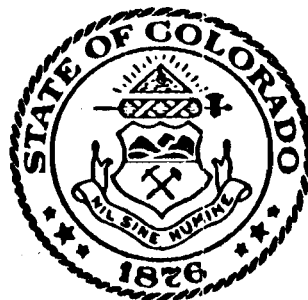


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No. 174

Report to the Colorado General Assembly

**CONTROLLING WEATHER
MODIFICATION ACTIVITIES**



COLORADO LEGISLATIVE COUNCIL

RESEARCH PUBLICATION NO. 174

November, 1971

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OF THE
COLORADO GENERAL ASSEMBLY

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* * * * *

The Legislative Council, which is composed of six Senators, six Representatives, plus the Speaker of the House and the Majority Leader of the Senate, serves as a continuing research agency for the legislature through the maintenance of a trained staff. Between sessions, research activities are concentrated on the study of relatively broad problems formally proposed by legislators, and the publication and distribution of factual reports to aid in their solution.

During the sessions, the emphasis is on supplying legislators, on individual request, with personal memoranda, providing them with information needed to handle their own legislative problems. Reports and memoranda both give pertinent data in the form of facts, figures, arguments, and alternatives.

**CONTROLLING WEATHER
MODIFICATION ACTIVITIES**

**Legislative Council
Report to the
Colorado General Assembly**

**Research Publication No. 174
November, 1971**

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LEGISLATIVE COUNCIL

ROOM 46 STATE CAPITOL
DENVER, COLORADO 80203
892-2285
AREA CODE 303

November 26, 1971

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REP. HIRAM A. McNEIL

REP. PHILLIP MASSARI

REP. CLARENCE QUINLAN

To Members of the second regular session of the Forty-eighth Colorado General Assembly:

In accordance with the provisions of section 63-4-3, C.R.S. 1963, which authorizes the Legislative Council in part to "...consider important issues of public policy and questions of state-wide interest...", on June 28, 1971, the Council appointed a Committee to examine the problems associated with weather modification in Colorado. The Council believed such a study was needed, because controversies which are beginning to result from the increasing number of weather modification projects throughout the state indicate that existing weather modification statutes are inadequate.

In accordance with the above discussed action, the Legislative Council herewith submits the accompanying report and recommendations pertaining to matters of weather modification.

The report of the Committee appointed to carry out this study was accepted by the Legislative Council for transmittal to the Governor and the Second Regular Session of the Forty-eighth Colorado General Assembly.

Respectfully submitted,

/s/ Representative C. P. (Doc) Lamb
Chairman

CPL/pm

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LEGISLATIVE COUNCIL

ROOM 46 STATE CAPITOL
DENVER, COLORADO 80203
892-2285
AREA CODE 303

November 26, 1971

Representative C. P. Lamb
Chairman
Colorado Legislative Council
Room 46, State Capitol
Denver, Colorado 80203

Dear Chairman:

The Committee appointed to study the problems of administering weather modification programs in Colorado herewith submits the following report for consideration by the Legislative Council.

Respectfully submitted,

/s/ Representative Clarence Quinlan
Chairman
Committee on Weather Modification

CQ/mp

FOREWORD

Under its statutory authority, on June 28, 1971, the Legislative Council appointed a special committee to examine the conduct and operation of weather modification programs in Colorado. Legislators appointed to this committee were:

Rep. Clarence Quinlan Chairman	Rep. Forrest G. Burns
Sen. Hugh Chance	Rep. Wallace P. Hinman
Sen. Hugh C. Fowler	Rep. Hiram A. McNeil
Sen. Ted L. Strickland	Rep. Walter Younglund
Sen. Raymond P. Kogovsek	

The Council also authorized the appointment of two professional advisors -- Professor Lewis Grant, Department of Atmospheric Sciences, Colorado State University, Fort Collins, Colorado, and Mr. Henry C. Lansford, Information Officer, National Center for Atmospheric Research, Boulder, Colorado -- as ex officio members.

During the course of its deliberations the Committee conducted public hearings in Monte Vista, New Raymer, and Lamar, Colorado, and held informational meetings at the Department of Atmospheric Research, Colorado State University and at the field headquarters for the National Hail Research Experiment, Grover, Colorado. It also held two public hearings at the Capitol in Denver.

The Committee wishes to express its gratitude for the contribution of all of those who participated in its deliberations. The Committee would like to give particular credit to the efforts and contributions of Messrs. Grant and Lansford. It also wishes to thank Mr. John Kennedy, Director of Environmental Assessments, National Center for Atmospheric Research; Mr. Tom Ten Eyck, Executive Director, Colorado State Department of Natural Resources; and Messrs. Archie Kahan and William Douglas, United States Bureau of Reclamation, Denver, for their assistance.

