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March 6, 1981

MAJ Alvin Young 520A Magnolia Maxwell AFB, Alabama 36113

Reference: VA Contract Number V101(93)P-823

JRB Project Number 2-816-03-744-00

Dear Al:

As I promised at our meeting yesterday, I am enclosing a copy of the report we provided to EPA following our review of the direct testimony and supporting documentation of Drs. Reggiani, Tuchmann-Duplessis, Crow, and Rowe at the 2,4,5-T/Silvex Cancellation Hearing. All documents listed in the six bibliographies should be available from EPA. Please note that some of these documents are confidential to the Italian Government.

We have some of the documents listed, particularly those in appendix 4. If you see anything of interest to you, you might want to try our files first.

If you have any questions or require further clarification, please call me on (703) 821-4644.

Sincerely,

JAB ASSOCIATES

A. Striegel, Ph.D.

Project Manager

JFS:jb

Enclosure

Al Young: Fyi -

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JRB ASSOCIATES, INC. 8400 WESTPARK DRIVE, McLEAN, VA 22102 (703) 821-4600 A Subsidiary of Science Applications, Inc.

JAMES F. STRIEGEL, Ph.D.

FINAL REPORT
Work Assignment No. 1
2,4,5-T Seveso Testimony Review

Provided to:

Ms. Jane Keller, M.P.H., Project Officer
Epidemiology Branch, OTS
U.S. Environmental Protection Agency

By:

JRB Associates, Inc. 8400 Westpark Drive McLean, Virginia 22102

November 14, 1980

Work Assignment No. 1 2,4,5-T Seves o Testimony Review

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EPA 68-01-6280 JRB 2-800-03-672-01

FINAL REPORT

Work Assignment No. 1:

2,4,5-T Seveso Testimony Review.

As the first task under contract number 68-01-6280, JRB was requested to assist the Office of General Counsel (OGC) in their preparation for the cross-examination of four witnesses testifying on behalf of the Dow Chemical Company, et al., during the cancellation hearing for major uses of the phenoxy acid herbicide, 2,4,5-T. A contaminant produced during the manufacture of 2,4,5-T is 2,4,7,8-tetrachlorodibenzo-p-dioxin (TCDD), one of the most highly toxic substances known.

Part of the case concerns the events that occurred at Sevese, Italy, after the ICMESA chemical plant (owned and operated by Hoffman-LaRoche) exploded in July 1976, resulting in a release of chemicals—including TCDD—over a densely populated area. Information regarding this event was provided in the direct testimony and supporting documentation of four witnesses for the Dow Chemical Company, et al. The majority of this information was covered by a confidentiality request by the Italian Governmentand was in Italian.

JRB's assignment was to provide a qualified epidemiologist to review the direct testimony and supporting documentation of the four witnesses, and to provide expert advice regarding EPA's cross—examinations.

Nature of Assignment

The four witnesses testifying on behalf of Dow Chemical Company, et al., included:

(1) Dr. Giuseppe Reggiani:

Member of the Research Board of Hoffman-LaRoche. As head of the Clinical Research Department at the time of the Seveso incident, Dr. Reggiani was sent to Seveso to determine the extent of danger and recommend to the Italian authorities any protective and preventive measures to be taken on behalf of the public.

(2) Dr. H. Tuchmann-Duplessis:

Professor of histology and embryology at the University of Paris, Director of the Basic Research Foundation of the Ministry of National Education, and head of the Department of Medical Biologists.

(3) Dr. V. K. Rowe:

Consultant to the Vice President for Health and Environmental Sciences at Dow Chemical Company, formerly Director of Toxicological Affairs for Dow Health and Environmental Sciences.

(4) Dr. Kenneth D. Crow:

Investigator for the English Medical Advisory Service, and recognized authority regarding chloracne. In 1976, Dr. Crow was requested by the Italian Government to provide advice about the possible toxicological effects of TCDD contamination following the incident at Seveso.

Mr. John O'Donnell of OGC was identified on the agency's Task Officer for this work assignment. Support was provided to the following members of designated OGC staff for their cross-examinations of witnesses:

Attorney

Witness to be Cross-Examined

Mr. John O'Donnell

Mr. Carl Bayer

Mr. Andrew Gordon

Dr. Richard Bozof

Dr. Giuseppe Reggiani

Dr. H. Tuchmann-Duplessis

Dr. V. K. Rowe

Dr. Kenneth Dr. Crow

Qualifications of JRB Specific to This Task Assignment

Under a separate contract with EPA, JRB is providing support for the determination of health effects and risks of exposure for a large variety of chemicals being manufactured in this country. Additionally, JRB has conducted a special investigation for EPA of the industrial production and disposal of chlorinated dioxins, a list of which is given in Table A.

