; DRL; Martin Marietta Corporation
American Institute of Biological Sciences, Washington, D.C., Planetary Quarantine Advisory Committee.

Semiannual NASA spacecraft sterilization technology seminar. April, 1970.

American Institute of Biological Sciences (AIBS), Planetary Quarantine Advisory Committee, Abstracts, (Semi-Annual NASA Spacecraft Sterilization Technology Seminar, held in Atlanta, Georgia, April 15, 16, 1970)

I Author II Title III AIBS, Planetary Quarantine Advisory Committee, Abstracts

Keywords: American Institute of Biological Sciences (AIBS); Seminar; Atlanta; Agenda

Exotech Systems, Inc., Washington, D.C.


I Author II Title III Exotech Systems, Inc., Memorandum

Keywords: Memorandum; Draft; Exotech; Comments; Mariner; Mars; 1971; Pre-launch Analysis
PQ-201


Martin Marietta Corporation, Denver Division, VIKING: Status of Viking Analyses

I. Author    II. Title    III. MMC Viking Analyses

Contents: Potential Contamination Events; JPL Analyses (MM71 and Viking); MMC Analyses; Summary

Keywords: MMC; Viking; PQ; Analysis; Model; Entry; Ejecta; Recontamination; View Graphs; Planetary Quarantine Working Group

PQ-202


1 p. NASA/Washington, D. C.; Letter from Lawrence B. Hall/Planetary Quarantine Officer to Mr. Samuel Schalkowsky, Director Exotech Inc., Systems Research Division, Washington, D. C., March 26, 1970

I. Author    II. NASA/Washington, Letter

Keywords: Space Science Board; P_g; P_r; Mars; Planetary Quarantine Requirements
PQ-203

National Aeronautics and Space Administration, Washington, D. C.
Minutes of conservatism meeting. Feb. 11, 1971:
2 p. NASA/Washington Memorandum, from SB/Planetary Quarantine Officer--Viking, to Distribution List (concerning the meeting of L. Hall, D. Fox, L. Daspit, J. Stern, R. Green, S. Schalkowsky, A. Neill and E. Bacon at NASA on Jan. 12, 1971 to discuss Conservatism in the Application of PQ Requirements)

I Author II Title III NASA/Washington Memorandum

Keywords: Memorandum; SB; Viking; Minutes; Conservatism

PQ-204

April 7, 1970.

I Author II NAS-NRS, Space Science Board Letter

Keywords: Space Science Board; PQ; Quarantine period; & missions; Mars; rate of consumption of $g_{pc}$
PQ-205


Contents: Mission Description; Mathematical Model; Analysis and Allocation of PC; Small Population Sources

PQ-206


Keywords: Lunar; Biological; Organic; Contamination; Policy; Directive
PQ-207

National Aeronautics and Space Administration, Washington, D. C.

I Author II Title III NASA Policy Directive

Keywords: Biological; Contamination; Policy; Directive; NASA

PQ-208

American Institute of Biological Sciences, Washington, D. C.
American Institute of Biological Sciences (AIBS), Planetary Quarantine Seminar, Abstracts, (Semi-Annual NASA Spacecraft Sterilization Technology Seminar, held in Williamsburg, Virginia, Dec. 1, 2, 1970)

I Author II Title III AIBS, Planetary Quarantine Seminar Abstracts

Keywords: Planetary Quarantine Seminar; Abstracts; Williamsburg; American Institute of Biological Sciences
National Aeronautics and Space Administration, Washington, D.C., Space Science and Applications.

Keywords: COSPAR; Space Science Board; Post-launch; MM'64

National Aeronautics and Space Administration, Washington, D.C.

Keywords: COSPAR; Space Science Board; Post-launch; VM'67
National Aeronautics and Space Administration, Washington, D. C.

Post-launch analysis report: Mars Mariner '69.  

Keywords: COSPAR; Space Science Board; Post-launch; MM'69

Nikander, J.

Some problems posed by the Planet Venus, by J. Nikander.  

Keywords: GWUBSCP; Venus; surface; atmosphere
PQ-213

Cameron, R. E.
Bacterial growth in agar subjected to freezing and thawing, by R. E. Cameron, G. B. Blank and N. H. Horowitz.

I-II Authors IV Title V GWUBSCP Abstract

Keywords: GWUBSCP; Horowitz; Bacteria; Growth; Freezing; Thawing

PQ-214

Cornell, R. G.

I-II Authors III Title IV GWUBSCP Abstract

Keywords: GWUBSCP; contamination; models; estimation
PQ-215

Phillips, G. B.

I Author II Title III GWUBSCP Abstract

Keywords: GWUBSCP; sampling; vacuum probe; Becton, Dickinson; NASA; Langley

PQ-216

Martin Marietta Corporation, Denver, Colorado.