Wallace Pulliam, Research Associate, and Brent Slaten, Research Assistant, Legislative Council staff, had the principal staff responsibility for assisting the Committee and preparing the Committee's report. Larry Bohning, Legislative Drafting Office assisted the Committee in preparing the text of the proposed legislation.

November 22, 1971

Lyle C. Kyle
Director

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COMMITTEE FINDINGS AND RECOMMENDATIONS

The Committee on Weather Modification was established by action of the Legislative Council on June 28, 1971, under the provisions of section 63-4-3, C.R.S. 1963, which authorizes the Council, in part, to "...consider important issues of public policy and state-wide interest...". The minutes of that meeting show that the Committee was established because portions of the San Luis Valley were experiencing a severe drought, and residents, rightly or wrongly, placed the blame on the hail suppression project in the Valley. A group of citizens in the San Luis Valley had formed a committee called the San Luis Valley Citizens Concerned About Weather Modification. This group of concerned citizens had planned a meeting with the Governor and had threatened a court battle to enjoin the hail suppression program. Because of the controversy surrounding the program and the apparent ineffectiveness of the existing weather modification control statute, the Council agreed that an examination of the situation by a committee was in order.

Existing Colorado Law

Colorado currently has a weather modification control statute -- 151-1-1 et seq., C.R.S. 1963 -- which requires anyone conducting a weather modification project to obtain a license. The current statute is administered by the Department of Natural Resources and the Director of that department is granted the power to establish rules, regulations, and practices reasonably necessary to effectuate the law. After reviewing this statute, the Committee found it to be inadequate. It is essentially a licensing law. Even though the Director is empowered to establish necessary rules and regulations, such references appear to apply largely to individual license requirements and not to project approval or rejection. Furthermore, if a person meets the requirements for licensure, and conducts his operation within the limits of that license, the law provides no clear guidelines or authority for regulation of the conduct of his operation.

Thus, once a license is granted, as long as the licensee's project is conducted under any terms established when the license was issued, the Committee found that the Director is, in reality, powerless to take any administrative action to stop or alter the program. Of course, court actions could be initiated to stop the program but these could be lengthy processes which might not provide the immediate type of action needed in emergency or questionable situations.

Committee Procedures

At the outset, the Committee recognized a need to meet several problems. For example, the Committee recognized it was dealing with a very controversial subject -- a subject which has been made controversial by the vast number of unsubstantiated claims made by weather modification in the last twenty years; by a lack of knowledge on the part of the public at large; and by the presence of a number of so-called "quacks" in the field. Generally, responsible weather modifiers and scientists agree that they are only now beginning to be able to provide solid objective answers to many of the scientific questions raised. Furthermore, the Committee's study was complicated by the fact that many of the current controversies over weather modification result from the strong beliefs and convictions of the people involved -- An example being, perhaps, the controversy existent in the San Luis Valley.

Committee Activities: To help meet these problems the Committee held three public hearings in areas of the state in which the subject of weather modification was, or had been at one time of interest to or at issue between, the local citizenry. These public hearings were held in New Raymer, Lamar, and Monte Vista, Colorado; in addition, the Committee met with the scientists of the Atmospheric Sciences Laboratory at Colorado State University; with the scientists at the field headquarters for the National Hail Experiment in Grover, Colorado (this program is being conducted under the direction of the National Center for Atmospheric Research, Boulder, Colorado); and held two meetings in the Capitol at Denver. The Committee found a general support from the people for weather modification programs. However, most of the people did express, at these hearings, a desire that the programs be based upon scientifically sound principles and that an administrative mechanism be established to regulate their operation and conduct.

Even though the above statement appears to be the general consensus of the vast majority of people who appeared at these hearings, it must be pointed out that there are some people who expressed a strong belief that man should not "tamper in any way with God's work". There were others who expressed a general doubt as to the value of weather modification programs; and many suggested that actual operations be curtailed until the "state of the art" in weather modification is further advanced than it appears to be at the present time.

Suggested guidelines for revising Colorado's weather modification statute. At the above-mentioned meetings, sev-

eral suggestions were made to the Committee on ways in which the existing statute might be strengthened. Among these were that the Committee follow the so-called "model law" for regulation of weather modification activities. This law is recommended by the membership of the Weather Modification Association. Another suggestion was that the Committee adopt the so-called Texas system which places the control of weather modification within that state's Water Development Board. A third recommendation was that the Committee consider establishing a special board to coordinate and regulate the activities of weather modifiers within this state. In summary, most of the suggestions would place the responsibility in the hands of a specific board instead of placing it singularly within the control of the Director of the Department of Natural Resources.

The Committee wishes to point out that the original Weather Control statute -- Chapter 295, Session Laws of Colorado 1951 (House Bill 251, 1951 session) -- created a "Weather Control Commission" composed of five members appointed by the Governor. One member was appointed from each of the four congressional districts and one member was appointed at large for five year overlapping terms (one new member was appointed each year). This provision was repealed by Chapter 94, Session Laws of Colorado 1962, and the responsibility for the regulation of weather modification programs was placed in the office of the Director of the Department of Natural Resources.