1-chloro	1,2,3,4-tetrachloro	1,2,3,4,6-pentachloro
2-chloro	1,2,3,6-tetrachloro	1,2,3,4,7-pentachloro
1,2-dichloro	1,2,3,7-tetrachloro	1,2,3,6,7-pentachloro
1,3-dichloro	1,2,3,8-tetrachloro	1,2,3,6,8-pentachloro
1,4-dichloro	1,2,3,9-tetrachloro	1,2,3,6,9-pentachloro
1,6-dichloro	1,2,4,6-tetrachloro	1,2,3,7,8-pentachloro
1,7-dichloro	1,2,4,7-tetrachloro	1,2,3,7,9-pentachloro
1,8-dichloro	1,2,4,8-tetrachloro	1,2,3,8,9-pentachloro
1,9-dichloro	1,2,4,9-tetrachloro	1,2,4,6,7-pentachloro
2,3-dichloro	1,2,6,7-tetrachloro	1,2,4,6,8-pentachloro
2,7-dichloro	1,2,6,8-tetrachloro	1,2,4,6,9-pentachloro
2,8-dichloro	1,2,6,9-tetrachloro	1,2,4,6,9-pentachloro
1,2,3-trichloro	1,2,7,8-tetrachloro	1,2,4,7,9-pentachloro
1,2,4-trichloro	1,2,7,9-tetrachloro	1,2,4,8,9-pentachloro
1,2,6-trichloro	1,2,8,9-tetrachloro	1,2,3,4,6,7-hexachloro
1,2,7-trichloro	1,3,6,8-tetrachloro	1,2,3,4,6,8-hexachloro
1,2,8-trichloro	1,3,6,9-tetrachloro	1,2,3,4,6,9-hexachloro
1,2,9-trichloro	1,3,7,8-tetrachloro	1,2,3,4,7,8-hexachloro
1,3,6-trichloro	1,3,7,9-tetrachloro	1,2,3,6,7,8-hexachloro
1,3,7-trichloro	1,4,6,9-tetrachloro -	1,2,3,6,7,9-hexachloro
1,3,8-trichloro	1,4,7,8-tetrachloro	1,2,3,6,8,9-hexachloro
1,3,9-trichloro	2,3,7,8-tetrachloro	1,2,3,7,8,9-hexachloro
1,4,6-trichloro		1,2,4,6,7,9-hexachloro
1,4,7-trichloro		1,2,4,6,8,9-hexachloro
2,3,6-trichloro		1,2,3,4,6,7,8-heptachloro
2,3,7-trichloro		1,2,3,4,6,7,9-heptachloro
		Octachloro

TABLE A: CHLORINATED DIOXINS RESEARCHED BY JRB

Due to the technical nature of the testimonies provided by these witnesses, and the short time period permitted for response, a dedicated staff of four persons was selected for this task. These include:

Dr. Jim Striegel: Task Manager

Dr. Leslie Eminton: Senior Scientist

Ms. Alice Hastings: Document Control Specialist

and Research Analyst

Ms. Marie Murray: Research Analyst

In addition, JRB obtained the services of the Literature Research Company to provide English summaries, abstracts, and translations of Italian language documents provided by the four witnesses for Dow.

Schedule of Work

October 29: JRB was notified by the Project Officer that this task would be initiated and would involve rapid response support to the Office of General Council. We immediately contacted the contract specialist and the designated Task

Officer, Mr. O'Donnell, to notify them of our readiness and to establish the initial schedule.

October 31: Dr. Striegel met with Mr. O'Donnell and was briefed on

the requirements of the assignment. Written testimony of the four witnesses and supporting documentation was received from OGC. The documentation consisted of more than 130 items and reports compiled
from Italian Government files concerning the incident
at Seveso, and subsequent investigations and public
health programs. Almost all of this documentation
was in Italian and all of it was covered by an Italian Government request for confidentiality. A list
of these documents is provided on appendix 1. In
addition, another 187 articles from technical journals
and the pepular press were provided, many of which were
written in Italian, German, and French. A list of

these articles is provided as appendix 2.

November 3: The JRB task team was assembled and began work on the testimony and document files. Articles specifically referenced in the testimony of the witnesses were marked. Any references cited by the witnesses, but not included in the supporting documentations, were identified. These missing references are listed in appendix 3.

- November 4: Review of the direct testimony of Drs. Reggiani and Tuchmann-Duplessis and documentation continued. The confidential material from Italian Government files was reviewed to select specific reports to submit to the translator for abstracting. Dr. Fuinton independently reviewed the English translation of the bibliography of the Italian Government files (shown in appendix 1), and selected documents for the translator to abstract. Documents sent to the Literature Research Company for summarization and abstracting are listed in appendix 4.
- November 5: Review of the documentation continued. At the suggestion of Mr. O'Donnell, computer search was conducted by JRB to identify publications by the witness, Dr. Reggiani, which pertain to the incident at Seveso but had not been provided in the supporting documentation. These publications are also listed in appendix 3.
- November 6: Dr. Striegel and Dr. Euinton attended initial strategy meeting with Messrs. O'Donnell, Bayer, Gordon and Bozof of OGC. Dr. Euinton provided advice on legal approaches to the cross-examinations of Dr. Reggiani and Dr. Tuchmann-Duplessis, and initial advice regarding the cross-examinations of Dr. Rowe and Dr. Crow.
- November 7: JRB delivered two copies of all supporting documents required for disclosure pertaining to the direct testimony of Dr. Reggiani and Tuchmann-Duplessis. Dr. Striegel and Dr. Euinton also met with Mr. Gordon and Dr. Bozof to discuss strategies for the cross-examinations of Drs. Rowe and Crow. Dr. Bozof provided another 23 documents used as references by Dr. Crow, and requested that JRB review these during the coming week. These documents are listed in appendix 5. Mr. O'Donnell, the Task Officer, verified the need for this additional work. Dr. Euinton also provided further advice regarding the cross-examinations of Dr. Reggiani and Dr. Tuchmann-Duplessis.
- November 10: Dr. Euinton attended the initial hearing session where Dr. Reggiani read his testimony and the cross-examination began. JRB received from Dr. Bozof a list of items that he wanted found, copied, and delivered to him the next day. A trip was made to the National Library to get these documents.
- November 11: A trip was made to George Washington University Himmelfarb Health Sciences Library to complete the set of documents being provided to Dr. Bozof. At the time of delivery, Dr. Bozof requested two more items and a second trip was made to the Himmelfarb Library, but the material requested was not available. Dr. Bozof then withdrew his request. The materials obtained and provided to Dr. Bozof are listed in appendix 6.