I Author II Title III MMC Document Development Status (PQ)

Keywords: Viking; Martin Marietta Corporation; Document; Status
Battelle Memorial Institute, Columbus, Ohio.
1 p. The George Washington University-Biological Sciences Communication Project Abstract, from Battelle Memorial Institute on Research conducted from 1 Sept. 1968 to 30 June 1970

Keywords: Battelle; Report; Spacecraft; materials; nutrient; fungicide; Abstract

National Aeronautics and Space Administration, Washington, D. C.
Outbound planetary biological and organic contamination control: Policy and responsibility.
3 p. NASA Policy Directive # NPD 8020.10A

Keywords: NPD 8020.10A; Policy Directive; Directive; NASA
Exotech Systems, Inc., Washington, D. C.
Comments on B. L. Swenson's report, S/C component survivability during entry into the Jovian atmosphere.
Nov. 20, 1970.
1 p.

I Author II Title III Exotech Systems, Inc., Memorandum

Keywords: Memorandum; Comments; Exotech; Swenson; Survivability; Entry; Jovian

Exotech Systems, Inc., Washington, D. C.
Exotech tasks reportable at next semi-annual NASA spacecraft sterilization seminar.
2 p.

I Author II Title III Exotech Systems, Inc., Memorandum

Keywords: Seattle; Memorandum; Exotech; Listing; Tasks; Semi-Annual Seminar
PQ-221

NASA/GSFC, Greenbelt, Maryland.
Planetary Explorer/Venus mission. Section 7 - Planetary quarantine.
NASA/GSFC, Greenbelt, Maryland, Planetary Explorer/Venus Mission,
Report, Section 7 - Planetary Quarantine

I Author II Title III NASA/GSFC Report

Contents: Requirements; Assessment; Procedures and Facilities;
Documentation; Orbital Maneuvers; Contamination Danger

Keywords: Planetary Explorer; Analysis; Venus; Report; Goddard
Space Flight Center (GSFC)

PQ-222

Exotech Systems, Inc., Washington, D. C.
Review of Section 7 of a Report on Planetary Explorer/Venus
3 p. Exotech Systems, Inc., Washington, D. C., Memorandum,
to NASA, Code SL, March 11, 1971

I Author II Title III Exotech Systems, Inc., Memorandum

Keywords: Memorandum; Exotech; Planetary Explorer; Venus; Comments;
Analysis
PQ-223

National Aeronautics and Space Administration, Washington, D. C.

Review of section 7 planetary quarantine of a report on planetary


Planetary Quarantine Officer, to GSFC/Paul Marcotte THRU SL/Ronald

Toms, March 11, 1971

Author II Title III NASA/Washington, Memorandum

Keywords: Memorandum; SL; Planetary Explorer; Venus; Comments; Phase A

PQ-224

California Institute of Technology, Pasadena, Calif., Jet Propulsion Lab.

March 9, 1971.

2 p. Jet Propulsion Lab., Pasadena, Calif., Letter from Dan

Schneiderman, Manager/Mariner Mars 1971 Project, to SL/Earl W. Glahn,

MM 71 Program Manager, NASA/Washington, March 9, 1971 and Enclosure

date March 4, 1971

Author II JPL Letter and Enclosure

Keywords: Letter; JPL; MM '71; Pre-launch Analysis; Revision
PQ-225

NASA/Ames Research Center, Moffett Field, California.
Pioneer program: Pioneer F/G planetary quarantine plan, Revision 1.
7 p. NASA/Ames Research Center, Moffett Field, California, Document No. PC-204, Revision no. 1, Jan. 15, 1971

I Author II Title III NASA/Ames Document

Contents: Scope; Applicable Documents; Planetary Quarantine Requirements; Activities Plan; Contractor Planetary Quarantine Requirements; Documentation; Data Treatment

Keywords: Ames; Pioneer; Planetary Quarantine Plan; Jupiter

---

PQ-226

Jet Propulsion Laboratory, Pasadena, California.
Planetary quarantine analysis for an outer planets mission, by C. C. Gonzalez and W. Stavro.
1 p. Jet Propulsion Laboratory, Pasadena, California, Abstract, Feb., 1971

I-III Authors IV Title V JPL Abstract

Keywords: Jet Propulsion Lab.; Outer Planet Planetary Quarantine; Seattle; COSPAR; Abstract
PQ-227

Sandia Laboratories, Albuquerque, New Mexico.
April 8, 1971.
1 p. Sandia Laboratories, Albuquerque, New Mexico, Letter from H. D. Sivinski, Manager, Planetary Quarantine Dept. to Lawrence B. Hall, Planetary Quarantine Officer, NASA Headquarters, April 8, 1971

I Author II Sandia Laboratories Letter

Keywords: Sandia; Letter; Seattle; Title; COSPAR; Papers

PQ-228

April 7, 1971.

