2000 ANNUAL REPORT

OF

THE BIOLOGICAL AND CHEMICAL DEFENCE

REVIEW COMMITTEE

THE COMMITTEE

Heather D. Durham (Chair)
Colin R. McArthur
Kenneth L. Roy

September 2000

SUMMARY

This report records the year 2000 activities of the Biological and Chemical Defence Review Committee (BCDRC). It also indicates the current state of the implementation of the recommendations made in the 1988 Barton Report and the reactions by the Department of National Defence (DND) to recommendations contained in previous BCDRC reports.

We have concluded that there are neither indications of duplicity within Canada's biological and chemical defence program nor evidence that offense related activities are being conducted either on behalf of Canadian authorities or to comply with any multilateral treaty commitment.

It is our opinion that Canada should retain the capability to conduct a modest program of defensive research and development to permit military operations under the threat of biological and chemical weapons.

The Committee recommends that: in the research and development of new medical countermeasures against chemical and biological agents, eventual regulatory requirements be considered at early stages and all data be collected and records maintained according to Good Laboratory Practice (GLP) guidelines to facilitate the approval process.

INTRODUCTION

The policy of the government of Canada is to press for global, comprehensive and verifiable treaties to ban all biological and chemical weapons. However, while the threat from such weapons endures, Canada has an obligation to ensure that members of the Canadian Forces (CF) have adequate training and equipment to protect themselves against exposure to chemical and biological agents.

On the other hand, the Canadian public has the right to be assured that Canada's policy of maintaining only a defensive capability in this field is fully respected at all times, and that any research, development and training activities undertaken pose no threat to public safety or the environment.

To facilitate this assurance, the Biological and Chemical Defence Review Committee (BCDRC) was established by the Minister of National Defence. The Committee is mandated to review annually the research, development and training activities in biological and chemical defence (BCD) undertaken by the Department of National Defence (DND) to ensure that they are defensive in nature and conducted in a professional manner with no threat to public safety or the environment (BCDRC Responsibilities are in Annex C).

The Committee members' appointments are approved by the Deputy Minister of National Defence and the Chief of the Defence Staff on the recommendation of the Committee Chairperson. Nominations for BCDRC membership are solicited by the Chairperson from the Royal Society of Canada, the Canadian Federation of Biological Societies, the Canadian Society of Microbiologists, the Chemical Institute of Canada, and the Society of Toxicology of Canada.

The present members are:

Chair Dr Heather D Durham
McGill University [Toxicology]

Member Dr Colin R McArthur
York University [Chemistry]

Member Dr Kenneth L Roy
University of Alberta [Microbiology]

Commencing in 1990, Annual Reports have been submitted. All have been made available to the public (see Annex B).

COMMITTEE ACTIVITIES -- 2000

Between 04 May and 02 June 2000, the following DND Establishments including the associated ranges, laboratories and training facilities were visited:

National Defence Headquarters with staff briefings from:

Defence R&D Canada (DRDC)
Deputy Chief of the Defence Staff
Directorate Nuclear, Biological and Chemical Defence
Directorate of Arms Control Verification
Directorate of Scientific and Technical Intelligence
Director General of Health Services
Canadian Forces Medical Group/Operational Medicine

Combat Training Centre (CTC), Gagetown, New Brunswick with briefings about the biological and chemical training being undertaken at combat arms schools and in major units;

Canadian Forces Nuclear, Biological and Chemical (CFNBC) School with briefings about its responsibilities, resources and training;

Defence and Civil Institute of Environmental Medicine (DCIEM) with briefings about the biological and chemical components of its 2000 research and development (R&D) program; its occupational health and safety, environmental protection and animal care programs; and its Human Subject Ethics Committee.

Defence Research Establishment Suffield (DRES) with briefings about the responsibilities and resources of DRES; the CBD program; and the future of DRES in the newly established DRDC Agency. While at DRES, the BCDRC held discussions with the General Safety Officer, the Biological Safety Officer and a union representative. Work of the Human Research Ethics and Animal Care Committees was reviewed. The Committee toured the facilities and invited research scientists to describe their projects. Time was made available to allow any member or groups of members to approach us to discuss matters of concern. These activities provided useful insights into the program and morale at Suffield.

