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

TR72-09
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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\(^1\) 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:

1. Contamination constraints and quarantine requirements
2. Space Flight Project plans for fulfillment of such requirements
3. Analyses and studies related to the establishment of quarantine requirements and to their fulfillment
4. Execution of contamination and sterilization controls
5. Verification that operational requirements have been met
6. 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\(^2\). 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>
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<th>Stamp Number</th>
<th>Symbol</th>
<th>Significance</th>
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<tr>
<td>1</td>
<td>![Symbol 1]</td>
<td>Document to be included in QDS</td>
</tr>
<tr>
<td>2</td>
<td>![Symbol 2]</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
- Recepient
- 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 knowledgeable in the planetary quarantine program.
APPENDIX A

A Complete Listing of the Collection

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


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
PQ-5

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

PQ-6

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
PQ-7

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 MMC-PQWG Minutes

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

PQ-8

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


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

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
PQ-11 (rev.)

PQ-11


I-II Authors III Title IV NASA/Langley PQ Provisions

Contents: Requirements; PQ Constraints; Documentation and Data Requirements; NASA Microbiological Assays

Keywords: Viking; Mars; PQ Provisions; Langley Research Center Project Plans; Science Package

PQ-11

... NASA Planetary Provisions, Viking 75 Project M75-127-1


PQ-12


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

Contents: Science Requirements; scientific objectives; landing sites; lifetime; the use of two spacecraft, strategy for; mission definition schedule

Keywords: Viking; Mars; Langley Research Center; Mission Statement; report
PQ-16
Exotech Incorporated, Washington, D. C.
Implications of 1970 COSPAR recommendations on PQ requirements for Mars.
8 p.
Exotech Incorporated, Washington, D. C., Summary Report
no. TRSK 70-42

I Author II Title III Summary Report IV NASA Contract no. NASw-2062

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

PQ-15
Exotech, Incorporated, Washington, D. C.
5 p., with appendix Exotech, Inc., Washington, D. C.,
Planetary Quarantine Constraints, (Re-evaluation of) Intended
to Serve as Supporting Material for the Forthcoming Discussions
at COSPAR in May, 1970

I Author II Title III Exotech, Inc., PQ Constraints

Keywords: Exotech; PQ constraints; Mars; Venus; P(N); N; Pre-
COSPAR; report
PQ-17


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

Author II Title III ME Memorandum

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

PQ-18

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)

Author II Title III NASA/Ames Document

Keywords: Ames; Pioneer F/G; Planetary Quarantine Plan; Jupiter
Roper, W. D.

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

---

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


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).
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
PQ-23

NASA/Langley Research Center, Hampton, Virginia, Viking Project Office.
Viking project: Planetary quarantine provisions, by L. P. Daspit, Jr.

I-II Authors III 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

PQ-24

NASA/Langley Research Center, Hampton, Virginia, Langley Station.
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

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


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 MMC 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.
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
PQ-34

Neill, Arthur H.

I Author II Title III Draft

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

PQ-35

Martin, James S.

I Author II Title III Memorandum

Keywords: Memorandum; Viking; Planetary Quarantine Plan; Comments; Deviations; LRC; Martin
California Institute of Technology, Pasadena, California, Jet Propulsion Laboratory.
Letter from Dan Schneiderman, Manager Mariner Mars 1971 Project, to SL/Earl W. Glahn, MM 71 Program Manager, NASA

I Author II Title III Jet Propulsion Lab. Letter

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

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.
2 p. NASA Memorandum, from SB/Planetary Quarantine Officer, Bioscience Programs, to SL/Program Manager, Mariner Mars '71 Mission, 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 preliminary microbiological assay and monitoring plan. June 18, 1970.
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; efficiency factor; Memorandum
PQ-40

National Aeronautics and Space Administration, Washington, D. C.
Reallocation of $P_c$ to Viking 1975.
Aug. 12, 1970.
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); \text{PQO}; allocation

PQ-41

National Aeronautics and Space Administration, Washington, D. C.
Reallocation of $P_c$ to Mariner 1971.
Aug. 12, 1970.
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); \text{allocation}; \text{PQO}; approval
PQ-42

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

PQ-45

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

Biological sampling for Viking '73 N.D.