I Author II U.S. Dept. of Health, Education, and Welfare, Letter

Keywords: Favero; Letter; Phoenix; Seattle; COSPAR; Paper
PQ-229

National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.
April 14, 1971.
1 p. NASA/Washington, Letter, from Lawrence B. Hall, Planetary Quarantine Officer to Dr. Wolf Vishniac, Dept. of Biology, University of Rochester, April 14, 1971

Author II NASA/Washington Letter

Keywords: NASA; Hall; Letter; Seattle; Vishniac; COSPAR

PQ-230

National Aeronautics and Space Administration, Washington, D. C.
Revision A of Mar '71 Planetary quarantine plan.
April 15, 1971.
1 p. NASA/Washington, Memorandum, from Earl W. Glahn SL/Manager, Mariner Mars '71, to SL/Chief, Planetary Quarantine, April 15, 1971(with 2 attachments)

Author II Title III NASA/Washington Memorandum

Keywords: Memorandum; NASA/SL; Mariner Mars '71; Revision A; Planetary Quarantine Plan
PQ-231
The Boeing Company, Seattle, Washington.

I-III Authors IV Title V The Boeing Co., Abstract
Keywords: JPL; COSPAR; Seattle; Abstract; D. M. Taylor; Erosion; Release

PQ-232
Jet Propulsion Laboratory, Pasadena, California.
1 p. Jet Propulsion Laboratory, Pasadena, California, Abstract, Feb., 1971

I-III Authors IV Title V JPL Abstract
Keywords: COSPAR; Seattle; Abstract; JPL; Mansour; Recontamination
PQ-233

Jet Propulsion Laboratory, Pasadena, California.
A re-evaluation of material effects on microbial release from solids,
by D. M. Taylor, S. J. Fraser, E. A. Gustan, R. L. Olson, and R. H.
1 p. Jet Propulsion Laboratory, Pasadena, California, Abstract,
Feb., 1971

I-VI Authors VII Title VIII JPL Abstract

Keywords: P; Jet Propulsion Laboratory; COSPAR; Seattle; Abstract;
Taylor

PQ-234

Naugle, John E.
1 p. Naugle, John E., Letter from, to Mr. Charles H. Townes, Chairman,
24, 1970

I Author II Letter from John E. Naugle

Keywords: NASA; Space Science Board; P; Letter; Woods Hole
PQ-235


I Author II Title III NASA/Washington Memorandum

Keywords: NASA/SI; Memorandum; Fox; Review; Viking; Planetary Quarantine Plan; Schedule

PQ-236


I Author II U. S. Dept. of Health, Education, and Welfare, Letter

Keywords: Favero; Phoenix; Letter; Buried load; grinder
PQ-237

National Aeronautics and Space Administration, Washington, D.C., Office of Space Science and Applications.
March 31, 1971.
2 p. NASA/Washington, Letter, from Lawrence B. Hall, Planetary Quarantine Officer, to Mr. Leo Daspit, Viking Program Office, Langley Research Center, Hampton, Va., March 31, 1971

I Author II NASA/Washington, Letter

Keywords: Letter; NASA/SP; Policy; Viking; Allocation; UV

PQ-238

Martin Marietta Corporation, Denver, Colorado, Denver Division.
Martin Marietta Presentation on Space Recontamination of Viking and Lander Capsule following Bioshield Release, at Langley Research Center, 1971

I Author II Title III Martin Marietta Presentation

Keywords: Martin Marietta; Presentation; Recontamination; Viking; Bioshield Release; P_c; UV; Langley
PQ-239

National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.
1 p. NASA/Washington, Memorandum, from SL/Planetary Quarantine Officer Lawrence B. Hall, to SL/Program Manager, Mariner Mars '71 and SL/Program Manager, Viking '75, Jan. 8, 1971

I Author II Title III NASA/Washington, Memorandum

Keywords: NASA/SL; Memorandum; PG; Mars

PQ-241

National Aeronautics and Space Administration, Washington, D. C.
Outbound spacecraft: Basic policy relating to lunar and planetary contamination control. Sept. 6, 1967.

I Author II Title III NASA Policy Directive

Keywords: Biological; Contamination; Policy; Directive; National Aeronautics and Space Administration
Estimation of encapsulated (buried) microbial burden, by Samuel Schalkowsky.
2 p. Paper presented at the AIBS Planetary Quarantine Committee Meeting, Denver, Colo.,

I-II Authors III Title IV Citation

Denver; buried burden; Exotech; estimation; PQAP

Probability of microbial release, by Samuel Schalkowsky.
7 p. Progress Report, presented at the AIBS Planetary Quarantine Committee

I-II Authors III Title IV Citation

Denver; PQAP; Pr; Exotech; Viking; Mars
PQ-244


I-II Authors III Title IV Memorandum

Memorandum; Exotech; Mariner Mars '71; post launch analysis; review

PQ-245

California Inst. of Technology, Pasadena, Calif., Jet propulsion lab.

I-III Authors IV Title V Series note

Mariner Mars '71; post launch analysis; Jet Propulsion Lab; Mars
California Inst. of Technology, Pasadena, Calif. Jet propulsion lab.


