

U. S. Navy Seafarer Program/ Project ELF Collection MS-037

Finding aid prepared by Elizabeth Russell, revised by Ryan Welle

This finding aid was produced using the Archivists' Toolkit

August 10, 2016

Describing Archives: A Content Standard

Michigan Technological University Archives and Copper Country Historical Collections

12/15/2010

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Summary Information

Repository	Michigan Technological University Archives and Copper Country Historical Collections
Title	U. S. Navy Seafarer Program/ Project ELF Collection
Date [inclusive]	1968-1997
Extent	17.35 cubic feet; 16 paige boxes and 3 manuscript boxes
Language	English
Mixed materials [Box]	1-19
Abstract	Collection, 1968-1997, of material relating to the Navy's Seafarer Program and Project ELF, compiled by the Michigan Technological University Archives and Copper Country Historical Collections in Houghton, Michigan.

Preferred Citation

MS-037, U. S. Navy Seafarer Program/ Project ELF Collection, Michigan Technological University Archives and Copper Country Historical Collections, Houghton, Michigan.

Historical Note

Extreme Low Frequency (ELF) radio signals are considered useful for one-way communication to submarines because they penetrate seawater to depths of several hundred feet. ELF is the only available system which, according to the US Navy, will allow continuous contact with submarines while they are at patrol depth and cruising speed. The history of ELF started with Sanguine which was to be a hardened system comprising over a hundred buried transmitters and 6,000 miles of underground cable covering 6,500 square miles in Michigan and Wisconsin. When that wasn't accepted the Navy proposed SEAFARER (Surface ELF Antenna For Addressing REMotely-deployed Receivers) with three above-ground transmitters and 2,400 miles of buried cable occupying 4,700 square miles. Then it was scaled down to Austere ELF with two surface transmitters and 158 miles of cable -- 130 miles of it buried along utility and roadway right-of-ways. The final incarnation was Project ELF, still with two transmitters and only 84 miles of cable hung on utility poles. In 2004 the US Navy ended Project ELF, citing improvements in communication technology that rendered ELF obsolete as well as the changing requirements of the modern Navy.

Collection Scope and Content Summary

Collection, 1968-1997, of material relating to the Navy's Seafarer Program and Project ELF, compiled by the Michigan Technological University Archives and Copper Country Historical Collections in Houghton, Michigan. Includes research reports, ecological and biological monitoring reports, Seafarer site surveys, ELF public hearing minutes, environmental impact statements, activist files, correspondence, maps, and other printed ephemera related to the implementation of and protest against the Seafarer Program and Project ELF.

Administrative Information

Publication Information

Michigan Technological University Archives and Copper Country Historical Collections 12/15/2010

Revision Description

Ryan Welle 8/2/2016

Access

Available for use in the Michigan Technological University Archives and Copper Country Historical Collections.

Conditions Governing Use

Various copying restrictions apply. Guidelines are available from Michigan Technological University Archives & Copper Country Historical Collections.

Acquisition

Material was donated to the Michigan Technological University Archives and Copper Country Historical Collections by Jorma Kalliokoski on February 16, 1988, Ruth Ann Ruehr on May 28, 1991 and August 5, 1991, William Veaser on February 19, 2003, Viola Brown on May 17, 2004, and Darren Patterson on September 27, 2013.

Controlled Access Headings

Corporate Name(s)

- ELF Communications Seafarer Program.
- GTE Sylvania Incorporated. Communications Systems Division.
- Project ELF.
- United States. Navy. Electronics Systems Command.

Genre(s)

- Audiocassettes
- Correspondence
- Maps (Documents)
- Minutes
- Reports
- Research (Document genres)
- Surveys (Documents)

Geographic Name(s)

- Clam Lake (Wis. : Lake)
- Republic (Mich.)

Personal Name(s)

- Brown, Viola
- Kalliokoski, Jorma
- Patterson, Darren
- Ruehr, Ruth Ann
- Veaser, William

Subject(s)

- Communications, Military
- ELF electromagnetic fields
- Project Seafarer
- Sanguine Project

Navy Ecological Monitoring Program

Collection Inventory

Navy Ecological Monitoring Program

Compilation of 1982 annual reports - Navy Ecological Monitoring Program May, 1983

	Box	Folder
Mixed materials	1	3

Compilation of 1983 annual reports - Navy Ecological Monitoring Program - Volume 1 July, 1984

	Box	Folder
Mixed materials	1	4

Compilation of 1983 annual reports - Navy Ecological Monitoring Program - Volume 2 July, 1984

	Box	Folder
Mixed materials	1	5

Compilation of 1984 annual reports - Navy Ecological Monitoring Program - Volume 1 June, 1985

	Box	Folder

Navy Ecological Monitoring Program

Mixed materials	1	6
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Compilation of 1984 annual reports - Navy Ecological Monitoring Program - Volume 2 June, 1985

	Box	Folder
Mixed materials	1	7

Compilation of 1985 annual reports - Navy Ecological Monitoring Program - Volume 1 July, 1986

	Box	Folder
Mixed materials	1	8

Compilation of 1985 annual reports - Navy Ecological Monitoring Program - Volume 2 July, 1986

	Box	Folder
Mixed materials	1	9

Compilation of 1985 annual reports - Navy Ecological Monitoring Program - Volume 3 July, 1986

	Box	Folder
Mixed materials	1	10

Compilation of 1986 annual reports - Navy Ecological Monitoring Program - Volume 1 July, 1987