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

PQ-44

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

Keywords: Viking; microbiological assay; memorandum; sampling; # samples; agreement; PQO
Dr., Fox, Donald G.


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

I Author II Title III Minutes

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

PQ-47

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

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

I Author II Title III NASA Memorandum

Keywords: Viking; Planetary Quarantine Provisions; Comments; P(N); Memorandum; review; approval; PqO
PQ-48

3 p. PQAC Summary Report, February, 1969

I Title II PQAC Report

Keywords: D-values; PQAC; summary report; P; 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.  
2 p.  
Martin Marietta Corp. Letter, from Frank W. McCabe to NASA/Langley, Hampton, Virginia, including 1 Enclosure, Aug., 1970.

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.  
2 p.  
California Institute of Technology, Pasadena, California, Jet Propulsion Lab., Letter from W. E. Giberson, Mariner Venus/Mercury '73, Project Manager to Mr. N. W. Cunningham, Code SL/NASA/Washington, D. C., August 20, 1970

I Author II Letter  
Keywords:  
Mercury; Venus; MVM '73; Letter; JPL; Planetary Quarantine Plan; Planetary Quarantine Requirements; reloaction; funds
Strobel, G. K.

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

PQ-53

National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.
3 p. NASA/Washington, D. C., Office of Space Science and Applications Memorandum, from SB/Planetary Quarantine Officer to SL/Program Manager, Mariner Venus/Mercury '73, Oct. 16, 1970

Keywords: Memorandum; Mariner; Venus; Mercury; Planetary Quarantine Plan; guidelines; P(N); P9; 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: $p_c$; definition; letter; Vishniac; Antarctic
PQ-56

National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.
Aug. 27, 1970.

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\textsubscript{g}; letter; Hall; request; comments; experiments; clouds; aerosols

PQ-57

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

Comments on Pioneer F/G planetary quarantine plan, undated Preliminary Draft PC-204.

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
PQ-58

National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.
July 31, 1970.

Letter from Lawrence B. Hall to Dr. Carl Sagan, July 31, 1970

Author: NASA Letter

Keywords: Letter; Sagan; jupiter; pioneer; Hall; outer planets; requirements

PQ-59

University of Leicester, Leicester, England, Microbial Systematics Unit.
Memorandum on estimating probability parameters, by P. H. A. Sneath.
May 15, 1970.

COSPAR Panel on Planetary Quarantine, 1970 (Paper by P. H. A. Sneath)

Keywords: Sneath; COSPAR; paper; estimation; error
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

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

PQ-63

National Aeronautics and Space Administration, Washington, D. C.,
Office of Space Science and Applications.
SB concurrence on Mariner Mars 1971 project development plan. July
22, 1969.
1 p. NASA/Washington, D. C., Office of Space Science and Applica-
tions, 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
PQ-64


I Author II Title III NASA Memorandum

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

PQ-65


I Author II Title III Memorandum

Keywords: Viking; Langley Research Center; Planetary Quarantine Requirements; Model; Sterile repair; MMC; Bioburden model; Sterilization model; memo; Bacon; meeting; minutes
Comments on Sneath's memorandum on estimating probability parameters by Byron Wm. Brown, Jr., Aug. 18, 1970

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

Letter from Kenneth R. Dirks, M.D., Colonel, MC Commanding to Lawrence Hall, September 10, 1970

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

3 p. Martin Marietta Corporation, Denver Division, Minutes of PQWG Meeting, held March 18, 1970 at MMC.

I Author II Title III Minutes IV Contract no. NAS1-9000

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


I-II Authors III Title IV Abstract

Keywords: GNUBSCP, 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.
Revised PQ requirements for Pioneer F/G. July 31, 1970.

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

Keywords: Pioneer; P; P(N); Quarantine Period; Jupiter; Bacon; memo; requirements
NASA Letter from Lawrence B. Hall, Planetary Quarantine Officer to Dr. Wolf Vishniac, University of Rochester, Dept. of Biology, July 28, 1970

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

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Martin Marietta Corporation, Denver, Colorado, Denver Division.