Reports were presented to the Committee by representatives from the Department of Foreign Affairs and International Trade (DFAIT) about the status of the Chemical Weapons Convention and the Biological and Toxins Weapons Convention and three Canadian non-governmental agencies that have biological or chemical R&D contracts with DRES or DCIEM.

We reviewed DND's 2000 BCD Research and Development (R&D) Program and determined that it was in accordance with current Canadian Government Policy. The latest versions of the DRES Service Level Agreements, DCIEM Fact Sheets, current R&D contracts and publications lists were examined.

In addition, the DRDC accountability documents were scrutinized.

To enhance our perspective of the concerns of Canadians in Canada's biological and chemical defence activities the Committee invites any group of concerned citizens to meet to discuss issues. The committee met with John Bryden, MP, in Ottawa to update him on the committee's activities. No other group came forward during the 2000 BCDRC visits. Any group or individual that wishes to make representation to the committee should contact the executive officer in writing.

In October, the chair of the BCDRC, Dr Heather D Durham, attended the DND Annual NBC Defence Workshop in Arnprior, Ontario.

On 4 May, Dr. Durham represented the Committee at a ceremony at DRES, which recognized the participation of Canadian servicemen in chemical agent research at Suffield during the Second World War. Also attending the ceremony were the Minister of National Defence, the Honourable Art Eggleton; veterans who were being honoured; Mr John Bryden, MP, a published author on the subject of chemical and biological research and advocate of the event; the Director General of DRES, Dr Robert Angus; members of the staff of DRES and the public.

Dr Durham will attend the DND Annual NBC Defence Workshop scheduled for October 2000. Dr Ken L Roy will attend the Senior Officers NBC Course at the CFNBC School in November 2000.

IMPLEMENTATION OF BARTON REPORT RECOMMENDATIONS

The current implementation status of the Barton Report recommendations was ascertained to be:

GENERAL

1. **In the course of the annual program and budgetary process, the authorizing officer at each level be required to sign a certificate of compliance with Departmental policies.**

   Certificates of Compliance for 2000 were reviewed and found to be in order.

2. **A senior Review Committee be established in association with the Defence Science Advisory Board (DSAB).**

   We constitute such a Committee. In 1997 the Committee was removed from the aegis of the DSAB and established as a self-administering agency (see Annex C).

3. **"Second opinions" should be obtained from outside sources on some of the potentially controversial test programs.**

   The BCDRC suggested that the most effective way to obtain credible second opinions would be to establish external committees and to encourage collaboration through workshop type conferences. As a result, once security concerns were satisfactorily addressed, a DRDB Technology Investment Workshop on biotechnology was held in November 1996. Also an independent Peer Review of the DRES BCD R&D program was conducted in June 1997. Defence R&D Canada is in the process of establishing an Advisory

Board comprised of representatives of other government departments, industry and academia.

4. **A document be prepared annually which would set out the nature of the research and development work under way, the number of people involved, and allocated funding.**

   The 1990/91 Chief Research and Development (CRAD) Review was published in February 1992 and the 1991/92 Review in January 1994. The Defence Research and Development, Science and Technology for the New Century was published in March 1996. The initial Defence Research and Development Branch Outline of Program was published in April 1996, the second edition in June 1997 and the third edition in June 1998. The branch has produced its first annual report, covering the fiscal year 1998/99. The report satisfies this recommendation. The report is published on the DRDC web site: http://www.crad.dnd.ca.

5. **A layman's pamphlet be published which would help improve public understanding about Biological and Chemical Defence.**

   An appropriate departmental pamphlet was published in August 1990. A similar pamphlet entitled "Meeting the Challenge - Research and Development in Defence Sciences and Technologies", emphasizing the work at DRES, was published in April 1993. DRDB published "Defence R&D Highlights" six times yearly and the web site (http://www.crad.dnd.ca) has been established and continues to grow. In addition, DCIEM and DRES publish Fact Sheets recapitulating the essential components of their R&D programs.