Navy Ecological Monitoring Program

	Box	Folder
Mixed materials	2	1

Compilation of 1986 annual reports - Navy Ecological Monitoring Program - Volume 2 July, 1987

	Box	Folder
Mixed materials	2	2

Compilation of 1986 annual reports - Navy Ecological Monitoring Program - Volume 3 July, 1987

	Box	Folder
Mixed materials	2	3

Compilation of 1987 annual reports - Navy Ecological Monitoring Program - Volume 1 July, 1988

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Mixed materials	2	4

Compilation of 1987 annual reports - Navy Ecological Monitoring Program - Volume 2 July, 1988

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Mixed materials	2	5

Navy Ecological Monitoring Program

Compilation of 1987 annual reports - Navy Ecological Monitoring Program - Volume 3 July, 1988

	Box	Folder
Mixed materials	2	6

Compilation of 1988 annual reports - Navy Ecological Monitoring Program - Volume 1 August, 1989

	Box	Folder
Mixed materials	2	7

Compilation of 1988 annual reports - Navy Ecological Monitoring Program - Volume 2 August, 1989

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Mixed materials	2	8

Compilation of 1988 annual reports - Navy Ecological Monitoring Program - Volume 3 August, 1989

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Compilation of 1989 annual reports - Navy Ecological Monitoring Program - Volume 1 August, 1990

Navy Ecological Monitoring Program

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Compilation of 1989 annual reports - Navy Ecological Monitoring Program - Volume 2 August, 1990

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Compilation of 1989 annual reports - Navy Ecological Monitoring Program - Volume 3 August, 1990

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Compilation of 1990 annual reports - Navy Ecological Monitoring Program - Volume 1 August, 1991

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Compilation of 1990 annual reports - Navy Ecological Monitoring Program - Volume 2 August, 1991

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Navy Ecological Monitoring Program

Compilation of 1990 annual reports - Navy Ecological Monitoring Program - Volume 3 August, 1991

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Compilation of 1991 annual reports - Navy Ecological Monitoring Program - Volume 2 August, 1992

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Mixed materials	3	7

Compilation of 1991 annual reports - Navy Ecological Monitoring Program - Volume 3 August, 1992

	Box	Folder
Mixed materials	3	8

Compilation of 1993 annual reports - Navy Ecological Monitoring Program - Volume 1 April, 1994

Seafarer Site Survey

	Box	Folder
Mixed materials	3	9

Compilation of 1993 annual reports - Navy Ecological Monitoring Program - Volume 2 April, 1994

	Box	Folder
Mixed materials	3	10

Compilation of 1993 annual reports - Navy Ecological Monitoring Program - Volume 3 April, 1994

	Box	Folder
Mixed materials	4	1

Seafarer Site Survey

Seafarer Site Survey - Introduction April, 1976

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Mixed materials	4	2

Seafarer Site Survey - Socioeconomic Data April, 1976

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Seafarer Site Survey

Mixed materials	4	3
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Seafarer Site Survey - Governmental Data April, 1976

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Seafarer Site Survey - Land Ownership Data April, 1976

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Seafarer Site Survey - Land Use Data April, 1976

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Mixed materials	4	6

Seafarer Site Survey - Market Value Data April, 1976

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Mixed materials	4	7

Seafarer Site Survey - Transportation Data April, 1976

Seafarer Site Survey

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Seafarer Site Survey - Utilities Data April, 1976

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Mixed materials	4	9

Seafarer Site Survey - Mineral Extraction Data April, 1976

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Mixed materials	4	10

Seafarer Site Survey - Bedrock Geologic Data April, 1976

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Seafarer Site Survey - Surficial Geologic Data April, 1976

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Mixed materials	4	12

Seafarer Site Survey

Seafarer Site Survey - Slope and Terrain Data April, 1976

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Seafarer Site Survey - Soil Data April, 1976

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Mixed materials	4	14

Seafarer Site Survey - Surface Water Data April, 1976

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Seafarer Site Survey - Subsurface Water Data April, 1976

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Seafarer Site Survey - Climatic Data April, 1976

Seafarer Site Survey

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Seafarer Site Survey - Cultural and Recreation Data April, 1976

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Seafarer Site Survey - Vegetation Data April, 1976

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Mixed materials	4	19

Seafarer Site Survey - Wildlife Data April, 1976

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Mixed materials	4	20

Seafarer Site Survey - Air Quality and Noise Data April, 1976

	Box	Folder
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ELF System Ecological Monitoring Program

Seafarer Site Survey - Right-of-way opportunities and avoidance features April, 1976

	Box	Folder
Mixed materials	4	22

ELF System Ecological Monitoring Program

ELF system ecological monitoring program of 1982 progress August, 1983

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Mixed materials	4	28

ELF system ecological monitoring program of 1984 progress July, 1985

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Mixed materials	4	29

ELF system ecological monitoring program of 1985 progress October, 1986

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ELF System Ecological Monitoring Program

ELF system ecological monitoring program of 1986 progress December, 1987

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ELF system ecological monitoring program of 1988 progress November, 1989

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ELF system ecological monitoring program of 1987 progress April, 1989

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ELF system ecological monitoring program of 1989 progress November, 1990