November 12: Dr. Eulnton spoke by telephone with Dr. Bozof to provide final information and advice regarding the cross-examination of Dr. Crow.

November 13: A final report of all task activities was drafted and prepared for submission to the EPA.

November 14: The final report of the task was submitted to the Project Officer, Ms. Keller, the Task Officer, Mr. O'Donnell, and the Contracting Officer, Mr. Kranda.

Control Procedures for Document Security

At the time that confidential documents were transmitted to Dr. Striegel, he also received forms to be read and signed by each of the persons involved in the review of these documents, indicating their acknowledgment of the confidentiality of this material. Signed agreements of confidentiality from all persons handling the restricted documents were submitted to Mr. O'Donnell on November 6. Persons using these documents include: Dr. Striegel, Dr. Euinton, Ms. Hastings, and Ms. Sara Lee Schnur, the translat@r.

At the end of each working day, these materials were reassembled, boxed, and placed in a locked security area. The use of these documents for photocopying has been restricted, permitting copies of only those materials selected as a basis for the cross-examination of witnesses. Four copies of these selected materials were made, and dissemination of them is as follows: two copies delivered to Mr. O'Donnell on November 7, one copy to Dr. Euinton for research, and one copy to the task files for backup and for use in compiling the final report. All documents sent to and used by the translator have been returned to JRB.

All confidential documents associated with this task have been carefully controlled and handled in accordance with security procedures.

Original document files were returned to Mr. O'Donnell on November 14, and all remaining copies at JRB have been destroyed.

APPENDIX 1:

ENGLISH-LANGUAGE LISTING

OF CONFIDENTIAL DOCUMENTS SUPPORTING
THE TESTIMONY OF DRS. REGGIANI AND
TUCHMANN-DUPLESSIS, AND PROVIDED BY
DOW CHEMICAL COMPANY*

^{*}About 90 percent of these documents are in Italian. All are covered by a confidentiality request from the Italian Government.

- 2 A: Reports by Italian Authorities of the Lombardy Region 1976
- Chronology of the Icmesa accident Report on my visit to Milan and to the City Hall of Seveso July 23, 1976
- Coordinating Committee on Public Health and Sanitation Standards following the Icmesa accident August 18, 1976
 - Description of TCDD
 - Problems of sanitation caused by dioxin
 - Virulence and characteristics of dioxin toxicity
 - Effect of dioxin toxicity on various organs and body systems
 - Particularities of the dioxin which escaped from Icmesa
 - Evaluation of the risk that dioxin (TCDD) represents in cases of pregnancy - Milan 8/9/76
 - Surveillance plan
 - Plan for the operational rehabilitation program required under Art. 1, para. A, Regional Law 2, January 17, 1977, and provisions for implementing the rehabilitation plan approved by the R. C. on 7/10/76
 - Conference of experts on the problems raised by dioxin pollution "Rehabilitation of the areas covered by the districts of Seveso, Meda, Cesano Maderno and Desio that have been contaminated by dioxin"
 - Rehabilitation program for the areas covered by the districts of Seveso and Meda that have been contaminated by dioxin
- Rehabilitation of the areas of Seveso and of the districts bordering on it which have been contaminated by dioxin Coordination and development of the program approved by the Regional Council on August 24, 1976 Report by Prof. A. Giovanardi December 4, 1976
- Medico-Epidemiological Commission (Coordinator Prof. G. M. Fara) Milan, August 27, 1976
- Lombardy Region Office of the Public Health Assessor Medico-Epidemiological Commission Milan, September 27, 1976
- New survey of Zone "B" Directed by the Commission of Inquiry 9/6/76
- 7. Regional Council of Lombardy, 3rd Advisory Commission:
 Sanitation and Hospital Services Social Security Ecology Environmental Protection
 "Report by the 3rd Advisory Commission on conditions in
 the Seveso area affected by pollution due to toxic
 substances, and on the appropriate measures that must be
 taken"
 Carrera, 10/7/76