I-II Authors III-VI Titles VII-X Series notes

Mariner Mars '71; Jet Propulsion Lab.; analysis; memoranda; biological assay; efflux ejecta

PQ-247

Levinthal, Elliott

Viking '75 project mission design requirements, objectives and constraints, document no. IR-3720055, letter from E. Levinthal of Stanford University Medical Center, Dept. of Genetics to C.H. Robbins, NASA/Langley Research Center, May 21, 1971. 2 p.

I Author II Title III Series note

Quarantine period; orbit lifetime; Viking; Levinthal; letter
PQ-248

California Inst. of Technology, Pasadena, Calif. Jet propulsion lab.
Mariner Mars 1971 spacecraft contamination control plan, by M. R. Christensen.

I-II Authors III Title IV Series note

Jet Propulsion Lab.; report; Mariner Mars; contamination control; cleaning

PQ-249

Martin Marietta, Denver, Colo. Denver division, Aerospace group.
Viking 75 project planetary quarantine documentation integration and control status.
6 Sections [PQ Milestone Document; PQ Document Tree; PQ DRL's; PQ DRD's; PQ Document Schedules; PQ Pert Net]. 1971

I Author II Title

Viking; MMC; report; documentation control; PQ schedule; milestones
PQ-250


I Author II Title III Series note IV Contract

PQ Plan; Viking; Langley; draft

Contents: 1. Introduction; II. Applicable Documents; III. Viking Project Integration; IV. Viking Lander Capsule System; V. Viking Orbiter System; VI. Viking Launch Vehicle System, Appendix A. Planetary quarantine status (PQS) and directory (PQD) systems and Appendix B. Planetary quarantine plan glossary.

PQ-251


I Author II Title

Viking; Langley; burden; prediction; buried; MMC; presentation
PQ-252


I-II Authors III Title IV Subject-Developments of NASA PQ Program. V Series note
Space Science Board; letter; NASA/Hdqts.; PQ status; Odishaw

PQ-253


I Title II Series note
General Electric; data; management; Viking; Langley
PQ-254

Martin Marietta Corp., Denver, Colo. Denver div., Viking project

Planetary quarantine requirements, by A.A. Rothstein.

23 p. [Charts and illustrations] n.d.

I-II Authors III Title IV (Period of Quarantine: 20 years, beginning Jan. 1, 1969)

MMC; Viking; presentation; Langley; PQ requirements; constraints; vu graphs

PQ-257

National Aeronautics & Space Admin., Washington, D.C. Office of Space Sci. & Applications,
Biosci. programs. PQ program officer.
Comments on draft Viking planetary quarantine plan, by Lawrence B. Hall.

I-II Authors III Title IV Series note

NASA/Hdqts.; PQ plan; Viking; comments; memorandum
PQ-258


I-II Authors III Title IV Series note
NASA/Hqts.; memo; Viking; sterilization plan; comments; PQAP

PQ-259


I-II Authors III Title IV JPL, Schneiderman) NASA/Hqts.; Mariner Mars '71; assay plan; approval; JPL; letter
National Aeronautics & Space Admin., Washington, D.C. Office of space sci. and applications.
Biosci. programs, Deputy planetary quarantine officer.
Comments on preliminary microbiological assay and monitoring plan, by Arthur H. Neill.

I-II Authors III Title IV Series note

NASA/Hdqts.; Mariner Mars '71; assay plan; comments; approval; memo.

Letter from Dan Schneiderman to Earl W. Glahn, July 30, 1970.

I-II Authors III Title

Jet Propulsion Lab.; Mariner Mars '71; assay; letter
PQ-262


Letter from Arthur H. Neill to CDC-Phoenix Labs, Attention: Dr. Favero, August 4, 1970.


PQ-263


PQ Parameters for Planets. n.d.

1 p. PQ Parameters for Planets.

PQ: P_c; NASA/Hdqts.; status; Mars; Venus; Mercury; Jupiter; Saturn; parameters
PQ-264

National Aeronautics & Space Admin., Washington, D.C.
Planetary quarantine status for approved planetary missions, n.d.

I Author II Title III Series note

NASA/Hdqts.; PQ constraints; P_c; PQ plans; status; Viking; Mariner Mars; Pioneer; M-V-M

PQ-265

National Aeronautics and Space Admin., Washington, D.C. Planetary Quarantine Officer.
Minutes of conservatism meeting, Memorandum on...

I Author II Title III Memorandum

NASA/Headquarters; memo; conservatism = safety margins; meeting; Viking; buried load; P_r
PQ-266

Major planetary quarantine program activities.
1 p. Agenda, [Dec. 1970]

I Author II Title III Series note

NASA/Headquarters; agenda; PQAP; Atlanta; Seattle; program planning

PQ-267

Fifth quarterly progress report, contract NASw-2062, Planning, evaluation and
analytical studies to implement planetary quarantine requirements, by E.J. Bacon.