Committee Conclusions

Administration. The Committee considered reestablishing a control board, or placing the responsibility in the hands of the state Water Conservation Board, but, recognizing that the policy of the Committee on Reorganization of State Government is to discourage the tendency to add new boards, it rejected that approach. In fact, it was pointed out that it was the desire of the Committee on Reorganization of State Government to simplify the structure of state government that led to the abolishment of the aforementioned Weather Control Commission. The 1961 Legislative Council Report on Simplification of State Government (Research Publication No. 55, December, 1961), stated:

Weather Control Commission (Sections 150-1-1 through 150-1-14, 1953 Colorado Revised Statutes) -- In 1951, the General Assembly created a five-member Weather Control Commission to regulate the activities of persons attempting to modify the weather. Since its establishment, the commission has

been relatively inactive, possibly due to a reasonably adequate supply of moisture during this period. However, should another drought of major proportions occur, undoubtedly weather control activity would increase and there is consequently a need to retain the regulatory aspects of this state activity. At the same time, the committee believes that the duties of the commission can be placed in an existing state agency, thereby simplifying the administrative structure of state government. The committee therefore recommends that the commission be abolished and the administration of weather modification activities in this state be placed under the director of the Department of Natural Resources.

On this basis, the Committee concluded that the responsibility for regulating weather modification activities should be left to the office of the Director of the Department of Natural Resources.

Creation of an advisory committee. The Committee, however, recognizes that the Director may not have the scientific and technical expertise to adequately develop procedural guidelines, to evaluate license requirements, to evaluate individual qualifications, to review performance reports, to evaluate proposed weather modification projects, etc. Nor would he necessarily be able to recognize the impact of weather modification upon, nor the needs for weather modification by, various public, private and geographical interests within the state. To assist the Director in these specific areas, the Committee recommends that he be empowered to appoint an advisory committee composed of members from throughout the state from related scientific and technical fields, industry, farming or ranching, etc. No specific size of advisory board is recommended because the Committee believed this should be left to the discretion of the Director.

Research and commercial programs. During the Committee's hearings the Committee's advisors, scientists, weather modifiers, and others consistently noted that a distinction should be made between so-called research projects -- both pure research (laboratory) and applied research (pilot field projects) -- the commercial weather modification operations. This the Committee agreed should be done. In addition, the Committee suggests that the Director be given enough latitude to adopt flexible requirements for operational controls for research oriented programs.

Operator's licenses and permits for specific programs.

Another suggestion adopted by the Committee was to distinguish between the licensing of operators and the approval of weather modification projects. That is, the Committee believes that in addition to licensing each operator, the Director should be given the power to approve each weather modification program separately, establish basic criteria under which it will be conducted, and limit it to a specific geographical area and a specific length of time. One of the problems which might be prevented by such a permit system (one which has not at this time apparently been a major problem but one which may become so at a later date) is that overlapping or conflicting projects could be prevented from being initiated within the same geographical area.

Public hearings and reporting requirements. The Committee also suggests that the Director establish as extensive a reporting requirement as he desires, using recommendations of the aforementioned advisory committee; require notice of each proposed project to be published within the county or counties in which the project would be conducted; and, require public hearings to be held within the area of a proposed project before the project is given an operating permit.

Finally, the Committee does not agree with the proposals which suggest that all programs be stopped (weather modification programs be outlawed) or that such programs be allowed only on alternate years. Instead, the Committee firmly agrees that it should be the policy of the State of Colorado to encourage weather modification programs -- both research and commercial. Such programs should, however, be operated only within specific guidelines and should be conceived to provide definite benefits to the people of the state or to advance scientific knowledge.

Summary of the Proposed Weather Modification Control Act

To meet these goals, the Committee herein presents a suggested bill for consideration by the 1972 General Assembly. The Committee also asks that the Legislative Council recommend that this bill be added as an item on the Governor's agenda for the 1972 General Assembly's consideration.

In brief, this proposed bill:

(1) Clarifies the powers and responsibilities the Director of the Department of Natural Resources has over weather modification operations in Colorado;

(2) Establishes an advisory committee to assist the Director in developing licensing standards, and evaluating proposed projects, and to sit as a fact finding review body when damages are claimed as a result of weather modification operations, or when the conduct of an operation is challenged;

(3) Requires all weather modifiers to obtain a license and a permit before a project may be started;

(4) Establishes guidelines which the Director must consider before a permit for any weather modification operation can be issued;

(5) Requires publication of a proposed operation in the area affected and it requires that a public hearing be held before operational permits can be approved;

(6) Empowers the director to set specific operational requirements (limitations) for each operation and grants him the authority to modify or suspend the permit if there appears to be any violation of the original operational requirements or any danger to health, safety, or the environment;

(7) Strengthens the powers of the Director to suspend and cancel any weather modification project; and

(8) Recommends that the act become effective upon its passage by the General Assembly and that eighteen thousand dollars (\$18,000) be appropriated to the director to administer the act. The \$18,000 is recommended based on a \$18,000 annual appropriation; the additional \$3,000 is included to allow immediate implementation of the act during the time between passage and the beginning of the 1972 fiscal year.