- 8. Lombardy Region, November 10, 1976 "Updating of the data relating to the actions taken by Public Health for the population of the area affected by dioxin pollution"
- 9. Lombardy Region Regional Law 2, January 17, 1977 "Operations for the population of the area affected by TCDD pollution"
- 10. Minutes of the meeting of the working group on the results of embryo-morphological studies in cases of abortion connected with the Seveso accident of July 10, 1976, held in Lübeck, February 24 - 25, 1977
- 11. Lombardy Region Office of the Public Health Assessor Outline of the operational program in the matter of sanitary assessments and controls, sanitary assistance and the protection of Public Health. Regional Law 2, January 17, 1977 Milan, March 28, 1977
- 12. Dermatology Clinic, Milan University, April 1, 1977
- 13. Commission of the European Communities Document No. V/F/1/2669/1/77.f Draft Report First meeting of the Chloracne Panel, Milan, July 11-12, 1977
- 14. Commission of the European Communities
 Document No. 1320/77 e
 Chloracne Panel, Milan 11 & 12 July, 1977
 Working paper prepared by Prof. Vittorio Puccinelli,
 Dermatology Clinic, Milan
- 15. Preliminary report on the state of health in the area polluted by TCDD (Report submitted by Prof. G. Fara, President of the Medico-epidemiological Commission, to the Seveso Conference on 5/28/77)
- 16. Documentation File No. 1, comprising:
 a summary approved by the Coordinating Committee
 the report on the state of health
 various documents related to specific problems
- 17. Operations in Zone R after July 1, 1977
- 18. Resurvey of Zones Al, A2, A3, A4

Lombardy Region
 Medico-epidemiological Commission
 Preliminary report on the state of health in the area of
 Seveso
 (Report submitted to the Seveso Conference)
 May 28, 1977
 Computer printouts

- 2. Cytogenic studies in individuals exposed to the toxic effect of TCDD carried out within the framework of the agreements between the Lombardy Region and the Institutes of General Biology of the Schools of Medicine and Surgery of the Universities of Milan and of Pavia
- 3. Extract from the report on the results of the chromosomal studies of cells from women exposed to TCDD (Project of the Professors de Carli and Candiani) (Chromosome studies on pregnant women) (Personal communication)
- Galley proof, detailed report on the activities related to the matter of sanitary operations in the area polluted by TCDD and on an evaluation of these operations Milan, June 21, 1977

Galley proof, detailed report on the activities related to the matter of sanitary operations in the area polluted by TCDD and on an evaluation of these operations Enclosures Milan, June 21, 1977

- Lombardy Region Veterinary Service September 1977
 Report on the sanitary situation and on breeding conditions
 for cattle in the affected area
- Lombardy Region November 25, 1977
 Past and recent case histories from the husbandry station of the Archdiocesan Seminary of Seveso
- Liver function tests
 District of Polo (Meda) District of San Pietro (Seveso)
 Zone B sample of 546 people both sexes

- 2 C: Reports by the Special Commission on the Seveso Accident July 2-3, 1978 Follow-up on health surveillance - September 1978
- Program for the "Press Seminary" of July 2-3, 1978
 - Lombardy Region, Special Office for Seveso
 July 76 July 78 "Analysis and evaluation of the consequences of the pollution by TCDD and of the policies regarding public operations two years after the ICMESA incident"
 PRESS SEMINARY
 - Organization of sanitary operations in the area affected by TCDD contamination following the ICMESA incident of 7/10/76
 - Progress report on the epidemiological studies and on programming for new investigations
 B. Paccgnalla, L. Dardanoni
 - Neonatology and pediatrics
 - Findings of the "Cytogenic studies in individuals exposed to the toxic action of TCDD"
 - Summary of the reports by Professors L. Giannico and E.M. Colombrini of the Directorate General of the Public Health Services of the Ministry of Health concerning "Operations of the Ministry of Health in connection with the TCDD pollution" Seminary with the Press, Milan, July 2-3, 1978.
 - Evaluation of the consequences of the TCDD pollution from a veterinary viewpoint
 - Lombardy Region, "Evaluation of the consequences of the TCDD pollution from a veterinary viewpoint"
 - Cultivation in the contaminated area
 - Agronomy and agrotechny aspects of the rehabilitation operations in the area of Seveso
 A. Gervato - G. Zampieri
 - Legal aspects of the ICMESA incident, a synthesis for the press. Speaker: Attorney Mario Bertacco.
 - Map of the deposit monitors
 - Network of wells for the aqueduct under periodic observation in order to control underground water
 - Surface water
 - Structural foundations
- 2. Follow-up on the health survey scope and operational plans