**Keywords:** Viking; Bio Burden; model; estimation; prediction; Martin Marietta; Control Dwg.; 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.
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. Daspet, 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 MMC 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
Exotech Systems, Inc., Washington, D. C.
July 22, 1970.


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

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

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

Author: II Title: III COSPAR Abstracts

Keywords: COSPAR; Memorandum; Seattle; Paper; Approval; presentation; Neill
PQ-81

Mitchell, R. T.
Errata to preliminary flight path analysis orbit determination and
from R. T. Mitchell to Distribution

I Author II Title III Paper

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

PQ-82

National Academy of Sciences-National Research Council, Washington, D. C.,
Space Science Board.
Review of sterilization parameter probability of growth (Pg). Sept. 17,
1970.
1. NAS-NRC, Washington, D. C., Space Science Board, Memorandum, (Concerning
Review of Sterilization Parameter Probability of Growth (Pg), from D. P. Kastel,
Secretary to Participants, Sterilization Parameter Review: Probability of
Growth (Pg), Sept. 17, 1970

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

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


I Author II Title III Memorandum (NASA/Washington)

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

PQ-84

Martin Marietta Corporation, Denver, Colorado, Denver Division. Contract NAS1-9000, Meeting of planetary quarantine working group. March 5, 1970. 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.

3 p.

Exotech Systems, Inc., Washington, D.C., Memorandum from S. Schalkovsky to Lawrence Hall, July 24, 1970

I Author II Title III EXI Memorandum

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

1Q-06

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
allocation of probability of contamination.

December 3, 1970.

J. J. Bacon to S. Schalkowsky, Dec. 3, 1970

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

Trajectory acceptance and planetary quarantine certification - Mariner 1969 Mars mission.

1 p. NASA/Washington Memorandum from Orr E. Reynolds, SB/Director of Bioscience Programs to S/Associate Administrator for Space Science and Applications

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

Horowitz, N. H.

I-III Authors IV Title V Jn. Cit.

Keywords: publication; analysis; ZOND; Venus; Mars; bus deflection Horowitz; science; report; relaxation; history
NASA/Langley Research Center, Hampton, Virginia.
Planetary quarantine working group meeting of January 12-13, 1970
Langley Research Center/Viking Project Office.

PQ-92

Hagen, C. A.

I-IV Authors V Title VI GWUBSCP Abstract

Keywords: GWUBSCP; abstract; ultraviolet = UV; sterilization; Mars; P(uv)
Reynolds, M. C.

I-II Authors III Title IV GWUBSCP Abstract

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

Pflug, I. J.

I Author II Title III GWUBSCP Abstract

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

I-V Authors VI Title VII GWUBSCP Abstract

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

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.
Quantitative and qualitative microbiological profiles of the Apollo 10 and 11 spacecraft, by J. R. Puleo, G. S. Oxborrow, N. D. Fields and H. E. Hall.
November 2, 1970.

Keywords: Puleo; detection; GWUBSCP; bioburden; Apollo; Abstract

PQ-100

Sandia Laboratories, Albuquerque, New Mexico.
November 2, 1970.

Keywords: GWUBSCP; thermoradiation; sterilization; Sandia; abstract
COSPAR, Panel on Planetary Quarantine.
Potentially harmful effects of space experiments from the panel 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

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COSPAR, Panel on Planetary Quarantine.
Interim Report of the Panel on planetary quarantine (Item 12), by Dr. Heden.
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
PQ-103

National Aeronautics and Space Administration, Washington, D. C.
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; PGO; clarification; order; scope; PHS

PQ-104

National Aeronautics and Space Administration, Washington, D. C.
A study of the probability of deposits viable organisms on Mars during
7 p. NASA/Washington Letter from Homer E. Newell, Associate Administra-
tor for Space Science and Applications forwarding a NASA report to Professor
Harry H. Hess, Chairman Space Science Board - National Academy of Sciences,
Washington, D. C.

I Author II Title III NASA/Washington Letter-Report

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

I Author II Title III NASA/Washington Letter

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

Mariner Venus 67 prelaunch analysis of contamination probability, by Norman R. Haynes.