I- II Authors III Title IV Series note

Exotech; quarterly report; progress
PQ-268


I Author II Title III Series note

NASA/Headquarters; program planning; SSB; agenda

PQ-269


I-II Authors III Title IV Series note

MVM; JPL; report; bias; Mercury; Venus; maneuver; impact; P(r); memo.
PQ-270

California. Institute of Technology, Pasadena, Calif., Jet propulsion lab.

I-II Authors III Title IV Series note
Letter; MVM; P(r); Mercury; Venus; impact; JPL; Green; Clarke

PQ-271

Microbiological contamination log for planet Venus, by E.J. Bacon.

I-II Authors III Title IV Series note
Exotech; log; Venus; contamination
PQ-272

Authors III Title IV Series note
Exotech; log; Mars; contamination

PQ-273

Authors III Title IV Series note
NASA/Headquarters; Hall; SSB; policy; parameter values; $P_G$; Mercury; outer planets; deflection; T
PQ-274


I Author II Title III Series note
Exotech; report; N; COSPAR; Mars; P_g; T; P(n)

PQ-275

Definition of probability of planetary contamination, Memorandum from E. Bacon to L.B. Hall. July 24, 1970.

I-II Authors III Title IV Series note
Exotech; memo; P_c; definitions; COSPAR
PQ-276

Hall, Lawrence B.

I Author II Title III Series note
Hall; report; PQ Program; policy; history; status; London; COSPAR

PQ-277

California. Institute of Technology, Pasadena, Calif. Jet propulsion lab.

I-IV Authors V Title of Letter VI Title of Memo VII Series note
Letter; JPL Memo; JPL; MM '71; pre-launch analysis; revision; bio-burden; parameterer values; spacecraft efflux ejecta
PQ-278
L.B. Hall presentation to Space Science Board, August 20, 1971.
9 VuGraphs
I-II Authors III Title
SSB; NASA/Headquarters; L.B. Hall; vu graphs; policy; Pioneer; USSR; Sagan; Mercury;
presentation; parameters; values; model

PQ-279
Sixth quarterly progress report, contract NASw-2062, Planning, evaluation and
analytical studies to implement planetary quarantine requirements, by E.J. Bacon.
Includes Draft Specification.
I-II Authors III Title IV Series note
Exotech; report; status; ETO; m
specification
Planetary Quarantine Advisory Panel action items/suggestions: June 1971.

4 p. PQAP Action Items/Suggestions (Seattle, Wash.), June 1971

Title II Series Note

PQAP; Seattle; minutes; meeting; P(r); m_b; d-value; suggestions


Sign off on the Mariner Mars '71 post launch analysis, Memo from L.B. Hall.


Authors Hall; memo; MM'71; post launch analysis; PQO; approval
PQ-284

Hall, Lawrence B.

Potential cost of planetary quarantine. n.d.

1 p.

I Author II Title

report; NASA; cost; Viking; Jovian; Mars

PQ-285

Hall, Lawrence B.

Status of thermoradiation, n.d.

1 p.

I Author II Title

report; NASA; thermoradiation; sterilization; Sandia; Viking; cost
PQ-286

Letter from L.B. Hall to Dr. Elliott C. Levinthal, Stanford University, Sept. 13, 1971.

I-II Authors III Title

NASA; PQO; letter; Viking; bioshield; UV; P_g

PQ-287

Questions for PQAP, 9/21/71
1 p.

I Title

PQAP; agenda; KSC; P(r); parameter values; m_b
PQ-288

Documented definitions of planetary contamination, by E.J. Bacon

I-II Authors III Title IV Series note

Exotech; Bacon; memo; definition; P_c; Woods Hole

PQ-290

Memorandum from E.J. Bacon to Job 053 File on notes — NASA presentation, August 27, 1970.

I-II Authors III Title IV Series note

Exotech; Bacon; memo; presentation; P_g; Viking
PQ-292
(see revised PQ-11)
National Aeronautics and Space Admin., Washington, D.C. Office of space sci. & application
Planetary programs.
Letter from L.B. Hall to E. Bacon on Viking document M75-127-1 revision.

I-II Authors III Title IV Series note

NASA/Headquarters; Hall; Viking; document; review

PQ-293
National aeronautics and space administration, Washington, D.C. Office of space science
and applications.
Letter to Dr. Charles H. Townes, SSB, on planetary quarantine policies.

I Author II Title III Series note

Letter; Naugle; SSB; policy; request; review; P(g); Mercury; outer planets;
bus deflection
PQ-294


I-II Authors III Title IV Series note

Hall; memo; policy; revision; authorization; SSB; official

PQ-295


I-II Authors III Title IV Series note

PQO; Hall; PQO; SSB; Hoffman; memo; policy; review; opinion; P(g); Mars; SAG; Goody
PQ-296

Ad hoc Committee (Outer Planet) for Science Advisory Group.