2 D: Reports by the Medical Commission 1979

- Lombardy Region
 Operational Program No. 2
 "Medical observations relating to subjects suffering from dermatological symptoms exposed to risks as a result of the TCDD pollution in the areas of the C.S.Z.'s Brianza di Seveso 1, 2, 3."
 Report No. 5, November 1978
- Groups of individuals with dermal lesions, ages 1 to 14 as of 7/10/76
- Lombardy Region
 Operational Program No.2
 "Development of spontaneous abortions in the area of the
 C.S.Z.'s Brianza di Seveso 1, 2, 3"
 Report No. 7, December 1978 (galley proof)
- Lombardy Region
 "Press Conference of July 5, 1979"
 Introduction by Attorney Antonio Spallino
- 5. Lombardy Region Operational Program No. 2 "Development of spontaneous abortions in the area of the C.S.Z.'s Brianza di Seveso 1. 2, 3"
- 6. Lombardy Region Del Corno, G., Favaretti, C., Caramaschi, F., Giambelluca, S.E., Montesarchio, E., Bonetti, F., Volpato, C. "Distribution of chloracne cases in the area of Seveso as a result of TCDD pollution (2,3,7,8-tetrachloro-dibenzo-pdioxin).
- 7. Lombardy Region "Chloracne and general clinical symptoms in a group of subjects more than 14-years-old, exposed to TCDD in the area of Seveso"
- Lombardy Region
 Favaretti, C., Del Corno, G., Caramaschi, F., Giambelluca, S.E.,
 Montesarchio, E., Marni, E., Bonetti, F., Volpato, C.
 "Chloracne and general clinical symptoms in a group of
 subjects, aged 0 to 14 years, exposed to TCDD in the area of
 Seveso"
- European Teratology Society, 6th Conference, September 4 - 7, 1978 in Budapest, Hungary "Experience of the accident of Seveso"

- 2 E: Health Surveillance Program Follow-up reports, September 1979 - May 1980
- Lombardy Region
 Operational Program No. 2
 Progress report as of March 31, 1979
 (July 1979)
- Control of the group of individuals with porphyrinuria above 100 mog/e in 1976
- Total sampling by the Laboratory of the Desio Hospital as of 3/31/79
- 4. Report on the exploratory dissection of 3/31/79
- 1st galley proof, report by Dr. Marni on deformities Seveso, September 1979
- Lombardy Region Offices of the P.O. 2 FB/ag Prot. No. 162
 "Minutes of the 17th meeting of the Epidemiological Commission established by decree of the President of the Lombardy Region, No. 32 of 1/19/78."
- 7. Report by Prof. Puccinelli on dermal lesions, July 5, 1979
- Live births and stillbirths, natimortality rate in the districts of the 3 C.S.Z.'s Brianza di Seveso 1, 2, 3, Milan Province, Lombardy, Italy.
- Milan University, July 1979
 "Comments on the reports on the neurological activities at the Occupational Clinic, Milan University"
- 10. Mortality studies in the three C.S.Z.'s "Brianza di Seveso" Preliminary findings - L. Santi 7/9/80
- Second Meeting of the International Committee of Guarantors, Como, Italy, November 26 - 27, 1979
- Second Meeting of the International Committee of Guarantors, Como, Italy, November 26 - 27, 1979
- 3rd Meeting of the International Scientific Steering Committee, March 30 - April 1, 1980, Milan, Italy

- Official Bulletin of the Lombardy Region No. 52, December 27, 1979
- 15. "La Traccia" Information journal of the Italian Society for Mass Spectrometry in Biochemistry and Medicine March - April, 1980, 3rd year, No. 2
- Updated data on mortality in the area of Seveso, Milan, 7/9/80
- 17. Minutes of the meeting of 3/14/80 of the Regional Technical Advisory Commission for the determination of the threshold of toleration for TCDD in the environment and in food.
- Ministry of Health Reporting Commission, Meeting No. 54/R Rome, May 2, 1980 - 10 a.m.
- Ministry of Health Plenary Commission, Meeting No. 54 Rome, May 2, 1980 - 3 p.m.
- 20 Ministry of Health Plenary Commission, Meeting No. 55 Rome, May 27, 1980 - 11 a.m.
- Ministry of Health Plenary Commission, Meeting No. 56 Rome, May 29, 1980 - 4 p.m.
- 22. Ministry of Health Plenary Commission, Meeting No. 53 Rome, April 24, 1980 - 10 a.m.
- Ministry of Health Reporting Commission, Meeting No. 53/R Rome, April 23, 1980 - 4 p.m.
- 24. Ministry of Health. Reporting Commission, Rome, April 23, 1980 "Examination of the state of health of the population affected by TCDD pollution"
- Ministry of Health Reporting Commission, Meeting No. 52/R Rome, March 31, 1980 - 10 a.m.
- Ministry of Health Plenary Commission, Meeting No. 52 Rome, March 31, 1980 - 3 p.m.

- 27. Ministry of Health Reporting Commission, Rome, March 31, 1980 "Proposal to liberalize cultivation in Zones "R" and "B"
- 28. Telex of February 15, 1980
 "Corriere della Sera" dated 2/15/80
 "Another 10 scientists named to the 'Dioxin Commission'"
- 29. Ministry of Health
 Special Technical-scientific Commission for the decontamination of Seveso established by D.P.C.M. of 8/4/76 and subsequent amendments
 Minutes of Meeting No. 48, Rome, August 3, 1979
- 30. Ministry of Health
 Special Technical-scientific Commission for the decontamination of Seveso established by D.P.C.M. of 8/4/76 and subsequent amendments
 Minutes of Meeting No. 46, Rome, June 23, 1979
- 31. Ministry of Health
 Special Technical-scientific Commission established by
 D.P.C.M. of 8/4/76 and subsequent amendments
 Minutes of Meeting No. 45, Rome, May 30, 1979

4: Reports by medical experts on cases of injury selected by the judge in charge of the judicial investigation -8 volumes

Vol. 1

Investigation reports on the 22 cases designated by the judge charged with the inquiry on the causes of injury and on their extent and their consequences in connection with the Seveso accident