	Box	Folder
Mixed materials	4	34

ELF system ecological monitoring program of 1990 progress December, 1991

ELF System Ecological Monitoring Program

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Mixed materials	4	35

ELF system ecological monitoring program - Summary Report 1982-91 Nov-92

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Mixed materials	4	36

1985 Annual Report of ELF Ecological Monitoring Program - Vol. 1 July, 1986

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Mixed materials	8	11

1985 Annual Report of ELF Ecological Monitoring Program - Vol. 2 July, 1986

	Box	Folder
Mixed materials	8	12

1983 Annual Reports - Navy ELF Ecological Monitoring Program - Vol. 1 July, 1984

	Box	Folder
Mixed materials	8	15

ELF Public Hearings

ELF Ecological Monitoring Program - Summary of 1984 Progress July, 1985

	Box	Folder
Mixed materials	8	17

ELF Public Hearings

ELF Public Hearings - Carson City, Nevada April, 1977

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Mixed materials	5	1

ELF Public Hearings - Escanaba, MI May, 1977

	Box	Folder
Mixed materials	5	2

ELF Public Hearings - Houghton, MI May, 1977

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Mixed materials	5	3

ELF Public Hearings

ELF Public Hearings - Lansing, MI May, 1977

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Mixed materials	5	4

ELF Public Hearings - Las Vegas, Nevada April, 1977

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Mixed materials	5	5

ELF Public Hearings - Marquette, MI May, 1977

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Mixed materials	5	6

ELF Public Hearings - Las Cruces, New Mexico April, 1977

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Mixed materials	5	7

ELF Public Hearings - Marquette, Houghton, Escanaba, Lansing MI Jun-77

ELF Site Survey Final Report

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Mixed materials	5	13

ELF Site Survey Final Report

ELF Site Survey Final Report - Michigan Region July, 1976

	Box	Folder
Mixed materials	5	8

ELF Site Survey Final Report - Michigan Region Antenna construction cost factors and installment plan July, 1976

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Mixed materials	5	9

ELF Site Survey Final Report - Michigan Region Earth Conductivity Data April, 1976

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Mixed materials	5	10

ELF Site Survey Final Report - Michigan Region K.I. Sawyer AFB support potential and operational interface April, 1976

Seafarer Draft Environmental Impact Statement

	Box	Folder
Mixed materials	5	11

Site Survey Final Report - Earth Conductivity Data April, 1976

	Box	Folder
Mixed materials	5	14

Seafarer Draft Environmental Impact Statement

Seafarer Draft Environmental Impact Statement February, 1977

	Box	Folder
Mixed materials	6	1

Seafarer Draft Environmental Impact Statement - Summary Statement February, 1977

	Box	Folder
Mixed materials	6	2

Seafarer Draft Environmental Impact Statement - Nevada Environmental Analysis February, 1977

	Box	Folder
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Seafarer Draft Environmental Impact Statement

Mixed materials	6	3
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Seafarer Draft Environmental Impact Statement - Michigan Environmental Analysis February, 1977

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Mixed materials	6	4

Seafarer Draft Environmental Impact Statement - Appendix A: Site-Independent Info February, 1977

	Box	Folder
Mixed materials	6	5

Seafarer Draft Environmental Impact Statement - Appendix B: Info for the Nevada area of interest February, 1977

	Box	Folder
Mixed materials	6	6

Seafarer Draft Environmental Impact Statement - Appendix C: Info for the New Mexico area of interest February, 1977

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Mixed materials	6	7

Seafarer Draft Environmental Impact Statement

Seafarer Draft Environmental Impact Statement - Appendix D: Info for the Michigan area of interest February, 1977

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Seafarer Draft Environmental Impact Statement - Illustrations and Tables February, 1977

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Seafarer Draft Environmental Impact Statement - Appendix E: Biological and Ecological Info February, 1977

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Mixed materials	6	10

Seafarer Draft Environmental Impact Statement - Appendix F: Public Interest February, 1977

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Seafarer Draft Environmental Impact Statement - Appendix G: Coordination February, 1977

Seafarer Draft Environmental Impact Statement

	Box	Folder
Mixed materials	6	12

Seafarer Draft Environmental Impact Statement - Supplement for experimental operations September, 1977

	Box	Folder
Mixed materials	6	13

Seafarer Draft Environmental Impact Statement - Summary statement and distribution list February, 1977

	Box	Folder
Mixed materials	6	14

Seafarer Draft Environmental Impact Statement - Environmental impacts in the Upper Peninsula of Michigan February, 1977

	Box	Folder
Mixed materials	6	15

Seafarer Draft Environmental Impact Statement - Environmental Impacts of the Nevada geographic region December, 1977

Seafarer Draft Environmental Impact Statement

	Box	Folder
Mixed materials	7	1

Seafarer Draft Environmental Impact Statement - Environmental Impacts of the New Mexico geographic alternative December, 1977

	Box	Folder
Mixed materials	7	2

Seafarer Draft Environmental Impact Statement - Public Interest December, 19778

	Box	Folder
Mixed materials	7	3

Seafarer Submarine Command and Control Communication System June, 1975

	Box	Folder
Mixed materials	5	16

Seafarer FBM Command and Control Communications May, 1972

	Box	Folder
Mixed materials	5	15

Sanguine System**Sanguine System**

Sanguine system for validation and full scale development technical annexes April, 1972

	Box	Folder
Mixed materials	7	4

Sanguine system fact sheet April, 1972

	Box	Folder
Mixed materials	7	5

Sanguine system for validation and full scale development April, 1972

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Mixed materials	7	6

Sanguine system final environmental impact statement for validation and full scale development April, 1972