I-II Authors III Title IV Series note

SAG; report; outer planets; PQ requirements; Jupiter; Saturn; Uranus; Neptune; penalty; Goody

PQ-297


2 pp. Letter to LB Hall, PQQ, Code SL

I-II Authors III Title IV Series note

Exotech; letter; comments; review; Viking; PQ provisions; Hall; Bacon
PQ-298


Microbial growth in simulated Martian environment, by E.J. Bacon.
1 page. Memorandum to 053 file, July 20, 1970.

I-II Authors III Title IV Series note

Bacon; Mars; memo; atmosphere; survival; P(uv); P(vt); test; experiment; data

PQ-299


Documented definitions of planetary contamination, by E.J. Bacon.

I-II Authors III Title IV Series note

Bacon; Exotech; memo; Hall; definitions; Woods Hole; P_c; contamination
PQ-300

Status review—PQ support project, by E. J. Bacon.

I-II Authors III Title IV Series note

Exotech; Bacon; memo; report; meeting; status; contract; minutes

PQ-301

Microbiological contamination log for planet Mars, December 31, 1971, by E. J. Bacon.

I-II Authors III Title IV Series note

Bacon; report; log; Mars; contamination; COSPAR; Exotech
Microbiological contamination log for planet Venus, by E. J. Bacon.

Bacon; Exotech; COSPAR; report; log; Venus; contamination


Exotech; Bacon; Hall; letter; P(sa); Pioneer; review; comments; evaluation
PQ-304

Estimation of planetary contamination probabilities by non-landing vehicles, by S. Schalkowsky.  

I-II Authors; III Title IV Series note

Exotech; Schalkowsky; report; $P_c$; non-landing vehicles; probability of arrival; method; analysis

PQ-305

Exotech review of Viking planetary quarantine plan, by E.J. Bacon.  

I-II Authors III Title IV Series note

Bacon; Exotech; memo; Viking; PQ plan; review; schedule; assignment
PQ-306


I-II Authors III Title IV Series note

Schalkowsky; Exotech; memo; Pioneer; prelaunch; comments; Jupiter; Swenson

PQ-307


PQAP's support of NASA's PQ program, by E.J. Bacon.
1 p. Outline by E.J. Bacon for PQAP meeting, Cape Kennedy, Jan. 1972.

I-II Authors III Title IV Series note

Exotech; Bacon; PQAP; Cape Kennedy; note; presentation; orientation
PQ-308

Comments on MM '71 microbiological assay and monitoring plan, by E.J. Bacon.

PQ-309

PQ-310
Viking meeting September 10 and 11, 1970 at Langley Research Center, by E.J. Bacon.

I-II Authors III Title IV Series note
Exotech; Bacon; memo; minutes; meeting; LRC; Viking; MMC; vu graphs; model; bioshield; models; requirements

PQ-311
Revised PQ requirements for Pioneer F/G, from E.J. Bacon/via S. Schalkowsky.

I-II Authors III Title IV Series note
Exotech; Bacon; Schalkowsky; memo; Hall; PQ requirements; Pioneer; Jupiter; P(N); P(G); T; recontamination; revised
PQ-312

Comments on Pioneer F/G planetary quarantine plan, undated preliminary draft PC-204, from E.J. Bacon/via S. Schalkowsky.

I-III Authors III Title IV Series note

Exotech; Bacon; Schalkowsky; memo; Hall; Pioneer; PQ plan; review; comments

PQ-313

Summary of comments compiled during review of January 14 of coordination draft PQ plan as edited by D. Fox and Exotech.

I Author II Title III Series note (Memorandum on Viking '73 PQ Plan)

PQ plan; Viking; memo; comments; review; draft; Fox; Bacon; Exotech
PQ-314

National aeronautics and space administration, Washington, D.C. Office of space science and applications. Planetary quarantine officer.

Planetary quarantine certification of Pioneer F, by Lawrence B. Hall.

I-II Authors III Title IV Series note

PQO; memo; Pioneer; certification; launch; Jupiter; compliance; approval; recommendation; pre-launch analysis

PQ-315

Committee on Space Research (COSPAR). Secretariat.

1 p. Letter of transmittal.

I-II Authors III Title IV Series note

COSPAR; Secretariat; letter; MM '71; post-launch analysis
Meeting on mathematical analysis of the probability of contaminating the planets.  
April 25, 1967.  

National aeronautics and space administration, Washington, D.C.  Space science, Deputy 
assoc. administrator.  
2 p. with note. Letter/SL.
PQ-318

National aeronautics and space administration, Washington, D.C. Office of space science and applications. Planetary quarantine officer.

Spacecraft sterilization technology seminar. Letter concerning information discussed at the... by Lawrence B. Hall. Feb. 23, 1972.