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

Author II Title III NASA/Washington Memorandum

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

Author II Title III NASA/Washington Memorandum

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


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


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.
Sterile insertion in Viking missions. April 28, 1969. 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.

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

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


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

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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
PQ-121

National Aeronautics and Space Administration, Washington, D. C.,
Office of Space Science and Applications.
2 p. NASA/Washington Memorandum from Planetary Quarantine Officer/
SB Lawrence B. Hall to Director/SL, July 28, 1969

I Author II Title III NASA/Washington Memorandum

Keywords: Memorandum; P_{c}; P_{g}; SB; P(N); Mars; Venus; Jupiter; parameter values;
SSB; official; approved

PQ-122

National Aeronautics and Space Administration, Washington, D. C.
1 p. NASA/Washington Memorandum from Walter Jakobowski SL/Viking
Program Manager, Planetary Programs to SPI/John W. Rosenberry, July
28, 1969

I Author II Title III NASA/Washington Memorandum

Keywords: Memorandum; SL; Viking; Sterilization; Facility; MAST;
utilization; rejection
PQ-123

NASA/Langley Research Center, Hampton, Virginia, Langley Station.
Decision concerning use of "MAST" type sterilization facility for the Viking Project.

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

PQ-124

Jet Propulsion Laboratory, Pasadena, California.
U.S.P.H.S.'s (N.C.D.C., Phoenix) Involvement in the Apollo Program vs inception of bioassay activity of the Viking project.
2 p. JPL/Pasadena, California Memorandum 2945N-101, July, 1969, from E. J. Sherry to L. B. Hall

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

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


1 p. NASA/Washington Memorandum, Aug. 1969, from Planetary Quarantine Officer/SB Lawrence B. Hall to Viking Program Manager/SL.

Author II Title III NASA/Washington Memorandum

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

PQ-126

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

July 31, 1969.

1 p. NASA/Washington, Memorandum from SB/Planetary Quarantine Officer to SL/Viking Program Manager, July, 1969.

Author II NASA/Washington, Memorandum

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

National Aeronautics and Space Administration, Washington, D. C.,
Office of Space Science and Applications.
Nov. 24, 1969.

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

Author II NASA/Washington Letter

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

PQ-128

National Aeronautics and Space Administration, Washington, D. C.
JPL-Martin Co. bioburden math model.

1 p. NASA/Washington Planetary Quarantine, Preliminary Agen-
da held at NASA Headquarters, Washington, D. C., Room 219, Dec.
17-18, 1969

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.

I Author II JPL/Pasadena Letter

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.

I Author II Title III Exotech Inc., Memorandum

Keywords: Memorandum; Exotech; MM '71; PQ plan; comments; review
PQ-131

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

I Author II Title III Exotech Inc., Memorandum

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

PQ-132

Sandia Laboratories, Albuquerque, New Mexico.

I Author II Sandia Laboratories, Letter

Keywords: Viking; Sandia; Letter; assay; fracture; sensitivity; adsorption; vacuum probe
Exotech Incorporated, Washington, D. C.
Visit with Al Hoffman of JPL. March 10, 1970.

I Author II Title III Exotech Inc., Memorandum

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

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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.
NASA Headquarters Funded Projects

I Author II Title III NASA Headquarters Funded Projects

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

PQ-136

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
PQ-137

TASK: Perform surveillance microbiological assays of facilities and hardware.  
NASA/Washington Task Description and Planning Sheet, Referenced from NHB 8020.12 Par 3.2(81)

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

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

PQ-138

Kereluk, K.  
Microbiological aspects of ethylene oxide sterilization, by K. Kereluk, R. A. Gammon and R. S. Lloyd.  
March 19, 1970.  
1 p.  

I-III Authors IV Title V GWUBSCP Abstract

Keywords: abstract; George Washington University-Biological Sciences Communication Project = GWBSCP; ETO; sterilization
Kereluk, K.

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

Kereluk, K.

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.
Microbiological evaluation of the vacuum probe surface sampler, by N. J. Petersen and W. W. Bond.
March 20, 1970.

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.