	Box	Folder
Mixed materials	7	7

Miscellaneous Data

Supplement to the Sanguine System - Final Environmental impact statement February, 1975

	Box	Folder
Mixed materials	7	8

Summary of the Ad Hoc Panel on Sanguine May, 1972

	Box	Folder
Mixed materials	5	17

Project Sanguine - Michigan Site July, 1973

	Box	Folder
Mixed materials	8	14

Miscellaneous Data

Mineral extraction data February, 1974

	Box	Folder
Mixed materials	7	9

Miscellaneous Data

Land use data of upper Michigan region February, 1974

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Mixed materials	7	10

Land productivity data of upper Michigan region February, 1974

	Box	Folder
Mixed materials	7	11

Land ownership data of upper Michigan region February, 1974

	Box	Folder
Mixed materials	7	12

Intro to phase I of the site study for upper Michigan region February, 1974

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Mixed materials	7	13

Historical and Cultural Data of the western upper peninsula region February, 1974

Miscellaneous Data

	Box	Folder
Mixed materials	7	14

Governmental Data of the western upper peninsula region February, 1974

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Mixed materials	7	15

First order corridor avoidance areas of upper Michigan region February, 1974

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Mixed materials	7	16

Seafarer Corridor Analysis January, 1977

	Box	Folder
Mixed materials	7	17

Climatic Data of upper Michigan region February, 1974

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Mixed materials	7	18

Miscellaneous Data

Bedrock Geologic Data February, 1974

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Mixed materials	7	19

Bedrock Geologic Data February, 1974

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Mixed materials	7	20

Population and Demographic Data February, 1974

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Mixed materials	8	1

Soil Data February, 1974

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Mixed materials	8	2

Subsurface water data February, 1974

Miscellaneous Data

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Mixed materials	8	4

Soil Data February, 1974

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Mixed materials	8	3

Surface Geologic Data February, 1974

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Mixed materials	8	5

Surface Geologic Data February, 1974

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Mixed materials	8	6

Surface Water Data February, 1974

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Mixed materials	8	7

Miscellaneous Data

Transportation Data February, 1974

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Mixed materials	8	8

Vegetation Data February, 1974

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Mixed materials	8	9

Wildlife Data February, 1974

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Mixed materials	8	10

Susceptibility of cardiac pacemakers to ELF April, 1971

	Box	Folder
Mixed materials	8	13

FBM Command and Control Communications May, 1972

Miscellaneous Data

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Mixed materials	8	16

Biologic Effects of electric and magnetic fields 1977

	Box	Folder
Mixed materials	1	1

Comparison of environmental effects in MI & WI March, 1978

	Box	Folder
Mixed materials	1	2

Environmental Assessment - ELF facility September, 1983

	Box	Folder
Mixed materials	4	23

Data - Monkeys exposed to ELF radiation March, 1978

	Box	Folder
Mixed materials	4	24

Miscellaneous Data

Exposure of Primates to ELF November, 1977

	Box	Folder
Mixed materials	4	25

Exposure of Primates to ELF - copy 2 November, 1977

	Box	Folder
Mixed materials	4	26

ELF in Michigan and Wisconsin

	Box	Folder
Mixed materials	4	27

ELF Power distribution network data March, 1976

	Box	Folder
Mixed materials	5	12

Electromagnetic Field intensities - Clam Lake and Republic, MI January, 1984

Ruehr Files

	Box	Folder
Mixed materials	5	19

Electromagnetic Field intensities - Clam Lake February, 1983

	Box	Folder
Mixed materials	5	18

Ruehr Files

Environmental Assessment for Construction of ELF Michigan - Ruth A. Ruehr files September, 1983

	Box	Folder
Mixed materials	8	18

Draft Environmental Impact Statement - Ruth A. Ruehr files February, 1977

	Box	Folder
Mixed materials	8	19

ELF Biological and Ecological research summary - Ruth A. Ruehr files March, 1975

	Box	Folder
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Ruehr Files

Mixed materials	8	20
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ELF Biological and Ecological research summary (update) - Ruth A. Ruehr files February, 1977

	Box	Folder
Mixed materials	8	21

Unclassified version of a classified report entitled "The Navy's Strategic Communications Systems" - Ruth A. Ruehr files May-79

	Box	Folder
Mixed materials	8	22

Minutes of Public Info. Meetings at Marquette, Iron Mountain, Iron River - Ruth A. Ruehr files August, 1976

	Box	Folder
Mixed materials	8	23

Project Sanguine: The proposal and controversy in Wisconsin - Ruth A. Ruehr files November, 1975

	Box	Folder
Mixed materials	9	1

Ruehr Files

The ELF Odyssey: National security vs. environmental protection - Ruth A. Ruehr files 1980

	Box	Folder
Mixed materials	9	2

ELF Miscellaneous - Ruth A. Ruehr files

	Box	Folder
Mixed materials	9	3

Draft Environmental Impact Statement - Public Hearings, MI - Ruth A. Ruehr files April, May

	Box	Folder
Mixed materials	9	4

The Newsletter of Stop Project ELF - Ruth A. Ruehr files February; 1987

	Box	Folder
Mixed materials	9	5

ELF communications - A Perspective - Ruth A. Ruehr files

Ruehr Files

	Box	Folder
Mixed materials	9	6

Compilation of ELF Articles/Clippings - Ruth A. Ruehr files

	Box	Folder
Mixed materials	9	7

People Against Seafarer - Preliminary Critical Assessment - Ruth A. Ruehr files

	Box	Folder
Mixed materials	9	8

Compilation of ELF biomedical and ecological research Vol. 1 - Ruth A. Ruehr files February, 1975