TEXT

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A BILL FOR AN ACT
CONCERNING THE REGULATION OF WEATHER MODIFICATION, AND MAKING AN
APPROPRIATION THEREFOR.

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. Article 1 of Chapter 151, Colorado Revised Statutes
1963, is REPEALED AND REENACTED, WITH AMENDMENTS, to read:

ARTICLE 1

WEATHER MODIFICATION

151-1-1. Short title. This article shall be known and may be
cited as the "Weather Modification Act of 1972".

151-1-2. Declaration of purpose. The general assembly hereby
declares that the state of Colorado recognizes that economic benefits
can be derived for the people of the state from weather modification.
Operations, research, experimentation, and development in the field of
weather modification shall therefore be encouraged. In order to
minimize possible adverse effects, weather modification activities
shall be carried on with proper safeguards, and accurate information
concerning such activities shall be made available for purposes of

Section 1. The bill repeals and re-enacts
Colorado's current Weather Modification Control
Act -- Chapter 151-1-1, et seq.

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regulation. The general assembly further recognizes the part played to this time by various governmental agencies in the research and development of weather modification, but declares that the performance of weather modification is more properly a commercial activity to be carried out, whenever practicable, by private contractors.

151-1-3. Declaration of rights. The general assembly hereby declares that the state of Colorado claims the right to all moisture suspended in the atmosphere which falls or is artificially induced to fall within its borders. Said moisture is hereby declared to be the property of the people of this state, dedicated to their use subject to distribution and use in accordance with law. It is further declared that the state of Colorado also claims the prior right to increase precipitation by artificial means for use in Colorado. As incident thereto, it shall be the policy of this state to integrate the administration and use of such moisture with the use of surface and ground water in such a way as to maximize the beneficial use of all the waters of this state.

151-1-4. Definitions. (1) As used in this article unless the context otherwise requires:

(2) "Director" means the executive director of the department of

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151-1-3. By declaring that any moisture which falls naturally or falls as a result of a weather modification project is the property of the people of the state, the Committee attempts to resolve such questions as: 1) How is any additional water which results from weather modification programs to be administered? 2) Who owns such water? 3) Does the modifier have a priority claim to such water?

The Committee believed that the best solution would be to simply administer such water under existing law. Thus a modifier's claim would depend on the priority of appropriation.

151-1-14. Definitional distinctions are made between "research" and "commercial" operations and between a weather modification "license" and a "permit" to conduct a weather modification operation. Note also that publications

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natural resources, as created by article 15 of chapter 3, C.R.S. 1963.

(3) "Advisory committee" or "committee" means the advisory committee appointed pursuant to this article.

(4) "Weather modification" means any program, operation, or experiment intended to induce changes in the composition, behavior, or dynamics of the atmosphere by artificial means.

(5) "Operation" means the performance of any weather modification activity initiated to produce or to attempt to produce a certain modifying effect upon the weather in any form within one specified geographical area over a specified continuing time period.

(6) "Research and development" means theoretical analysis, exploration, experimentation, and the extension of investigative findings and theories of a scientific or technical nature into practical application for experimentation and demonstration purposes, including the experimental production and testing of models, devices, equipment, materials, and processes both in the laboratory and in the atmosphere.

(7) "Research and development operation", or "research and development project", means an operation which is conducted solely to advance scientific and technical knowledge in weather modification.

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may be supplemented by radio and television announcements. However, such broadcasts cannot be used to replace formal published notices and must make reference to the location of the formal published notice.

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Research and development operations may be conducted by state or federal agencies, institutions of higher learning and bona fide nonprofit research corporations, or by commercial operators under contracts with such entities solely for research purposes.

(8) "Commercial operation" or "commercial project" means any person or corporation attempting to modify the weather in any manner, by contract or otherwise, in order to make a profit. A commercial operator is one who engages in such activities for profit.

(9) "License" means a certification issued by the director indicating that a specific person has met the standards for certification as a weather modifier and is approved to direct weather modification operations in the state.

(10) "Permit" means a certification of project approval to conduct a specific weather modification operation within the state under certain conditions and within the limitations required and established under the provisions of this article.

(11) "Publication" or "publish" means at least one publication in at least one newspaper of general circulation in the county or counties, or portions thereof, included within the proposed operation. If there is no such newspaper, publication shall be by posting in at

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least three public places within the county or counties, or portions thereof, included within a proposed operation. All publications provided for in this article may be augmented, at the discretion of the director, by notices broadcast over any or all standard radio, FM radio, television stations, and cable television. Such broadcast notices shall make reference to locations or publications wherein details of the subject matter of the notices are located.