Vol. 2

Laboratory tests for the detection of damage to specific metabolic functions of organs (liver, kidney) or of altered serum composition, of blood morphology, etc. carried out between July 1976 and October 1977

BODONI, Rosa Angela BRAGATO, Moreno BRUNO, Farida CANESSO, Maria in TESSAROLO CARPEZZA, Claudio CASSIO, Elda CASSIO, Paola CONTE, Corrado CONTE, Emanuela CONTE, Katia CONTE, Massimo GALLETTA, Rita GASBARRI, Luciano PORELLI, Katia RIZZARDI, Severino SANAVIO, Iolanda SANTORO, Antonio SARTOR, Maurizio SENNO, Alice SENNO, Stefania SUSIGAN, Mara VARCASIA, Annunziata

Vol. 3

Clinical history and findings of the experts in the examinations which took place March 27 and October 18, 1977

Vol. 4

Laboratory tests (ESR blood count, GOT, GPT, GT, etc, total protein, etc.) carried out during the examinations by the experts.

Vol. 5

Count of chromosome aberrations and test for immunodeficiency in the lymphocytes for each case.

Report on the cytogenic studies carried out as part of the survey ordered by the examining magistrate of the Tribunal of Monza in connection with the accident that occured on 7/10/76 at the Icmesa plant in Meda.

Vol. 6

General considerations on the question of causality with respect to TCDD. Claims of exposure merely assessed historically. Clinical symptoms unspecific except for chloracne. No detection of TCDD. Forensic medical evaluation of each case. Conclusions.

Vol. 7

Documents and communications from the experts:

- Letter to Ministry of Health, Rome September 1977. Request for data.
- 2) Letter of December 15, 1977 to examining magistrate Number of chloracne cases: 130
- Letter to Spallino, February 16, 1979
 Request for data, July 76 to February 78.
- 4) Reports on cytogenic studies.

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Case of major abdominal malformation. Atrophy or absence of rectum abdominies with exstrophy of gastrointestinal organs.

- 4: Reports by medical experts on cases of injury selected by the judge in charge of the judicial investigation
- Report on the case of Mrs. Genoveffa Turchetto in Senno Prof. Ezio Ventura, Modena Modena, April 2, 1977
- Comments on the investigations carried out so far
- Results of the bioptic study made of Genoveffa Turchetto in Senno (samples taken during the surgery of 12/7/76)
- Report of medical forensic investigation of the causes of the death of Turchetto Senno Genoveffa Prof. Fornari, Montagna, Facchetti
- Report of medical forensic investigation of the causes of the death of Turchetto Senno Genoveffa Clinical file Analytical outline

Contracting the Contracting of

- 4. Reports by medical experts on cases of injury selected by the judge in charge of the judicial investigation
- Tribunal of Monza
 Examining Office Examining Couns.: Dr. C. Di Nunzio
 Crim. Proc. No. 199/76
 Report of forensic medical investigation into the causes
 and circumstances of the death of: TEOFILO, Lucia
- Report on forensic medical investigation into the causes of the death of : MARCHETTI, Antonio
- Report on joint forensic medical investigation into the causes of the death of: POLICELLA, Michelangelo
- TRIBUNAL OF MONZA EXAMINING OFFICE Crim. Proc. No. 199/76 Examining Couns. Dr. Cesare Di Nunzio
- Report of joint medical and chemical-toxicological investigation into the death of PERATELLO ALINO
- Chemical-toxicological investigation in connection with the criminal procedure in the death of MARCHETTI ANTONIO
- Chemical-toxicological investigation in connection with the criminal procedure in the death of TEOFILO LUCIA

- 4: Reports by medical experts on cases of injury selected by the judge in charge of the judicial investigation
- Medical report on the examination of the children Alice and Stefania Senno in Meda near Milan Prof. K.H. Schulz M.D., Hamburg 2/20/78

Medical report on the examination of the children Alice and Stefania Senno in Meda near Milan Prof. K.H. Schulz M.D., Hamburg 6/11/79

- Findings by Prof Ugo, 7/28/77
- Report on the examinations by Professors R. Ugo and G. Caglio Criminal proceedings 199/76 R.G. Tribunal of Monza Examining magistrate Dr. Rosini Situation in October November 1977
- Report of forensic medical investigation into the causes of the death of Di Domenicantonio Vito
- Report of joint medical investigation into the causes and circumstances of the death of Familiari Antonia

APPENDIX 2:

LISTING OF NONCONFIDENTIAL DOCUMENTS
SUPPORTING THE TESTIMONY OF
DRS. REGGIANI AND TUCHMANN-DUPLESSIS
AND PROVIDED BY DOW CHEMICAL COMPANY

JRB Associates, Inc.