	Box	Folder
Mixed materials	10	1

Compilation of ELF biomedical and ecological research Vol. 2 - Ruth A. Ruehr files February, 1975

	Box	Folder
Mixed materials	10	2

Ruehr Files

Compilation of ELF biomedical and ecological research Vol. 3 - Ruth A. Ruehr files January, 1977

	Box	Folder
Mixed materials	10	3

Compilation of ELF biomedical and ecological research Vol. 4 - Ruth A. Ruehr files

	Box	Folder
Mixed materials	10	4

ELF Background - Ruth A. Ruehr files

	Box	Folder
Mixed materials	12	1

History of ELF - Ruth A. Ruehr files

	Box	Folder
Mixed materials	12	2

How ELF started in Michigan - Ruth A. Ruehr files

Ruehr Files

	Box	Folder
Mixed materials	12	3

County Opinions - Ruth A. Ruehr files

	Box	Folder
Mixed materials	12	4

Seafarer Voting - Ruth A. Ruehr files

	Box	Folder
Mixed materials	12	5

ELF Surveys - Ruth A. Ruehr files

	Box	Folder
Mixed materials	12	6

Seafarer Voting - Ruth A. Ruehr files

	Box	Folder
Mixed materials	12	7

Ruehr Files

Letters from Carl Levin - Ruth A. Ruehr files 1981-83

	Box	Folder
Mixed materials	12	8

Bob Brown on ELF - Ruth A. Ruehr files

	Box	Folder
Mixed materials	12	9

Senator Gaylord on ELF - Ruth A. Ruehr files

	Box	Folder
Mixed materials	12	10

Senator Hart & Senator Riegle Material - Ruth A. Ruehr files

	Box	Folder
Mixed materials	12	11

Donald Riegle Info. - Ruth A. Ruehr files

Ruehr Files

	Box	Folder
Mixed materials	12	12

Ken Dorman - Ruth A. Ruehr files

	Box	Folder
Mixed materials	12	13

Professor VonZellen - Ruth A. Ruehr files

	Box	Folder
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Governor Milliken Material - Ruth A. Ruehr files 1977

	Box	Folder
Mixed materials	12	15

Representative Dominic Jacobetti & vote - Ruth A. Ruehr files 1976

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Mixed materials	12	16

Ruehr Files

Governor's letters & news releases - Ruth A. Ruehr files 1975-76

	Box	Folder
Mixed materials	12	17

Material from representative Phil Ruppe - Ruth A. Ruehr files 1975-78

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Mixed materials	12	18

Representative Ruppe's Poll - Ruth A. Ruehr files 1975

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Mixed materials	12	19

Letters form Eunice Carlson - Ruth A. Ruehr files

	Box	Folder
Mixed materials	12	20

Eunice Carlson Slander - Ruth A. Ruehr files

Ruehr Files

	Box	Folder
Mixed materials	12	21

State Legislature Material - Ruth A. Ruehr files 1975-81

	Box	Folder
Mixed materials	12	22

County Boards - Ruth A. Ruehr files 1976

	Box	Folder
Mixed materials	12	23

Public hearings on Seafarer - Ruth A. Ruehr files 1977

	Box	Folder
Mixed materials	12	24

Michigan Environmental Review Board (MERB) - Pass Statement - Ruth A. Ruehr files

	Box	Folder
Mixed materials	12	25

Ruehr Files

National Academy of Science - Ruth A. Ruehr files 1976

	Box	Folder
Mixed materials	12	29

Bio - Eco Research - Ruth A. Ruehr files 1974-76

	Box	Folder
Mixed materials	12	30

Project Sanguine Research - Ruth A. Ruehr files

	Box	Folder
Mixed materials	12	31

Physiology Research - Ruth A. Ruehr files

	Box	Folder
Mixed materials	12	33

Pick & Axe Articles + Miscellaneous material - Ruth A. Ruehr files

Ruehr Files

	Box	Folder
Mixed materials	12	36

Pick & Axe Articles + Miscellaneous material - Ruth A. Ruehr files

	Box	Folder
Mixed materials	12	37

Pick & Axe Articles + Miscellaneous material - Ruth A. Ruehr files

	Box	Folder
Mixed materials	13	1

Newspaper: Pick and Axe - Bessemer, MI October, 1975

	Box	Folder
Mixed materials	10	6

ELF Clippings - Daily Mining Gazette - Ruth A. Ruehr files 1975-81

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Mixed materials	13	2

Ruehr Files

ELF Clippings - Daily Mining Gazette - Ruth A. Ruehr files 1975-81

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Mixed materials	13	3

General ELF Clippings - Ruth A. Ruehr files

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General ELF Clippings - Ruth A. Ruehr files