6. **A DND directive on policies and procedures regarding the use of volunteers and animals be published.**

   DND Policy - Animal Use in R&D was issued on 15 June 1989. Defence Administrative Orders and Directives (DAOD) 5061-0 and 5061-1, Research Involving Human Subjects, were issued on 20 August 1998.

DRES

1. **A procedure be established to ensure that the DRES Safety Manual is reviewed at prescribed regular intervals of not more than three years. Safety drills should also be conducted at prescribed regular intervals.**

   An effective, dynamic safety program has been established. Drills and exercises are conducted and any safety related issues are resolved quickly.

2. **An automatic annual review and certification procedure be instituted to confirm that stocks of toxic agents are being kept to the minimum level necessary for the conduct of an efficient research and development program.**

   The annual inventory audit was reviewed by the BCDRC in May 2000. Chemical agent holdings were verified then. Biological agent holdings had been verified by one committee member in February 2000. The committee agrees that stocks are being properly maintained at a minimum level which in most cases is only a fraction of the authorized levels.

3. **The arrangements being implemented to improve security and access controls be expedited.**

   Completed.

4. **Pending the destruction of the excess agent stocks now stored in the Experimental Proving Ground (EPG), the adequacy of existing physical security arrangements be reviewed with a view to strengthening them.**

   Completed.

5. **The incinerator which is to be acquired for the program be considered for use in the destruction of other dangerous industrial chemicals, including PCBs.**

   The Alberta Provincial Government legislated this recommendation unimplementable. The incinerator was sold and its removal from DRES was completed by 6 August 1992.

6. **The Experimental Proving Ground (EPG) operation and maintenance be given "project" status within the CRAD program.**

   Implemented. Thus positive visibility is given to all activities, funding and personnel involved in the EPG and ensures an annual review as a separate program component.

7. **The scope of the safety and environmental requirements governing outdoor testing at DRES be determined by the provisions of the Canadian Environmental Protection Act.**

   Although the present Act does not include such express provisions, the Federal Minister of Environment has said that the department will develop the requisite guidelines as and when necessary. In addition, a staff control system is in place and functioning to ensure compliance with all constraints.

8. **A full environmental audit of DRES be commissioned as soon as possible and that it be repeated at regular intervals of, say, five years.**

   Acres Consultants Ltd, having completed the audit under a Supply and Services Canada contract, submitted their final report in February 1992. An internal staff agency was created to initiate recommendation compliance. All the Report's recommendations have been addressed and full compliance is anticipated. The Acres' report has been deposited with the Canada Institute for Scientific and Technical Information (CISTI), the National Library and major university libraries throughout the country. The first follow-on audit was conducted by Acres International Ltd in early 1997 and the report was received at DRES on 31 March 1997. An action plan to address the recommendations and to correct the deficiencies has been introduced. The BCDRC reviews progress annually.

DREO

As the entire Defence Research Establishment Ottawa (DREO) chemical agent inventory has been destroyed, all storage and handling facilities removed, laboratories dismantled and the facility decommissioned, the BCDRC will no longer report on DREO activities.

IMPLEMENTATION OF BCDRC REPORT RECOMMENDATIONS

Note: Once a recommendation has been complied with to the satisfaction of the Committee it will cease to be included in subsequent Reports. However, if the effect of the recommendation is of a continuing nature it will be subject to periodic monitoring by the Committee.

1. **The flow of information within the Defence Research laboratories between sections, management and staff might be improved -- possibly through occasional informal meetings and discussions with senior managers.**

   Although there is some improvement in awareness levels, additional effort is required. Monitoring at DRES will continue.

2. **The Annual Agent Inventories Audit Reports be restructured as follows:**

   a. **biological agents used for research purposes are to be identified by complete strain or antigenic designator;**

   b. **stocks of biological agents are to be quantified in meaningful terms; i.e., infectious titres or colony-forming units per given volume; and**

   c. **stocks of biological agents that are clearly not agents of biological warfare should be identified as such with an accompanying statement to the effect that such agents may be found in Public Health, University and Industrial laboratories.**

   Approved. This work will be completed in accordance with a schedule agreed to by BCDRC and DRES. There is satisfying progress and monitoring will continue.