1. Publications related to the Seveso accident

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 Cantoni, L., Castelli, M.G., Cerletti, C., Chiabrando, C.,

 Coccia, P., Colturani, F., Facchinetti, T., Fanelli, R.,

 Frigerio, A., Gerna, M., Lanzoni, J., Latini, R., Manara, L.,

 Martelli, G., Negrini, P., Pantarotto, C., Recchia, M.,

 Riva, E., Rossi, E., Salmona, M., Sironi, M., Szumilo, T.,

 Vecchi, A., Zanol, M.: Identification and quantitative

 determination of 2,3,7,8-Tetrachlorodibenzo-para-Dioxin
 in animals from contaminated areas. (4th International
 Symposium on Mass Spectrometry in Biochemistry and
 Medicine, Riva del Garda, Italy, June 20-22, 1977)
- 2) Allegrini, I., Bertoni, G., Brocco, D., Liberti, A.,

 Possanzini, M.: Decontaminazione mediante radiazioni ultraviolette da inquinamento da 2,3,7,8-tetraclorodibenzodiossina.
 (La Chimica e L'Industria 59: No 8, 541-544, 1977)

- 4) Bastenier, H.: La Catastrophe de Seveso. (Bruxelles-Médical 58: No 1, 3-12, 1978)
- 5) Beale, M.G., Shearer, W.T., Karl, M.M., Robson, A.M.:
 Long-term effects of dioxin explosure. (Lancet, No 8014, p. 748, April 2, 1977)
- 6) Berrino, F.: L'esposizione dell'uomo alla diossina prima di Seveso. (Epidemiologia e Prevenzione No 1, 64-67, 1977)
- 7) Berrino, F.: Preliminary report on mortality in the Seveso area, 1975-77.
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- 8) Bresson, G.: La peste chimique de Seveso a déjà sevi en 1963 aux Pays-Bas chez Philips.

- 9) Cassitto, L., Magnani, P.: Un metodo di controllo degli effluenti del previsto impianto di incenerimento di Seveso mediante gascromatografia frammentografia di massa. (Inquinamento 33: No 5, 33-38, 1977)
- 10) Cattabeni, F.: The analysis of TCDD in the Seveso area (Symposium on Chlorinated Phenoxy Acids and their Dioxins; Mode of Action, Health Risks and Environmental Effects. The Royal Swedish Academy of Sciences. Stockholm, February 7-9, 1977)
- 11) Cattabeni, F.: Environmental monitoring of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin by mass fragmentography: The Seveso case. (4th International Symposium on Mass Spectrometry in Biochemistry and Medicine, Riva del Garda, Italy 20-22 June 1977)
- 12) Cooper, P.: Dioxin: A new biological probe? (Food Cosmet Tox 15: No 5, 481-483, 1977)
- 13) Crow, K.D.: Effects of Dioxin exposure.
 (The Lancet, pp 82-83, July 9, 1977)
- 14) Crow, K.D.: Chloracne: the chemical disease.
 (New Scientist, pp. 78-80, 13 April 1978)
- 15) Dewse, C.D.: Danger of TCDD. (Lancet, 363, August 14, 1976)
- 16) Dioguardi: Effetti tossici della diossina. (Associazione Italiana per lo studio del fegato, Roma l'11 e 12 dicembre 1976). Deutsche Uebersetzung: Giftige Auswirkungen des Dioxins. (Italienische Vereinigung zum Studium der Leber, Rom, 11./12.12.76)
- 17) Editorial: Health hazard of dioxins still uncertain. (C & EN p. 12, April 16, 1973)
- 18) Editorial: Seveso the accident that should never have happened. (New Scientist, 267, August 5, 1976)
- 19) Editorial: Seveso. (Lancet, 297, August 7, 1976) -
- 20) <u>Editorial:</u> Industrial chloracne: A conspiracy of silence? (New Scientist, 371, August 19, 1976)

- 21) Editorial: A propos de Seveso ... (Laboratoire Coopératif No 112, 46-48, janvier-février 1977)
- 22) Editorial: Slow Decomposition of the Seveso toxin (Svensk Farmaceutisk Tidskrift. (The Swedish Pharmaceutical Periodical) 81: No 1, 1977)
- 23) Editorial: Twelve months after Seveso. (Nature-268: No 5616, 90, 1977)
- 24) Editorial: Decisione e continuità. (Negri News 11: No 1, 6, 1977)
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- 26) Editorial: Spread of Dioxin. (The Lancet II, No 8033, 347, August 13, 1977)
- 27) Editorial: Seveso un anno dopo. L'ordine nella diossina. (Sapere No 802, 24-27, 1977) (Determination of TCDD in the human body)
- 28) Editorial: Seveso-Unglück: Teratogene Schäden wahrscheinlich. (Diagnostik 10: No 17, 20.10.1977)
- 29) Editorial: More dioxin found. (Chemical Week, page 22, October 5, 1977) -
- 30) Editorial: Erstes Treffen des Chlorakne-Ausschusses. (Pharm. Ind. 39: No 9, 866, 1977)
- 31) Fara, G.M.: Seveso: Studies on teratogenic and other chronic effects of chemical pollutants following an accident in a chemical plant. (Symp. "Detection of Teratogens", Montreal, 21.8.77; a special Symposium held in conjunction with the 5th Int. Conf. on Birth Defects)
- 32) Foa, V.: The Seveso Accident (pres. at IVth Medichem Congress, Haifa, September 1976)
- 33) Forth, W.: 2,3,7,8-Tetrachlorodibenzo-1,4-Dioxin (TCDD); das Unglück von Seveso Fakten und Wertung. (Deutsches Aerzteblatt 74: No 44, 2617-2626, 1977)