151-1-5. Administration. (1) The director of the department of natural resources is hereby charged with the administration of this article.

(2) The director shall issue all licenses and permits provided for in this article under the rules and regulations established by him, and he is hereby authorized and directed to execute and administer all other provisions of this article pursuant to the powers and limitations contained herein.

151-1-6. Advisory committee - appointment - duties. (1) The director shall appoint an advisory committee, and may designate subcommittees thereof, to assist him in developing licensing standards and report forms, in conducting studies, in establishing minimum operation requirements and to advise him on such other technical and

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151-1-5. The Director of the State Department of Natural Resources is charged, as he is under current law, with administering this act. The Committee considered assigning this responsibility to either an independent board or to the Water Conservation Board; but, this would reverse past attempts to keep the number of boards to a minimum.

151-1-6. In order to obtain some of the advantages which an impartial board might provide, the Committee agreed to require the Director to appoint an advisory committee. For the most part, the advisory committee is empowered to do just that -- advise the Director. However, in subsection (2), the committee is granted a special power -- to sit as a quasi-judicial fact finding body when controversies arise as a re-

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general matters as he shall direct. In appointing such committee, the director shall consider including, but is not limited to, persons actually engaged in farming or ranching and persons with appropriate scientific, technical, industrial, and water resource background, and he shall consider, in making said appointments, the diverse geographical interests of the state.

(2) (a) Whenever any person shall file a verified complaint alleging substantial damages as a result of willful or negligent misconduct of an operation or that an operation is being conducted in violation of the requirements of a permit or in violation of this article, the director shall convene the advisory committee, which shall investigate the complaint and shall conduct a hearing and issue a decision in accordance with article 16 of chapter 3, C.R.S. 1963. Such decision shall not include any determination as to the amount of damages, if any.

(b) The record of the hearing, including all evidence, exhibits, and other papers presented or considered, together with all findings of fact and conclusions of law, shall be available to any party in interest for use in any action for judicial review or a trial for damages.

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sult of weather modification activities.

Under subsection 2, the Director can convene the advisory committee to hear and determine the facts of any complaint. In such a capacity, the advisory committee would provide the first level of adjudication on issues arising as a result of weather modification activities. Hopefully, the board would provide an impartial analysis of all issues and facts arising from a weather modification activity. If a court case resulted subsequent to the board's review of the facts, the courts would have the board's findings available. Of course, the board's findings and the facts presented, could still be reviewed and challenged.

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(3) Members of the advisory committee shall not be paid for their services but they may be reimbursed for any actual and necessary expenses they incur in the performance of their duties.

151-1-7. Duties of the director. (1) The director shall establish rules and regulations, in accordance with article 16 of chapter 3, C.R.S. 1963, necessary to effectuate the purposes of this article.

(2) The director shall establish qualifications, procedures, and conditions, for the issuance of licenses for the purpose of conducting weather modification activities within the state. Such qualifications, procedures, and conditions shall be developed in consultation with the advisory committee appointed pursuant to section 151-1-6. The qualifications so established for licenses shall be such as to be reasonably consistent with the qualifications currently recognized by national or international professional and scientific associations concerned with weather modification and meteorology.

151-1-8. Powers of the director. (1) The director may issue permits applicable to specific weather modification operations. Said permit shall describe the specific area and establish a specific time interval for each operation. A separate permit shall be required for

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151-1-7. (1) Reference is to the Administrative Code -- specifically to "Administrative Rule Making and Licensing Procedures by State Agencies".

151-1-7 (2) and 151-1-8 (1). In order to assure that the state retains adequate control over each weather modification project, and to assure that weather modification projects would be conducted only by qualified professional operators, the Committee makes a distinction between a "license" and an "operational permit". A license would be issued to anyone who meets qualifications as a weather modifier. The Committee language provides only broad statutory guidelines for licensing standards; the actual specifications for a license are to be developed by the Director and set forth in administrative regulations.

A permit, on the other hand, would be issued for a specified weather modification project. The Committee, again, recognized a need to allow the Director fairly broad powers to approve or reject specific projects. It did, however, attempt to develop more statutory guidelines (procedures and limitations) for the permits than it did for licenses. Incidentally, if these guidelines are adopted, Colorado will be one of the

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each operation. The director shall issue a permit only after it is established that the project is conceived to provide economic benefits, or that it will advance or enhance scientific knowledge. The director shall issue only one active permit at a time for activities in any geographic area if two or more projects might adversely interfere with each other. The director may ask the advisory committee to review each request for a permit and offer him its advice on issuance. The director shall not be bound by such advice.

(2) The director may, by regulation or order, establish any standards and instructions to govern the carrying out of research and development or commercial operations in weather modification that he considers necessary or desirable to minimize danger to land, health, safety, people, property, or the environment.