I-II Authors III Title IV series note

Letter; Hall; Sagan; request; JPL; papers; seminar; reply

PQ-319

National aeronautics and space administration, Washington, D.C. Office of space science and applications. Planetary quarantine officer.

1 p. Note/SL.

I-II Authors III Title IV Series note

Note; Hall; off-loading; SSB; decision; heat sterilization; Viking; policy
PQ-320

National aeronautics and space administration, Washington, D.C. Office of space science and applications. Planetary quarantine officer.

1 p. Letter/SL.

PQ-321

Hall, Lawrence B.
Rough estimate of minimum P.Q. - Viking, by L.B. Hall. n.d.
2 p. PQ Policy Considerations.

Hall; estimate; PQ (minimum); M; Mars; Viking; policy
PQ-322


I Title II Series note

COSPAR; SSB; USSR; request; assurance; international agreement; policy

PQ-323


I-II Authors III Title IV Series note

Memo; Hall; SSB; policy; review; P(g); Mars; value; heat sterilization; meeting
PQ-324

National aeronautics and space administration, Washington, D.C. Office of space science and applications, SL/Program engineer, MVM.

1 p. Memorandum to SL/Chief, Planetary Quarantine.

I-II Authors III Title IV Series note

Memo; MVM '73; NASA/SL; P(N); Venus; deflection; aim point; atmosphere

PQ-325

3 vu graphs.

I Title II Vu graphs on PQ Parameters, Viking.

Vu graphs; Viking; parameters; P(uv); P(r); Dv; values
APPENDIX B

Thesaurus Terms
CATEGORY 1

Medium

Abstract
Agenda
Document
Draft
DRL
Guidelines
Letter
Memorandum
Minutes
News Release
Paper
Plan
Proposal
Report
Questionnaire
View Graph
### Categories 2 & 3

**Originator/Recipient**

<table>
<thead>
<tr>
<th>AIBS</th>
<th>Monsour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ames</td>
<td>MMC</td>
</tr>
<tr>
<td>AVCO</td>
<td>Martin</td>
</tr>
<tr>
<td>Apollo</td>
<td>More</td>
</tr>
<tr>
<td>Bacon</td>
<td>NASA</td>
</tr>
<tr>
<td>Battelle</td>
<td>NASA/SB</td>
</tr>
<tr>
<td>Beckman</td>
<td>NASA/SL</td>
</tr>
<tr>
<td>Becton, Dickinson</td>
<td>Neill</td>
</tr>
<tr>
<td>Boeing</td>
<td>Nelson</td>
</tr>
<tr>
<td>Brown</td>
<td>Odishaw</td>
</tr>
<tr>
<td>COSPAR</td>
<td>Phoenix (PHS)</td>
</tr>
<tr>
<td>Detrick</td>
<td>Pioneer</td>
</tr>
<tr>
<td>Exotech</td>
<td>PQAC</td>
</tr>
<tr>
<td>Explorer</td>
<td>PQAP</td>
</tr>
<tr>
<td>Favero</td>
<td>PQO</td>
</tr>
<tr>
<td>Fox</td>
<td>PQWG</td>
</tr>
<tr>
<td>General Electric</td>
<td>Sagan</td>
</tr>
<tr>
<td>Green</td>
<td>Sandia</td>
</tr>
<tr>
<td>Goody</td>
<td>Schalkowsky</td>
</tr>
<tr>
<td>GWUBSCP</td>
<td>Sneath</td>
</tr>
<tr>
<td>GSFC</td>
<td>SSB</td>
</tr>
<tr>
<td>Hall</td>
<td>Swenson</td>
</tr>
<tr>
<td>Heden</td>
<td>Taylor</td>
</tr>
<tr>
<td>Horowitz</td>
<td>USAMRDC</td>
</tr>
<tr>
<td>JPL</td>
<td>USSR</td>
</tr>
<tr>
<td>LaRC</td>
<td>Viking</td>
</tr>
<tr>
<td>Levinthal</td>
<td>Viking Quarantine Evaluation Board (VGER)</td>
</tr>
<tr>
<td>Little (A.D.)</td>
<td>Vishniac</td>
</tr>
<tr>
<td>Mariner</td>
<td></td>
</tr>
</tbody>
</table>