Keywords: George Washington University-Biological Sciences Communication Project = GWUBSCP; abstract; surface; vacuum probe; sampling; Sandia
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
Sandia Laboratories, Albuquerque, New Mexico.

I Author II Title III GWUBSCP Abstract

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

NASA/Langley Research Center, Hampton, Virginia, Langley Station.
1 p. NASA/Langley Memo. from James S. Martin, Jr./Viking Project Manager to NASA Code SB/Dr. D. G. Fox.

I Author II Title III NASA/Langley Memorandum

Keywords: Memorandum; Viking; T; clarification; agreement; Martin (J.S.)
PQ-149

National Aeronautics and Space Administration, Washington, D. C.  
Viking '73 period of planetary quarantine.  
Nov. 4, 1969.  
1 p.  
NASA/Washington Memorandum from SB/Planetary Quarantine  
Officer, Lawrence B. Hall to SL/Viking Program Manager, Nov., 1969

Author II Title III NASA/Washington Memorandum

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

PQ-150

Cornell University, Ithaca, New York, Center for Radiophysics and Space  
Research, Space Science Building.  
August 18, 1970.  
2 p.  
Cornell University, Ithaca, N. Y., Center for Radiophysics and  
Space Research, Letter from Mr. Carl Sagan, to Dr. Larry Hall, NASA, Office  
of Space Science and Applications, Washington, D. C., August 18, 1970

Author II Cornell University, Letter

Keywords: Letter; Sagan; Jovian; Planetary Quarantine Requirements; En-  
try 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

PQ-152

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

Keywords: George Washington University; Letter; More; International Law; Back Contamination
PQ-153

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

I Author II Title III NASA/Washington Memorandum

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

PQ-154

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

I 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.
3 p. Exotech Incorporated, Washington, D. C., Memorandum, from
E. Bacon to O53 File (LS), April 23, 1970

I Author II Title III Exotech Memorandum

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

PQ-156

Instruments: MS/GC unit slated for 1973 Mars landing. (News of
the $27-Billion Research Industry).
IN Industrial Research: 41, May, 1970

I Title II Jn. Cit.

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

I-III Authors IV Title V Exotech Inc. Report VI NASA Contract # NASW-2062

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

Angelotti, R.

I-VII Authors VIII Title IX Review Committee Report

Keywords: Report; Review; bioburden; model; estimation; prediction; JPL; Angelotti


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

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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: PQA C; memorandum; Atlanta; agenda
PQ-165


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

PQ-166

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
I Author II NASA/Washington Letter
Keywords: SSB; letter; Pr; D-values; status; Pg

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

1 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

1 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

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

Keywords: AVCO; Mars; Lander; Facility; Test

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Contents: Experimental Program, survivor studies, transport analysis, effects tests, witness techniques; Sterilization Certification Plan

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

3 p.

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.
Models of Mars atmosphere (1967), (NASA Space Vehicle Design Criteria [Environment]).
21 p. NASA Special Publication SP-8010

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)

Keywords: Viking; Mars; Mission; objectives; Science
PQ-179

NASA Viking Orbiter Science Briefing, September 12, 1969

Author Title NASA/VO Briefing

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

PQ-180

Authors Title 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 Research Center, Hampton, Virginia, Viking Project Office.
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

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

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

August 20, 1970.

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

PQ-184

National Aeronautics and Space Administration, Moffett Field, California,
Office of Advanced Research and Technology (OART), Mission Analysis Div.

Keywords: entry heating; Mars; survivability; Ames
PQ-185

The Boeing Company, Seattle, Washington.
Microbial release 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-186


I-III Authors IV Title V The Boeing Company Final Report

Contents: Test I; Test II; Test III

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.