(3) (a) The director may make any studies or investigations, obtain any information, and hold any hearings he considers necessary or proper to assist him in exercising his power or administering or enforcing this article or any regulations or orders issued under this article.

(b) All hearings conducted under this article shall be conducted

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first states, if not the first state, to establish criteria by statute. The abovementioned guidelines are found in section 151-1-12, page 12.

Subsections (2) through (7) list the powers granted to the Director. Most of these are self explanatory. Of specific interest may be subsection (4) (b), which includes a sentence authorizing local governments and other public agencies, e.g., counties, municipalities, water conservancy districts, etc., to help finance and participate in weather modification activities. The Committee believes, such entities already have this authority but a clear declaration of such authority might be helpful.

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pursuant to the provisions of this article and article 16 of chapter 3, C.R.S. 1963.

(4) (a) The director may, upon approval of the governor, represent the state in matters pertaining to plans, procedures, or negotiations for interstate compacts relating to weather modification, but, before any such compacts may be implemented, the consent of the general assembly must be obtained.

(b) The director may represent the state, and assist counties, municipalities, and public agencies in contracting with commercial operators for the performance of weather modification or cloud-seeding operations. Counties, municipalities and other public agencies of this state are hereby granted the authority to contribute to and participate in weather modification.

(5) (a) In order to assist in expanding the theoretical and practical knowledge of weather modification the director may participate in and promote continuous research and development in:

(b) The theory and development of weather modification, including processes, materials, ecological effects, and devices related to these questions.

(c) The utilization of weather modification for agricultural,

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industrial, commercial, municipal or recreational, and other purposes.

(d) The protection of life and property and the environment during research and operational activities.

(6) The director may conduct and may contract for research and development activities relating to the purposes of this article.

(7) The director, subject to limits of the department of natural resources' appropriation, may hire any technical or scientific experts or any staff deemed necessary to carry out the provisions of this article.

(8) (a) Subject to any limitations imposed by law, the department of natural resources, acting through the director, may accept federal grants, private gifts, and donations from any other source. Unless the use of the money is restricted, or subject to any limitations provided by law, the director may:

(b) (i) Spend it for the administration of this article;

(ii) May, by grant, contract, or cooperative arrangement, use the money to encourage research and development by a public or private agency; or

(iii) May use the money to contract for weather modification operations.

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151-1-9. License and permit required - exemptions. (1) No person, persons or corporations may engage in activities for weather modification and control without a weather modification license and a weather modification permit issued by the director; nor may they engage in any activities in violation of any term or condition of the license or the permit.

(2) (a) The director, to the extent he considers exemptions practical, may provide by regulation for exempting the following activities from the fee requirements of this chapter:

(b) Research, development, and experiments conducted by state and federal agencies, institutions of higher learning, and bona fide nonprofit research organizations;

(c) Laboratory research and experiments; and

(d) Activities of an emergency nature for protection against fire, frost, hail, sleet, smog, fog, or drought.

151-1-10. Issuance of license. (1) (a) The director, in accordance with his regulations, shall issue a weather modification license to each applicant who:

(b) Pays the license fee, if applicable; and

(c) Meets the qualifications for licensure established by the

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151-1-9. The Committee, following the Texas law, recommends that the operator obtain a weather modification license as well as an operational permit before commencing any weather control activity. Government, university, nonprofit research operations, and operations conducted to meet emergency situations -- drought, fire, fog, etc. -- may, at the discretion of the Director, be exempted from paying the required license and permit fees.

151-1-10. Licenses shall be issued to any person who meets the basic qualifications established by the Director and pays the requisite fee. Again, the Committee assumes this will become essentially a non-discretionary routine administrative function. Of course, the Director can deny a license if the person does not clearly meet the established qualifications.

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director pursuant to section 151-1-7 (2) of this article; and

(d) Demonstrates, to the satisfaction of the director, financial responsibility.

(2) If the applicant is a corporation or an organization, the qualifications for license must be demonstrated by the individual or individuals who are to be in control and in charge of the operation for the applicant.

(3) If any of the above provisions are not met, to the satisfaction of the director, by the person applying for a license under this article, the director shall deny the application for license.

151-1-11. License fee - expiration. A license shall be issued hereunder only upon the payment to the state of Colorado the sum of five hundred dollars for such license. Each such license shall expire at the end of the calendar year in which it shall be issued.

151-1-12. Permit required - when issued. (1) (a) The director, in accordance with his regulations, shall issue a weather modification permit to each applicant who:

(b) Holds, or if the applicant is a corporation, demonstrates that the person or persons in control of the project holds a valid

151-1-11. The Committee recommends increasing the annual fee for a weather modification license from \$100 (under existing statutes) to \$500. Each license would expire at the end of the calendar year in which it was issued.