*B-2*
## CATEGORY 4

### Characterization of Contents

<table>
<thead>
<tr>
<th>Action</th>
<th>Listing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agreement</td>
<td>Mission Description</td>
</tr>
<tr>
<td>Allocation</td>
<td>Mission Statement</td>
</tr>
<tr>
<td>Alternative</td>
<td>Model</td>
</tr>
<tr>
<td>Analysis</td>
<td>Policy</td>
</tr>
<tr>
<td>Appreciation</td>
<td>Post-Launch Analysis</td>
</tr>
<tr>
<td>Approval</td>
<td>PQ Plan</td>
</tr>
<tr>
<td>Assay</td>
<td>PQ Provisions</td>
</tr>
<tr>
<td>Assay Plan</td>
<td>Pre-Launch Analysis</td>
</tr>
<tr>
<td>Briefing</td>
<td>Presentation</td>
</tr>
<tr>
<td>Comments</td>
<td>Recommendation</td>
</tr>
<tr>
<td>Constraints</td>
<td>Request</td>
</tr>
<tr>
<td>Contamination Log</td>
<td>Review</td>
</tr>
<tr>
<td>Contamination Plan</td>
<td>Revision</td>
</tr>
<tr>
<td>Control Drawing</td>
<td>Schedule</td>
</tr>
<tr>
<td>Correspondence</td>
<td>Sterilization Plan</td>
</tr>
<tr>
<td>Criteria</td>
<td>Status</td>
</tr>
<tr>
<td>Directive</td>
<td>Submission</td>
</tr>
<tr>
<td>Deviation</td>
<td>Task</td>
</tr>
<tr>
<td>Certification</td>
<td>Test</td>
</tr>
<tr>
<td>Definition</td>
<td>Verification</td>
</tr>
<tr>
<td>Estimation</td>
<td>Workload</td>
</tr>
<tr>
<td>Evaluation</td>
<td></td>
</tr>
</tbody>
</table>
### CATEGORY 5

**Flight Projects and Planets**

<table>
<thead>
<tr>
<th>Project</th>
<th>Planets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apollo</td>
<td>Outer Planets</td>
</tr>
<tr>
<td>Jupiter</td>
<td>Pioneer F</td>
</tr>
<tr>
<td>Mars</td>
<td>Pioneer G</td>
</tr>
<tr>
<td>Mercury</td>
<td>Planetary Explorer</td>
</tr>
<tr>
<td>MM '64</td>
<td>Pluto</td>
</tr>
<tr>
<td>MM '67</td>
<td>Saturn</td>
</tr>
<tr>
<td>MM '69</td>
<td>Uranus</td>
</tr>
<tr>
<td>MM '71</td>
<td>Venus</td>
</tr>
<tr>
<td>MVM '73</td>
<td>Viking</td>
</tr>
<tr>
<td>Neptune</td>
<td>Zond</td>
</tr>
</tbody>
</table>
Adapted from page B-5

**Category 6**

Associated Places, Organizations, etc.

- Antarctic
- Atlanta
- COSPAR
- Denver
- Houston
- Kennedy
- Leningrad
- Minnesota
- Palo Alto
- Pasadena
- Prague
- Seattle
- Tokyo
- Williamsburg
- Woods Hole
### CATEGORY 7

#### Subject Matter

- Action
- Action Items
- Aerosols
- Allocation
- Analysis
- Aseptic
- Assay
- Assay Plan
- Atmosphere
- Back Contamination
- Bacteria
- Bayesian Statistics
- Bioburden
- Bioburden Model
- Biological
- Biological Assay
- Bioshield Release
- Budget
- Burden
- Bus Deflection
- Capsule
- Certification
- Cleaning
- Clouds
- Composition
- Confidence
- Conservatism
- Constraints
- Contamination
- Contamination Control
- CSAD
- D-Value(s)
- Design
- Density
- Devices
- Diffusion
- Directive
- Dislodgement
- Efficiency
- Efflux Ejecta
- Engineering Model
- Entry
- Entry Heating
- Erosion
- Error
- Estimation
- ETO (ethylene oxide)
- Evaluation
- Experiment(s)
- Facility
- FA Cycle
- Flight Project Document
- Fracture
- Freezing
- Funds
- Fungicide
- Gaseous Sterilization
- Gravity
- Grinder
- Growth
- Hospital
- Impact
- Implications
- Interface
- International
- Lander
- Lunar
- Maintenance
- Management
- Maneuver
- Mated
- Materials
- Micrometeoroid
- Micrometeoroid Dislodgement
- Model
- N = # of Missions
- Nutrient
- Objectives
- Orbit
- Orbit Lifetime
- Organic
- Organic Inventory
- \( P_C \)
- \( P(g) \)
- \( P(N) \)
- \( P(r) \)
- \( P(uv) \)
- \( P(vt) \)
- Parachute
- Parameter
- Planets
- Policy
- Post-Launch Analysis
- Prediction
- Pre-Launch Analysis
- Proposal
- Radiation
- Rate of Consumption of \( P_C \)
- Recontamination
- Requirements
C A T E G O R Y  7
(Continued)

Relaxation
Release
Repairs
Resident
Revision
RTG
Sampling
Schedule
Science
Simulation
Small Population Sources
Solar Wind
Spacecraft
Species
Status
Sterile Repair
Sterilization
Sterilization Model
Sterilization Plan
Sterilization Tests
Submittal = Submission
Support
Surface
Survival = Survivability
T = Quarantine Period
Task
Techniques
Test
Thawing
Thermal Radiation
Thermal Vacuum
UV = Ultraviolet
Vacuum Probe

Value
Verification
View Graphs
VLC
Workload