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Mixed materials	13	5

ELF News Clippings - Ruth A. Ruehr files 1981-85

	Box	Folder
Mixed materials	13	6

Seafarer Clippings - Ruth A. Ruehr files 1975-81

Ruehr Files

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Mixed materials	13	7

ELF Related Topics - Ruth A. Ruehr files

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Mixed materials	13	8

Press Releases - Ruth A. Ruehr files 1975-76

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Mixed materials	13	9

PANAX - Ruth A. Ruehr files

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Mixed materials	13	11

New York Times Articles - Ruth A. Ruehr files 1969-75

	Box	Folder
Mixed materials	13	10

Ruehr Files

Sawyer Air Force Base - Ruth A. Ruehr files

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Mixed materials	13	12

Operation Action UP Documents and Clippings - Ruth A. Ruehr files 1978

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Mixed materials	13	13

Press Releases - Ruth A. Ruehr files 1975-80

	Box	Folder
Mixed materials	13	14

Various Letters - Ruth A. Ruehr files

	Box	Folder
Mixed materials	14	1

Seafarer Letters Received - Ruth A. Ruehr files 1975-77

Ruehr Files

	Box	Folder
Mixed materials	14	2

Seafarer Letters Received - Ruth A. Ruehr files

	Box	Folder
Mixed materials	14	2A

Seafarer Letters Received - Ruth A. Ruehr files 1977-79

	Box	Folder
Mixed materials	14	3

Seafarer Letters Received - Ruth A. Ruehr files 1978-81

	Box	Folder
Mixed materials	14	4

People Against Seafarer - Letters sent - Ruth A. Ruehr files 1975-76

	Box	Folder
Mixed materials	14	5

Ruehr Files

People Against Seafarer - Letters sent - Ruth A. Ruehr files 1977-79

	Box	Folder
Mixed materials	14	6

People Against Seafarer - Letters sent - Ruth A. Ruehr files 1978-81

	Box	Folder
Mixed materials	14	7

Pro Sanguine - Ruth A. Ruehr files

	Box	Folder
Mixed materials	14	8

Navy Response to People Against Sanguine - Ruth A. Ruehr files

	Box	Folder
Mixed materials	14	9

Finances - People Against Seafarer - Ruth A. Ruehr files 1973-81

Ruehr Files

	Box	Folder
Mixed materials	14	10

Finances - People Against Seafarer - Ruth A. Ruehr files

	Box	Folder
Mixed materials	14	10A

Friends of People Against Seafarer - Ruth A. Ruehr files 1975-78

	Box	Folder
Mixed materials	14	11

Fundraising - People Against Seafarer - Ruth A. Ruehr files 1976-77

	Box	Folder
Mixed materials	14	12

ELF Navy Documents and Memos - Ruth A. Ruehr files 1974-81

	Box	Folder
Mixed materials	14	13

Ruehr Files

Seafarer - League of Women Voters - Ruth A. Ruehr files 1974-78

	Box	Folder
Mixed materials	14	14

Seafarer Suppressed Report - Ruth A. Ruehr files

	Box	Folder
Mixed materials	14	15

ELF - Things to do - Ruth A. Ruehr files

	Box	Folder
Mixed materials	14	16

ELF Preliminary Statement - Ruth A. Ruehr files

	Box	Folder
Mixed materials	14	17

Science Advisor - National Organization for Women - Ruth A. Ruehr files

Ruehr Files

	Box	Folder
Mixed materials	14	18

NAS comment - Ruth A. Ruehr files

	Box	Folder
Mixed materials	14	19

ELF Wisconsin - Ruth A. Ruehr files 1970-79

	Box	Folder
Mixed materials	14	21

EIS comment - Ruth A. Ruehr files

	Box	Folder
Mixed materials	15	1

Misc. 2 - Ruth A. Ruehr files

	Box	Folder
Mixed materials	15	3

Ruehr Files

Misc. 3 - Ruth A. Ruehr files

	Box	Folder
Mixed materials	15	4

Misc. 4 - Ruth A. Ruehr files

	Box	Folder
Mixed materials	15	5

Misc. 5 - Ruth A. Ruehr files

	Box	Folder
Mixed materials	15	6

Misc. 6 - Ruth A. Ruehr files

	Box	Folder
Mixed materials	15	7

Misc. 7 - Ruth A. Ruehr files

Dorman Files

	Box	Folder
Mixed materials	15	8

Dorman Files

Collection of letters to Ken Dorman regarding ELF - Ken Dorman files

	Box	Folder
Mixed materials	9	9

Project Sanguine Briefing Meeting - Ken Dorman files January, 1974

	Box	Folder
Mixed materials	9	10

VFW on ELF - Ken Dorman files 1979

	Box	Folder
Mixed materials	9	11

Collection of letters regarding ELF - Ken Dorman files

	Box	Folder

Dorman Files

Mixed materials	9	12
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Biological and Human Health Effects on ELF - Ken Dorman files March, 1985

	Box	Folder
Mixed materials	9	13

Sanguine Telephone Interference Program - Ken Dorman files Sep-71

	Box	Folder
Mixed materials	9	14

Final Environmental Impact Statement - Ken Dorman files April, 1972

	Box	Folder
Mixed materials	9	15

ELF Ecological Monitoring Program - Wetland Studies - Ken Dorman files November, 1989

	Box	Folder
Mixed materials	9	16

ELF Ecological Monitoring Program - Slime Mold Studies - Ken Dorman files January, 1990

Dorman Files

	Box	Folder
Mixed materials	9	17

Congress Distribution List - Ken Dorman files

	Box	Folder
Mixed materials	9	18

Environmental Assessment for Terminal Groups Upgrade, Wisconsin - Ken Dorman files September, 1984

	Box	Folder
Mixed materials	9	19

ELF Communications - Questions and Answers - Ken Dorman files November, 1975

	Box	Folder
Mixed materials	9	20

Effect of ELF radiation on the pigeon and the rat - Ken Dorman files February, 1973