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
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I Author II Title III NASA/Manned Spacecraft Center, Houston, Texas, Letter

Keywords: bioburden; Houston; Species; Apollo; sampling

PQ-190


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
PQ-191

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 MHC 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

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Exotech Systems, Inc., Washington, D. C.
Review of planetary quarantine parameter probability of growth \( P_g \),
by Samuel Schalkowsky.
Exotech Systems, Inc., Washington, D. C., Paper presented by
S. Schalkowsky at the Woods Hole Meeting, July, 1970

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

I Author II Title III NASA/Washington Memorandum

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

4 p. COSPAR, Panel on Planetary Quarantine, Report, 1967

I Author II Title III COSPAR Report

Keywords: COSPAR; report; D values
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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

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

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


3 p. NASA/Washington Memorandum, from SL/Planetary Quarantine Officer, Planetary Programs, OSSA-Lawrence B. Hall to SL/ Mariner Mars '71 Program Manager, Jan., 1971

I Author II Title III NASA/Washington Memorandum

Keywords: Planetary Quarantine Officer; Comments; Mariner; Mars; 1971; Pre-launch Analysis

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3 p. NASA/Washington Memorandum, from SL/Planetary Quarantine Officer, Planetary Programs, OSSA-Lawrence B. Hall to SL/ Mariner Mars '71 Program Manager, Jan., 1971

I Author II Title III NASA/Washington Memorandum

Keywords: Planetary Quarantine Officer; Comments; Mariner; Mars; 1971; Pre-launch Analysis

Martin Marietta Corporation, Denver Division, Coordination-Copy No. PL-3703005, July 1, 1970

Keywords: Viking; DRL; Martin Marietta Corporation

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

Keywords: Viking; Contamination Plan; DRL; Martin Marietta Corporation
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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, Colorado, Denver Division.
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; Ejecta; Recontamination; View Graphs; Planetary Quarantine Working Group

PQ-202

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March 26, 1970.

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; P; Mars; Planetary Quarantine Requirements
PQ-203

National Aeronautics and Space Administration, Washington, D. C.
Minutes of conservation 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; P_c; Quarantine period; Mars; rate of consumption of P_c
PQ-205

California Institute of Technology, Pasadena, California, Jet Propulsion Laboratory.
52 p., with appendix Jet Propulsion Laboratory, Pasadena, California, Report no. 605-87, PD 141, May 22, 1968

I-II Authors III Title IV JPL Report

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

PQ-206

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I Author II Title III NASA Policy Directive

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

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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
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I Author II Title III NASA Report

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

PQ-210


I Author II Title III NASA Report

Keywords: COSPAR; Space Science Board; Post-launch; VM'67
Post-launch analysis report: Mars Mariner '69.

United States/NASA Report to the Committee on Space Research of the International Council of Scientific Unions on The Probability of Contamination of the Planet Mars by the U. S. Mariner 1969 Mission

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 III Title IV 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

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Outbound planetary biological and organic contamination control: Policy and responsibility.
3 p. NASA Policy Directive 6 NPD 8020.10A

Keywords: NPD 8020.10A; Policy Directive; Directive; NASA
PQ-219

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

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

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

PQ-220

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

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

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

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

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 Explorer/Venus mission.  
March 11, 1971.  

I 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.  

I 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, Docu-
ment No. PC-204, Revision no. 1, Jan. 15, 1971

I Author II Title III NASA/Ames Document

Contents: Scope; Applicable Documents; Planetary Quarantine Require-
ments; Activities Plan; Contractor Planetary Quarantine Re-
quirements; 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.
Feb., 1971.
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


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

I Author II NASA/Washington Letter

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

PQ-230

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

I 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
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. Green. Feb., 1971

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

Keywords: P₄; Jet Propulsion Laboratory; COSPAR; Seattle; Abstract; Taylor

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Keywords: NASA; Space Science Board; P₄; Letter; Woods Hole
PQ-235

National Aeronautics and Space Administration, Washington, D. C., Office of Space Science and Applications.
1 p. NASA/Washington, Memorandum from Donald G. Fox, Ph.D, Planetary Quarantine Program Officer to (See Distribution List), attached, Sept. 1, 1970

I Author II Title III NASA/Washington Memorandum

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

PQ-236

February 8, 1971.

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/SB; Policy; Viking; Allocation; UV

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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
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; $P_0$; Mars

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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
PQ-242

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

PQ-243

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

1 p. Memorandum to Lawrence B. Hall, Chief, PQO/NASA from S. Schalkowsky.

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.
Mariner Mars 1971 post-launch analysis of compliance with COSPAR recommendations,
20 p. includes figures and tables. JPL Report.