3. **The biological agent holdings of DRES be restricted to those microorganisms that are in frequent use or not readily available from central strain repositories.**

   Approved. Compliance will be effected in accordance with a schedule agreed to by BCDRC and DRES. Progress is being made towards this goal. Monitoring will continue.

4. **The BCDRC be contractually guaranteed access to all private sector laboratories that become involved in the Biological and/or Chemical Defence Research and Development program either under the prevailing contracting system or through the auspices of the industrial partnership proposal.**

   This recommendation was approved in 1994. To date, DRDC has not resolved this issue with Public Works and Government Services Canada (PWGSC), the contracting agency. Although contractors routinely provide formal briefings to BCDRC during our annual visits to DRES and DCIEM and circumstances have yet to arise when BCDRC has considered an on-site visit necessary, the committee does not have guaranteed access to such private sector laboratories. Discussions between DRDC and BCDRC continue in order to resolve this issue in a manner which respects the committee's mandate to verify the defensive nature of all work carried out under DND's auspices and the proprietary nature of private sector research.

5. **The authorized maximum quantities of chemical agent stocks at DRES be reviewed.**

   Approved. Maximum quantities are reviewed annually in preparation for inspection of the single small-scale facility under the Chemical Weapons Convention. The committee considers this item completed and the recommendation will be dropped from this listing in next year's report.

6. **For research purposes, vaccine strains of bioagents in lieu of pathogenic strains should be used whenever possible.**

   Approved. This work will be completed in accordance with a schedule agreed to by BCDRC and DRES. Monitoring will continue.

7. **The CFNBC School Training Library collection be reviewed and dated reference material be replaced. Additionally, the ability to access information servers, e.g.; Internet or World Wide Web, be provided.**

   Agreed. Marked progress has been made in this endeavour. The library has Internet access and is using it to obtain scientific material. Monitoring will continue.

8. **The skills of the present DRES Staff be reviewed to ensure that no critical imbalances have been created that might affect productivity, safety or responsiveness.**

   The current DRES staff is under continual review. Budgetary restrictions have not resulted in compromise of safety, which continues to be of the highest standard. However, for Defence Research Establishments to maintain productivity and their current world class reputation, continuing education of staff through attending courses and scientific meetings is mandatory. To ensure continued performance over the long term, new recruitment will be required to provide continuity upon retirement of several senior scientists over the next few years and to provide expertise in new fields of biotechnology. To complement existing expertise, recruitment of scientists in modern molecular genetics and related fields is encouraged.

9. **The DRES Safety Manual and Emergency Response Plans be up-dated and tested at least annually.**

   Agreed. Monitoring will continue.

10. **DRES replace the current computer-based agent inventory control system with a simplified program.**

    Agreed and implemented. In 2001, monitoring will continue to verify the suitability and accuracy of the program. If the recommendation has been fully complied with, it will be removed from this listing in the following year's report.

11. **DRES complete by 31 March 1998 the three previously accepted recommend-ations whose compliance is dependent upon the reopening of the containment facility (our 1993, 1994 and 1995 Reports refer).**

    The Level III containment facility has been reopened and the recommendations are being implemented as agreed between DRES and the BCDRC. This

recommendation will be dropped from this listing in next year's report.

12. **DRES procure two portable, high-resolution, close-focussing cameras compatible with the existing system for surveillance of the containment facility to permit the detailed inspection of level III agent holdings from an external video monitor.**

    Agreed. Installation has been completed and the system permitted the verification of holdings in February 2000. This recommendation will be dropped from this listing in next year's report.

13. **Consideration be given to authorizing at least two personnel annually from the "National Medical Decontamination Platoon" (about to be established) to participate in live, chemical agent training at DRES.**

    Agreed, however the "National Medical Decontamination Platoon" was not established.