151-1-12. In this section, the Committee attempted to spell out some basic procedures, limitations and requirements on the issuance of a permit to conduct any weather modification project. Particularly important are sections which require: 1) proof of financial responsibility; 2) proof that the project should provide a specific benefit; 3) clearly defined geographical limits; 4) publication of notice of the

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weather modification license;

(c) Pays the permit fee, if applicable;

(d) Furnishes proof of financial responsibility adequate to meet obligations reasonably likely to be attached to or result from the proposed weather modification operation. Such proof of financial responsibility may, but at the discretion of the director shall not be required to, be shown by presentation of proof of a prepaid, noncancellable insurance policy against such liabilities in an amount set by the director, or by filing with the director an individual, schedule, blanket, or other corporate surety bond in an amount approved by the director.

(e) Submits a complete operational plan for each proposed project prepared by the licensed operator in control which includes a specific statement of objectives, a map of the proposed operating area which specifies the primary target area and shows the area reasonably expected to be affected, the name and address of the licensee, the nature and object of the intended operation, the person or organization on whose behalf it is to be conducted, a statement showing any expected effect upon the environment and methods of determining and evaluating the same, and such other detailed

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intended project and a public hearing thereon before commencing operation; and 5) basic standards (subsection 3) which the Director must use in evaluating a project before a permit can be issued. (See the Comments on sections 151-1-7 and 151-1-8, page 7.)

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information as may be required to describe the operation and its proposed method of evaluation. This operational plan shall be placed on file with the director and with any other agent as he may require.

(f) Publishes a notice of intent to modify weather in the counties to be affected by the weather modification program before the licensee secures a permit and before beginning operations. The published notice shall designate the primary target area and indicate the general area which might be affected. It shall also indicate the expected duration, and intended effect and state that complete details are available on request from the licensee or the director or from the other agent specified by the director. The publication shall also specify a time and place, not more than one week following the completion of publication for a hearing on the proposed project. Proof of publication shall be furnished to the director by the licensee.

(g) Receives approval under the criteria set forth in subsection (3) of this section.

(2) Before a permit may be issued, the director, or his authorized agents shall hold a public hearing on the proposed project. Said hearing shall be held in a place or places within a reasonable

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proximity of the area expected to be affected by the proposed operation.

(3) (a) No permit may be issued unless the director determines, based on the information provided in the operational plan and on the testimony provided at the public hearing:

(b) That, if it is a commercial project, the proposed weather modification operation is conceived to provide, and offers promise of providing, an economic benefit to the area in which the operation will be conducted;

(c) That the project is reasonably expected to benefit the people in said area or benefit the people of the state of Colorado;

(d) That the project is, if it is a commercial project, scientifically and technically feasible;

(e) That the project is, if it is a scientific or research project, designed to and offers promise of expanding the knowledge and the technology of weather modification;

(f) That the project does not involve a high degree of risk of substantial harm to land, people, health, safety, property, or the environment;

(g) That the project is designed to include adequate safeguards

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to prevent substantial damage to land, people, health, safety or to the environment;

(h) That the project will not adversely affect another project; and

(i) That the project is designed to minimize risk and maximize scientific gains or economic benefits to the residents of the area or the state.

151-1-13. Permit fee. The fee for each permit or the renewal thereof under section 151-1-14 shall be at a minimum one hundred dollars. If the operation is a commercial project an additional amount equal to two percent of the value of the contract for a commercial operation, shall be required and paid before a permit may be issued. Said fees are intended to provide at least a portion of the moneys necessary to administer this article.

151-1-14. Limits of permit. (1) A separate permit is required annually for each operation. If an operation is to be conducted under contract, a permit is required for each separate contract. Subject to the provisions of subsection (2) of this section, a permit may be granted for more than one year's duration.

(2) The director may conditionally approve a project for a

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151-1-13. The Committee recommends that the minimum fee for an operational permit be \$100. For commercial projects, the Committee recommends the fee include an additional amount equal to two percent of the contract value of the project. This is not intended to be a tax; it is simply a fee for administrative services. The moneys are intended to offset the amount needed to administer the article.

151-1-14. This section allows the Director to conditionally approve a multi-year project. (An example of such a project is the five-year National Hail Research Experiment currently under way in northeastern Colorado which is being conducted under the auspices of the National Center for Atmospheric Research.) Even when a multi-year project is approved, it must obtain the annual operational permit. In such instances, multi-year commercial projects may

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continuous time period in excess of one year's duration. Permits for such operations must be renewed annually. In approving the renewal of a permit for a continuous program, the director may waive the procedures for initial issuance of a permit in section 151-1-12 and, upon his review and approval of the project's operational record, or, if at his request, the advisory committee reviews and subsequently approves the project's operational record, he may issue a renewed permit for the operation to continue. In such instances, the fees, based upon the value of the contract pursuant to section 151-1-13 may be prorated and paid on an annual basis.