	Box	Folder
Mixed materials	9	21

Dorman Files

ELF Location Map - Ken Dorman files

	Box	Folder
Mixed materials	9	22

Technical memo #2, IITRI Project - Ken Dorman files October, 1972

	Box	Folder
Mixed materials	9	23

Household appliance magnetic field survey - Ken Dorman files March, 1984

	Box	Folder
Mixed materials	9	24

Summary of 1983 progress - Ecological Monitoring Program - Ken Dorman files July, 1984

	Box	Folder
Mixed materials	9	25

Testimonies: Health and Safety - Ken Dorman files

Dorman Files

	Box	Folder
Mixed materials	10	5

"Scientists Decry Seafarer Ethics" - Ken Dorman files

Collection of electrical utilities data for ELF Michigan - actual plan drawings - Ken Dorman files

	Box	Folder
Mixed materials	11	1

Collection of electrical utilities data for ELF Michigan - Published material - Ken Dorman files

	Box	Folder
Mixed materials	11	2

Project Sanguine Research - Ken Dorman files

	Box	Folder
Mixed materials	12	32

Press Releases - Ken Dorman files

	Box	Folder
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Dorman Files

Mixed materials	12	34
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Articles - Ken Dorman files

	Box	Folder
Mixed materials	12	35

Letters - Ken Dorman files

	Box	Folder
Mixed materials	13	15

Letters - Ken Dorman files

	Box	Folder
Mixed materials	13	16

ELF Pamphlets - Ken Dorman files

	Box	Folder
Mixed materials	14	20

Resolutions - Ken Dorman files

Kalliokoski Files

	Box	Folder
Mixed materials	14	22

Miscellaneous 1 - Ken Dorman files

	Box	Folder
Mixed materials	15	2

Misc. 10 - Ken Dorman files

	Box	Folder
Mixed materials	15	11

Misc. 11 - Ken Dorman files

	Box	Folder
Mixed materials	15	12

Kalliokoski Files

Mineral Exploration Data - Michigan Site - Kalliokoski files

	Box	Folder
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Kalliokoski Files

Mixed materials	11	3
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ELF Wisconsin - Non Navy Technical - Kalliokoski files

	Box	Folder
Mixed materials	11	4

ELF Wisconsin - New Items and popular articles - Kalliokoski files

	Box	Folder
Mixed materials	11	5

ELF Navy Reports - Kalliokoski files

	Box	Folder
Mixed materials	11	6

ELF Michigan - Kalliokoski files

	Box	Folder
Mixed materials	11	7

Misc. 8 - Kalliokoski files

Audiovisual Material

	Box	Folder
Mixed materials	15	9

Misc. 9 - Kalliokoski files

	Box	Folder
Mixed materials	15	10

Misc. 12 - Kalliokoski files

	Box	Folder
Mixed materials	15	13

Audiovisual Material

Audio Tape - Clayton + Hochko, Attorney General August 1977, October 1977

	Box	Folder
Mixed materials	11	8

Audio Tape - Donovan/Alexander WMPL Mar-77

	Box	Folder
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Audiovisual Material

Mixed materials	11	9
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Audio Tape - Project ELF Discussion WJNR May-79

	Box	Folder
Mixed materials	11	10

Audio Tape - Seafarer Debate Jan-79

	Box	Folder
Mixed materials	11	11

ELF Microfilm

	Box	Folder
Mixed materials	11	12

ELF Microfilm

	Box	Folder
Mixed materials	11	13

Audio Tape - Hoffman, Donovan March 1977, April 1977

Audiovisual Material

	Box	Folder
Mixed materials	11	14

Audio Tape - K. Becher / R. Dunnebacke / C. Kikuchi Aug-80

	Box	Folder
Mixed materials	11	15

Audio Tape - Milliken

	Box	Folder
Mixed materials	11	16

Audio Tape - Complete Ch.6 Donovan Mar-77

	Box	Folder
Mixed materials	11	17

Audio Tape - RA Seafarer Info. Feb-77

	Box	Folder
Mixed materials	11	18

Audiovisual Material

Audio Tape - Clements - Yerg Seafarer Houghton Hearing "Slander"

	Box	Folder
Mixed materials	11	19

Audio Tape - Joan PBB

	Box	Folder
Mixed materials	11	20

Audio Tape - ELF Mar-81

	Box	Folder
Mixed materials	11	21

Audio Tape - Seafarer Info. Elena Feb-77

	Box	Folder
Mixed materials	11	22

Audio Tape - Commissioners send Seafarer letter to Jacobetti

Audiovisual Material

	Box	Folder
Mixed materials	11	23

Audio Tape - WCCY - VFW May-80

	Box	Folder
Mixed materials	11	24

Audio Tape - ELF Monkeys

	Box	Folder
Mixed materials	11	25

Audio Tape - Admiral WMPL

	Box	Folder
Mixed materials	11	26

Audio Tape - OAP - Seafarer neutral

	Box	Folder
Mixed materials	11	27

Research Reports, Summaries

Audio Tape - New York Times Story May-77

	Box	Folder
Mixed materials	11	28

Audio Tape - Donovan - WHDF Mar-77

	Box	Folder
Mixed materials	11	29

Audio Tape - 60 Minutes - Seafarer

	Box	Folder
Mixed materials	11	30

Research Reports, Summaries

Michigan Environmental Review Board 1 1975-77

	Box	Folder
Mixed materials	12	26

Research Reports, Summaries

Michigan Environmental Review Board 2 1977-78

	Box	Folder
Mixed materials	12	27

Michigan Environmental Review Board 3 1975-76

	Box	Folder
Mixed materials	12	28

ELF Environmental Research Reports and Papers November, 1975

	Box	Folder
Mixed materials	15	14

Proceedings of the AD HOC Committee for the Review of Biomedical and Ecological Effects of ELF Radiation December, 1973