14. **The BCDRC mandate be amended to include an annual visit to Health Canada's Laboratory Centre for Disease Control (LCDC) in Winnipeg whenever research is being conducted there either by or directly for DRES.**

    The recommendation will be acted upon by DRDC once DND and Health Canada have completed a memorandum of understanding under which such work could be conducted at LCDC.

15. **DRES renegotiate the annual containment facility decontamination contract to permit the verification of its biological agent holdings by the BCDRC during the annual May visit.**

    DRES has agreed and, in 2001, the committee will verify agent holdings prior to decontamination of the facility.

SOME IMPORTANT ISSUES

Concerned Citizens Groups

In the past, during the course of meetings with representatives of special interest groups and of the media, a few primary concerns have been identified and reasoned responses were given by the Committee at those times. However, two specific concerns do merit recorded comment. Based on our research and discussions with DND personnel, we offer the following:

1. Concern: How do interested persons differentiate with unequivocal confidence between offensive and defensive research.

   Comment: In general, the Committee believes that it is neither possible nor profitable to try to rigorously define the scope of these activities. However, offensive and defensive biological and chemical research can be at least partially defined in terms of the quantities involved, the activities in progress and the general intent.

   Quantities are more easily defined with chemical agents since defensive activities, such as equipment testing and decontamination drills involve only small amounts of agent, well within the limits proscribed by the provisions of the

Chemical Weapons Convention (CWC). Equally, precursor chemicals should correspond on a chemical equivalence (or molar) basis with the actual agent. These quantities should be traceable from source to end agent provided that trading and shipping procedures are kept under scrutiny. Biological agents are more difficult to quantify, per se, since large amounts can be grown from a small viable colony. However, even then materials such as growth media, and sometimes specific pieces of equipment, are necessary and should be traceable and accountable.

Activities can be subdivided into development of new or modified agents, testing procedures, and training protocols. In either chemical or biological research, it would be reasonable to consider deliberate attempts to enhance persistence, virulence or toxicity, or to circumvent existing defence procedures, as offensive in nature. In testing, one could differentiate between testing the agent for the properties suggested above, and testing the defensive equipment against known or suspected agents. The former should raise suspicions of offensive activity unless justified in relation to defensive capability. The latter should be part of any responsible defensive activity. Similarly, training to deliver chemical or biological agents is clearly offensive while training to protect against or neutralize such agents is a necessary part of a defensive posture.

Intent is the least fathomable aspect. It relies heavily on inter-personal contact and interaction, and progress in confidence building measures. This point has also been outlined in the paper by Dr. David L Huxsoll of Louisiana State University, printed in Volume 666 of the Annals of the New York Academy of Sciences [The Microbiologist and Biological Defense Research: Ethics, Politics and International Security] dated 31 December 1992 to which the Committee referred in the 1994 report.]

2. Concern: Obtaining information from DND is a daunting and time-consuming activity.

   Comment: As specific incidents could not be identified, it is difficult to offer an adequate response. However, if requests for information or for assistance in request formulation are addressed to either the Director General Public Affairs or to the Access to Information Coordinator in National Defence Headquarters, we are confident that positive results in accordance with current regulations will be forthcoming.

Defence R&D Canada

During fiscal year 1999-2000, the Defence Research and Development Branch (DRDB), organized under the Chief of Research and Development (CRAD), reporting to the Assistant Deputy Minister (ADM) Materiel, has disappeared. It has been replaced by Defence R&D Canada (DRDC) under the ADM Science and Technology, Dr John Leggat. DRDC is an agency within DND, which is to provide leadership to DND, the Canadian Forces and the Canadian defence industrial base. An important change from the old branch is that the agency will retain revenues generated by conducting projects for clients outside DND.

BCDRC concludes that DRES will be conducting more biological and chemical research with non-governmental organizations

in the future. With reductions in government spending, DRES, as part of DRDC, is relying more and more on external funding for its programs in Defence research and development and on contractual arrangements with academic and industrial partners to conduct specific projects. This has positive aspects including maximizing R & D dollars, promoting Canadian industry and increasing interaction between DRES scientists and academic colleagues. However, BCDRC considers this work part of DND's research program in CBD and it will be the Committee's responsibility to verify that this research is all defensive in nature (see BCDRC Report Recommendation #4).