I-III Authors IV Title V Series note

Mariner Mars '71; post launch analysis; Jet Propulsion Lab; Mars
PQ-246

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a. Results of microbiological assay of MM71-2 (ESF Assay 1), by A. Hoffman.

b. Results of encapsulation microbiological assay of MM71-1, by A. Hoffman.

   JPL Interoffice Memo. IOM 2945-2290, May 18, 1971.

d. Revised spacecraft ejecta efflux estimates for Mariner 71-2, by A. Hoffman.

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


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
Contents: I. 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.
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I II Authors III Title IV Subject-Developments of NASA PQ Program. V Series note

Space Science Board; letter; NASA/Hqts.; PQ status; Odishaw

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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

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

National Aeronautics & Space Admin., Washington, D.C. Office of space sci. and applications, Biosci. programs, PQ program officer. 
Viking sterilization plan, by Donald G. Fox. 
1 p. Memorandum from D. G. Fox to Planetary Quarantine Advisory Committee Members, July 15, 1970.

I-II Authors III Title IV Series note

NASA/Hdqts; memo; Viking; sterilization plan; comments; PQAP

PQ-259

National Aeronautics & Space Admin., Washington, D.C. Office of Space sci. and applications. 
Planetary programs, Mariner Mars '71, manager. 
Letter from Earl W. Glaahn to Dan Schneiderman, May 27, 1970. 
1 p. May 27, 1970

I-II Authors III Title IV JPL, Schneiderman

NASA/Hdqts.; Mariner Mars '71; assay plan; approval; JPL; letter
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I-II Authors III Title IV Series note

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

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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.

I-II Authors III Title IV Series note

NASA/Hdqts.; Mariner Mars '71; assay; letter

PQ-263


Planetary quarantine parameters. n.d.
1 p. PQ Parameters for Planets.

I Author II Title III Series note

PG; PC; 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-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


PQ-273

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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; specification
PQ-280

Planetary Quarantine Advisory Panel action items/suggestions: June 1971. 4 p. PQAP Action Items/Suggestions (Seattle, Wash.), June 1971

I Title II Series Note

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

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I-II Authors III Title IV Series note

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


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

PQ-290
Memorandum from E.J. Bacon to Job 053 File on notes — NASA presentation, August 27, 1970.
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

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

Revised and new planetary quarantine policies, by Lawrence B. Hall.


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

PQ-295

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

Telecon with Mr. Dean Kaster — Space Science Board, by A.R. Hoffman.


P: Hall; P:O; 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, PQO, 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(sat); 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.


I-II Authors III Title IV Series note

Exotech; Bacon; Neill; NASA/SB; memo; comments; review; MM '71; assay plan

PQ-309


3 p. Memorandum from S. Schalkowsky to L. Hall, July 24, 1970.....

I-II Authors III Title IV Series note

Exotech; Schalkowsky; memo; Hall; Viking; sterilization plan; review; comments; MMC
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

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

I-II Authors III Title IV Series note
Exotech; Bacon; Schalkowsky; memo; Hall; Pioneer; PQ plan; review; comments

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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
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

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.

I Title III Series note

meeting; minutes; policy; model; N; P(N); T; COSPAR; NASA; Schalkowsky

PQ-317

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

I Author II Title III Series note

Letter; note; Viking; policy; heat sterilization; M; Mars; elimination; review; SSB; Naugle
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.

...Sterilization vs. off-loading science. Note to R.S. Kraemer, by L.B. Hall.
1 p. Note/SL.

I-II Authors III Title IV Series note

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

PQ-320

I-II Authors III Title IV Series note

letter; spores; lifetime; P(vt); Hall

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
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.

PQ-324

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

PQ-325

3 vu graphs.

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**

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<tr>
<td>AVCO</td>
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B-3
### CATEGORY 5

**Flight Projects and Planets**

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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
Maintenace
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
PQ Provisions
Planets
Policy
Post-Launch Analysis
Prediction
Pre-Launch Analysis
Proposal
Radiation
Rate of Consumption of P_c
Recontamination
Requirements
CATEGORY 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