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- 35) Frigerio, A.: Che cos'è la TCDD e come si comporta chimicamente. (Negri News 11: No 1, 2, 1977)
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- 37) Fuller, J.G.: Seveso: cronaca di un disastro (Selezione dal Reader's Digest 166-203, 1977) (German version)
- 38) Garattini, S.: TCDD poisoning at Seveso. (Biomed. 26: 28-29, 1977)
- 39) Garattini, S.: La diossina va combattuta con decisione e continuità. (Negri News 11: No 1, 1, 1977)
- 40) Gianotti, F.: Chloracne au tetrachloro 2,3,7,8 dibenzo-pdioxine chez les enfants. (Société Française de Dermatologie, Paris, 9-10 mars 1977)
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- 56) <u>Leonardi, A.:</u> Affinchè non si ripetano altre Seveso. (Negri News <u>11</u>: No 1, 5, 1977)
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- 67) Rawls, R.L., O'Sullivan, D.A.: Italy seeks answers following toxic release. (C & EN pp 27-35, August 23, 1976)
- 68) Reggiani, G., Beylier, M.-F.: Seveso: Mise au point médicale de Givaudan-Roche (Méd. & Hyg. 35: 1154-1158, 1977)
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- 73) Reggiani, G.: Medical problems raised by the TCDD contamination in Seveso/Italy. (5th Int. MEDICHEM Congress, San Francisco, September 1977) (Arch. Toxicol. 40: 161-188, 1978)
- 74) Reggiani, G.: The estimation of the TCDD toxic potential in the light of the Seveso accident. (20th Congress of the European Society of Toxicology, Berlin, June 25-28, 1978) (Arch. Toxicol., Suppl. 2: 291-302, 1979)

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- 76) Rondia, D.: L'accident de Seveso et la responsabilité industrielle en matière de produits. (Conférence tenue à l'Université de Liège, 1977)
- 77) Rosa, E.: Il crimine di Seveso. (Le Scienze No 104, 7-9, April 1977)
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- 104) <u>Puccinelli, V. et al.:</u> Patologia dermatologica specifica nella zona di Seveso dal luglio 1977 al febbraio 1978.

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APPENDIX 3:

- A. LISTING OF ITEMS REFERENCED BY DR. REGGIANI, BUT NOT PROVIDED IN SUPPORTING DOCUMENTATION
- B. LISTING OF RELEVANT PUBLICATIONS BY DR. REGGIANI,
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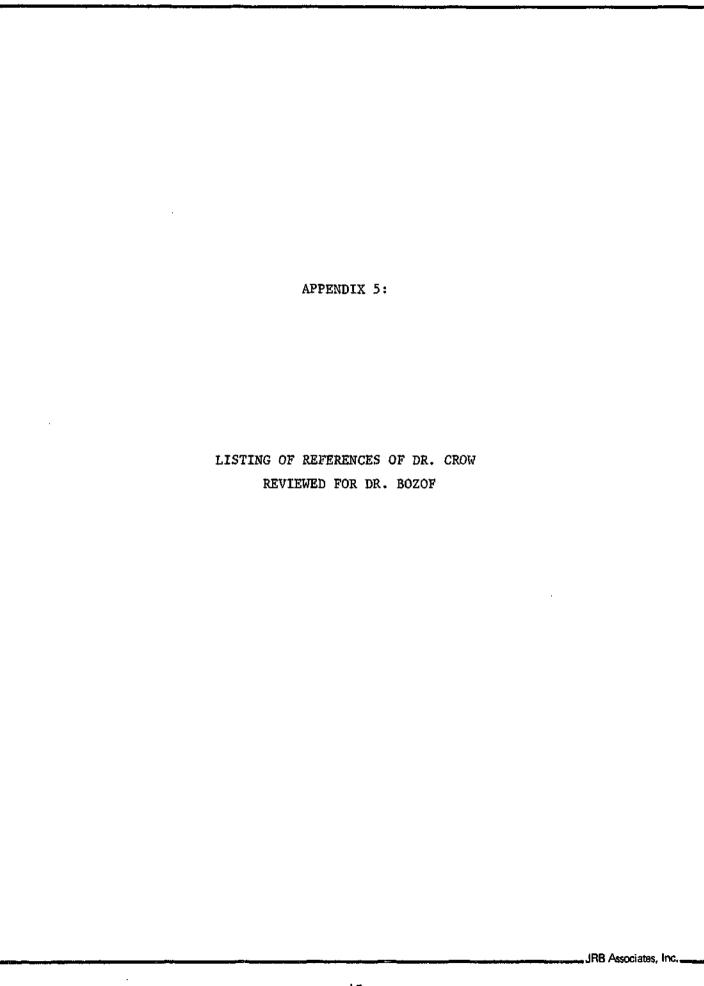
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APPENDIX 4:

LISTING OF SUPPORTING DOCUMENTS
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- 11. Laboratory tests for the detection of damage to specific metabolic functions of organs (liver, kidney) or of altered serum composition, of blood morphilogy, etc. carried out between July, 1976 and October, 1977.

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APPENDIX 6: LISTING OF ADDITIONAL DOCUMENTS OBTAINED FOR DR. BOZOF "JRB Associates, Inc."

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