COMMENT

We would like to express our appreciation for the explicitness and cooperation given to us throughout our 2000 visits' schedule. In particular, this year, by the middle of April, DRDC provided the BCDRC with numerous documents that we had to review in order to appraise the DND BCD program. The ability to read these documents beforehand, and ask questions about them during the visits, increased the efficiency of our use of time.

Within DND's R&D program, the quality of science, the projects underway, the resultant publications, and the level of safety awareness continue to be of a high standard.

In February 2000, Dr Ken Roy verified the biological agent holding at DRES using a new video camera system. The system worked very well and he was satisfied that he was able to verify the items. This arrangement does not preclude a Committee member from entering the containment facility in the future if physical inspection of the agent holdings were to be deemed necessary, as long as this member complies with all safety regulations including mandated vaccination requirements. The BCDRC agreed to have the February, 2000 verification serve for both 1999 and 2000 because, during the May 2000 visit, the biological agents were sealed in storage freezers during decontamination of the DRES Level III Containment Facility. However, in 2001, the Committee will visit DRES prior to decontamination of the Level III facility and will verify the biological agents at that time, according to the usual schedule.

It is considered that Canadian participation internationally in matters related to BCD such as participation in collaborative projects through Memoranda of Understanding and previous participation in the United Nations Special Commission on Iraq (UNSCOM), is of notable importance both to Canada and professionally within DRDC and should be continued.

Although statements describing all existing contracts with outside agencies are open to our review, the continuation of an annual briefing of the BCDRC by a cross-section of selected contractors is deemed to be necessary in order to provide us with complete confidence in the total program. This is particularly important given the increasing emphasis on contractual arrangements to carry out research and the conversion the Defence Research and Development Branch to Agency status.

As the CF deploy more frequently and with little warning to the lesser developed areas of the world, due recognition and effort should be given by the research and medical elements of DND to endemic natural biological hazards as well as those biological entities defined as agents. Also of concern to the responsible DND elements should be the threat of accidental or intentional dispersal of toxic industrial material, especially hazardous products of the chemical

industry, in UN/NATO theatres of operations and in Canada as the domestic terrorist threat increases. In this regard, DRDC now has the mandate to provide operational support in the areas of Toxic Industrial Materials and endemic disease to deployed military personnel.

Response to terrorist threat involving chemical or biological agent involves a coordinated response by several different agencies and government departments, including DND. The expertise of Defence Scientists, the Nuclear Biological and Chemical Response Team (NBCRT), and general support available to the Solicitor General all contribute to the ability of Canada to respond in case of these events. In this regard, the preparedness of Canada to respond depends upon the kind of expertise developed within DND's CBD program and is an additional reason for preserving its strength. In this regard, DND might also assess the mission and activity of the NBCRT, located at the CFNBC School, to determine if the organization should have a more formal establishment of personnel and equipment.

Middle East, African and Asian events, the current state of political affairs in Eastern Europe and Canada's involvement in peace restoration and peacekeeping operations in the lesser developed areas of the world where a threat of biological and chemical warfare often exists, all suggest that a discreet R&D program aimed at maintaining state-of-the-art detection and protection devices and effective medical countermeasures should continue. In addition, initial and annual refresher training designed to comply with National Defence Headquarters (NDHQ) Policy Directive P6/93 of 03 August 1993 should be carried out by all uniformed members of DND. The BCDRC is pleased to see the development of new policy directives DAOD 8006-0, Nuclear, Biological and Chemical (NBC) Defence Policy and DAOD 8006-1, Instructions for Nuclear, Biological and Chemical (NBC) Defence. The Committee sincerely hopes that these directives will focus more attention on BCD within DND and raise the level of competence in BCD throughout the CF.