	Box	Folder
Mixed materials	15	15

ELF Interference Voltage Thresholds for Pipeline Systems October, 1972

Research Reports, Summaries

	Box	Folder
Mixed materials	15	16

Preliminary Engineering Guide for Power Distribution System Interference Mitigation November, 1972

	Box	Folder
Mixed materials	15	17

Single-Frequency Magnetotelluric Tensor Impedance Measurements in the Upper Peninsula, Michigan May, 1974

	Box	Folder
Mixed materials	15	18

The Lessons of Sanguine - A Case Study in ECO - Action June, 1971

	Box	Folder
Mixed materials	15	19

Navy ELF Biological and Ecological Research Summary May, 1976

	Box	Folder
Mixed materials	15	20

Brown Files

Brown Files

Residents Concerned About ELF

Exposure of Primates for One Year to Electric and Magnetic Fields Associated with ELF
Communication Systems Nov 1977

Seafarer ELF Communications System Final Environmental Impact Statement for Site Selection and
Test Operations: Summary Statement and Distribution List Dec 1977

Seafarer Communications System Final Environmental Impact Statement for Site Selection and Test
Operation: Public Interest Dec 1977

Illustrations and Tables

Seafarer ELF Communications System Final Impact Statement for Site Selection and Test Operations:
Environmental Impacts of the New Mexico Geographic Alternative Dec 1977

Seafarer ELF Communications System Final Environmental Impact Statement for Site Selection and
Test Operations: Environmental Impacts of the Nevada Geographic Alternative Dec 1977

Seafarer

ELF

Patterson Files

Seafarer

Seafarer

Seafarer

Seafarer

Seafarer

Seafarer

Seafarer

Patterson Files

ELF Grounds Review Meeting July 13, 1983

	Box	Folder
Mixed materials	17	1

ELF Grounds Review Meeting August 10, 1983

Patterson Files

	Box	Folder
Mixed materials	17	2

ELF Grounds Review Meeting September 14, 1983

	Box	Folder
Mixed materials	17	3

D.C. Resistivity Measurements Upper Peninsula, Michigan July 1, 1982

	Box	Folder
Mixed materials	17	4

Tensor Magnetotelluric Measurements of Earth Conductivity, Wisconsin and Michigan

	Box	Folder
Mixed materials	17	5

Tensor Magnetotelluric Measurements of Earth Conductivity, Upper Peninsula, Michigan July 1, 1982

	Box	Folder
Mixed materials	17	6

Patterson Files

Tensor Magnetotelluric Measurements at the Wisconsin Test Facility July 31, 1982

	Box	Folder
Mixed materials	17	7

ELF Communications Michigan Site Number 3 Ground Design Review June 14, 1983

	Box	Folder
Mixed materials	17	8

Failure Analysis West Test Ground - Clam Lake June, 1983

	Box	Folder
Mixed materials	17	9

Interim Chronology of Events at Well Site 2 (WB3) June 15, 1983

	Box	Folder
Mixed materials	18	1

Vertical Grounding Program - ELF Antenna: First Michigan Array 1, 2, &3 July 14, 1983

Patterson Files

	Box	Folder
Mixed materials	18	2

WTF Vertical Well Test Bed Evaluation August 26, 1983

	Box	Folder
Mixed materials	18	3

ELF Communications MTF/WTF Grounds Design Project Report (1 of 2) October 14, 1983

	Box	Folder
Mixed materials	18	4

ELF Communications MTF/WTF Grounds Design Project Report (2 of 2) October 14, 1983

	Box	Folder
Mixed materials	18	5

Description of and Procedures for Electrical Testing of MTF Ground Areas (Horizontal Wires and Vertical Wells) October 26, 1983

	Box	Folder
Mixed materials	18	6

Patterson Files

ELF Communications System Antenna Terminal Grounds Design Report March, 1984

	Box	Folder
Mixed materials	18	7

MTF Terminal Grounds Update Review February 27, 1985

	Box	Folder
Mixed materials	18	8

ELF Communications WTF Terminal Final Test Report December, 1985

	Box	Folder
Mixed materials	19	9

MTF Terminal Grounds Low Power Confidence Testing Final Report December, 1986

	Box	Folder
Mixed materials	18	10

Survey of Chequamegon National Forest 1968

Patterson Files

	Box	Folder
Mixed materials	19	1

Tables, Graphs, and Schematics of Survey Sites

	Box	Folder
Mixed materials	19	2

Tables, Graphs, and Schematics of of Survey Sites. Topographic Maps Included

	Box	Folder
Mixed materials	19	3

Geological Maps

	Box	Folder
Mixed materials	19	4

Geological Survey - Precambrian Rocks in Wisconsin 1970

	Box	Folder
Mixed materials	19	5

Patterson Files

County and National Forest Maps 1986

	Box	Folder
Mixed materials	19	6

Michigan Site Notes 1997

	Box	Folder
Mixed materials	19	7

SAIC Project Wisconsin Survey Site Notes 1997

	Box	Folder
Mixed materials	19	8

Micki Maki Field Books 1-3 1997

	Box	Folder
Mixed materials	19	9