CONCLUSIONS

The BCDRC found neither indications of duplicity within Canada's biological and chemical program nor evidence that offense related activities were being conducted either on behalf of Canadian authorities or to comply with any multilateral treaty commitment.

We remain convinced that Canada must retain a modest capability to effect essential defensive research and development to permit the conduct of conventional military and counter-terrorist operations under the threat of biological and chemical weapons. We believe that Canada's ability to respond rapidly and effectively to biological and chemical threats, domestically or offshore, will depend upon the maintenance of core expertise in defence science within DND. It is our opinion that the priority of effort should be accorded to the following projects, which in addition to their obvious military relevance also contribute to treaty monitoring, medical support, pollution control and the handling of toxic wastes:

a. agent detection and identification;

b. prophylaxis and therapy for threat agents;

c. development of less physiologically burdening individual protective clothing with wider geographical and employment specific pertinence;

d. refinement of procedures to foresee and assess hazards posed by both established and hypothetical chemical and biological agents; and

e. improved decontaminants.

RECOMMENDATIONS

Canadian Defence Scientists have been at the forefront of R& D in medical countermeasures against chemical and biological agents. Defined regulatory requirements are in place to ensure the safety of administering preventative treatments and post-exposure countermeasures to deployed military personnel. However, requirements are becoming more stringent and these treatments will be subject to the same review and approval process by Health Canada as are pharmaceuticals and medical devices for general use in the population. Full licensing of countermeasures will also increase the potential market for their use in civil defence in case of terrorist use of chemical or biological agents. To facilitate the approval process, it is recommended that eventual regulatory requirements be considered at early stages of R& D and all data be collected and records maintained according to Good Laboratory Practice (GLP) guidelines.

ANNEX A

BIOGRAPHIES OF COMMITTEE MEMBERS

Dr. Heather D. Durham (Chair)

A graduate in Pharmacology from the University of Western Ontario and the University of Alberta, she is a professor in the Department of Neurology and Neurosurgery and a Killam Scholar at the Montreal Neurological Institute, McGill University. Among her many appointments and affiliations, she is President of the Society of Toxicology of Canada, a member of the Board of Directors of the Canadian Federation of Biological Societies, and a member of the Scientific Advisory Board of the Muscular Dystrophy Association.

Dr. Colin R. McArthur

A graduate in Chemistry from the University of Western Ontario and from the University of Illinois, he has experience in the industrial and academic sectors. He is Professor Emeritus and past Chair, Department of Chemistry at York University, and Senior Scholar there. He is a member of the Canadian Society for Chemistry, of the International Union of Pure and Applied Chemistry, and a Fellow of the Chemical Institute of Canada.

Dr. Kenneth L. Roy

A graduate in biochemistry from the University of British Columbia, with postdoctoral studies at Yale University; he was a member of the Department of Microbiology at the University of Alberta for more than twenty years, and is now a Professor of Microbiology and Molecular Genetics in the Department of Biological Sciences at that institution. He has held a number of committee appointments at the University of Alberta, including Biosafety and Radiation Control, and is a member of the Canadian Society of Microbiologists and the Society for Industrial Microbiology.

ANNEX B

REFERENCES FOR PREVIOUS REPORTS

Research Development and Training in Chemical and Biological Defence within the Department of National Defence and the Canadian Forces: A Review by William H. Barton, Minister of Supply and Services Canada, 1989, p.54. [Available in Canada through the Canadian Government Publishing Centre, Supply and Services Canada, Ottawa, Ontario K1A 0S9 (Catalogue No. D2-79/1989E, ISBN 0-660-13103-X) and Web Site http://www.vcds.dnd.ca/bcdrc/index.html.]

PREVIOUS BCDRC REPORTS

All are available through Web Site http://www.vcds.dnd.ca/bcdrc/index.html and National Defence Headquarters Library Services, National Defence Headquarters, MGen GR Pearkes Building, Ottawa, Ontario K1A 0K2.

First Annual Report of the Biological and Chemical Defence Review Committee, Minister of National Defence, Ottawa, 1991, p.7. It is also included in the second annual Review of the Chemical and Biological Defence Program January 1990 - April 1991, Minister of National Defence, Ottawa, February 1992, pp.28.

Second Annual Report of the Biological and Chemical Defence Review Committee, is included in the third annual Review of the Chemical and Biological Defence Program May 1991 - March 1992, Minister of National Defence, Ottawa, January 1994, pp.26.

Third Annual Report of the Biological and Chemical Defence Review Committee, is included in the fourth annual Review of the Chemical and Biological Defence Program April 1992 - March 1993, Minister of National Defence, Ottawa, September 1996, pp.26.

1993 Annual Report of the Biological and Chemical Defence Review Committee, Minister of National Defence, Ottawa, June 1995, pp.9.

1994 Annual Report of the Biological and Chemical Defence Review Committee, Minister of National Defence, Ottawa, June 1995, pp.9.

1995 Annual Report of the Biological and Chemical Defence Review Committee, Minister of National Defence, Ottawa, February 1996, pp.9.

1996 Annual Report of the Biological and Chemical Defence Review Committee, Minister of National Defence, Ottawa, April 1997, pp.9.

1997 Annual Report of the Biological and Chemical Defence Review Committee,

Minister of National Defence, Ottawa, March 1998, pp.9.

1998 Annual Report of the Biological and Chemical Defence Review Committee, Minister of National Defence, Ottawa, December 1998, pp.9.

1999 Annual Report of the Biological and Chemical Defence Review Committee, Minister of National Defence, Ottawa, February 2000, pp.9.

ANNEX C

BIOLOGICAL AND CHEMICAL DEFENCE REVIEW COMMITTEE

RESPONSIBILITIES

GENERAL

1. The Biological and Chemical Defence Review Committee (BCDRC) is to review annually the research, development and training programs in biological and chemical defence undertaken by the Department of National Defence (DND) to ensure that all activities within those programs are, in fact, defensive in nature and are conducted in a professional manner with no threat to public safety or the environment.

EXECUTION

2. The BCDRC will annually:

a. visit:

(1) The Defence Research Establishment Suffield (DRES);

(2) The Defence and Civil Institute of Environmental Medicine (DCIEM);

(3) The Canadian Forces Nuclear, Biological and Chemical (CFNBC) School; and

(4) at least two other DND Establishments where biological and chemical training is conducted;

b. review the annual DND Research and Development Program as originated by the Assistant Deputy Minister Science and Technology (ADM(S&T)) and approved by the Defence Management Committee;

c. review the implementation of the recommendations made in the:

(1) BARTON REPORT of 31 December 1988;

(2) periodic Independent Environmental Audits of DRES; and

(3) previous BCDRC Reports;

d. examine the DRES and DCIEM Annual Reports, activities and records of the Human Research Ethics and Animal Care Committees and the current research and development contracts and publications lists; and

e. submit a report of their activities and findings to the Chief of the Defence Staff (CDS) and the Deputy Minister (DM) of National Defence.

COORDINATION

3. The Committee, consisting of a chairperson and two members representing the disciplines of chemistry, microbiology and toxicology, is to be appointed for terms of three years by the DM/CDS on the recommendation of the pertinent learned society and the Committee Chairperson.

4. The BCDRC will be self-administering. It shall select an executive officer to attend to all procedural, reporting, coordination and administrative matters as directed by the BCDRC. The Executive Officer will establish liaison with and effect all tasking in support of BCDRC activities through the designated National Defence Headquarters (NDHQ) contact officers from the Directorate of Nuclear, Biological and Chemical Defence (DNBCD) and Defence R&D Canada (DRDC). The Executive Officer will coordinate financial and security issues with D NDHQ Secretariat. BCDRC members and the Executive Officer must be in possession of a valid Level II (Secret) Security Clearance.

5. Upon receipt of the annual BCDRC report, the DM/CDS will respond to the BCDRC Chairperson in a reasonable time. All elements of DND are to provide assistance to the BCDRC as necessary and the required access to all relevant facilities, personnel and information required to meet the mandate of the BCDRC.