(3) A project permit may be granted by the director without prior publication of notice by the licensee in cases of fire, frost, hail, sleet, smog, fog, drought or other emergency. In such cases, publication of notice shall be performed as soon as possible and shall not be subject to the time limits specified in this chapter or in article 16 of chapter 3, C.R.S. 1963.

151-1-15. Modification of permit. (1) (a) The director may revise the terms and conditions of a permit if:

(b) The licensee is first given notice and a reasonable opportunity for a hearing on the need for a revision; and

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prorate and pay a portion of the required two-percent fee, annually.

(3) Allows exemption of the publication requirements in certain emergency situations.

115-1-15. The law currently lacks clear administrative authority to stop or curtail ongoing programs. Even though injunctive relief may be sought through the courts, the Committee believed that, particularly in emergency situations, this remedy would be inadequate. As a result, this section grants the Director broad

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(c) It appears to the director that a revision is necessary to protect the health or property of any person or to protect the environment.

(2) If it appears to the director that an emergency situation exists or is impending which could endanger life, property, or the environment, he may, without prior notice or a hearing, immediately modify the conditions of a permit, or order temporary suspension of the permit on his own order. The issuance of such order shall include notice of a hearing to be held within ten days thereafter on the question of permanently modifying the conditions or continuing the suspension of the permit. Failure to comply with an order temporarily suspending an operation or modifying the conditions of a permit shall be grounds for immediate revocation of the permit and of the operator's license.

(3) It shall be the responsibility of the licensee conducting any operation to notify the director of any emergency which can reasonably be foreseen, or of any existing emergency situations in subsection (2) of this section which might in any way be caused or affected by the weather modification operation. Failure by the licensee to so notify the director of any such existing emergency, or

powers to modify or suspend weather modification programs.

Note also that the weather modifier is charged with a responsibility of notifying the Director of possible emergency situations.

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any impending emergency which should have been foreseen, may be grounds, at the discretion of the director, for revocation of the license and revocation of the permit for operation.

151-1-16. Scope of activity. Once a permit is issued, the licensee shall confine his activities within the limits of time and area specified in the permit, except to the extent that the limits are modified by the director. He shall also comply with any terms and conditions of the permit as originally issued or as subsequently modified by the director.

151-1-17. Reports of licensee. (1) In order to aid in research and development in weather modification and to aid in the protection of life and property, and the environment, any person, persons, or corporation conducting any weather modification operation in Colorado or elsewhere by undertaking operations within Colorado, shall file such reports at such time or times and in the manner and form as may be required by regulation of the director.

(2) Report forms may be developed by the director on the advice of the advisory committee and shall include basic records showing; the method employed, the type of equipment used, the kind and amount of each material used, the times and places the equipment is operated,

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151-1-17. Weather modification is still essentially a new science. As such, a key to adequate regulation will be the development and analysis of project reports. This section was inserted by the Committee to insure that adequate reports are formulated. Such reports should: provide the Director (and his advisory committee) with adequate means of monitoring an operation; help assure the modifier that his operation is adequately evaluated; and provide that materials which could be used to counter (or support) claims of improper operations are on file.

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the name and address of each individual, other than the licensee, who participates or assists in the operation, any environmental effects realized or suspected to have occurred, and any other necessary data he may require.

(3) The director shall require written reports covering all operations to be made at specific intervals established by him, but said intervals cannot exceed one month.

151-1-18. Operations affecting weather in other states. Weather control operations may not be carried on in Colorado for the purpose of affecting weather in any other state which prohibits such operations to be carried on in that state for the benefit of Colorado or its inhabitants.

151-1-19. Suspension - revocation - refusal to renew. (1) The director may suspend or revoke a license or permit if it appears that the licensee no longer has the qualifications necessary for the issuance of an original license or permit; or has violated any provision of this article.

(2) The director may refuse to renew the license of, or to issue another permit to, any applicant who has failed to comply with any provision of this article.

151-1-18. This declaration was taken directly from current Colorado law.

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151-1-20. Hearing required. (1) Except as provided in section 151-1-15, the director may not suspend or revoke a license or permit without first giving the licensee notice and a reasonable opportunity to be heard with respect to the grounds for his proposed action.

(2) Said hearing shall be conducted by the advisory committee in the manner provided in section 151-1-6 (2).

151-1-21. Immunity of state. The state or any of its agencies or the officers or employees thereof, or any county or municipality or other public agency of the state, are immune from liability resulting from any weather modification operations approved or conducted by them under the provisions and limitations of this article.

151-1-22. Legal recourse - liability - damages. (1) An operation conducted under the license and permit requirements of this article is not an ultrahazardous activity which makes the operators subject to liability without fault.

(2) The mere dissemination of materials and substances into the atmosphere pursuant to an authorized project shall not give rise to the contention or concept that such use of the atmosphere constitutes trespass or involves an actionable or enjoinable public or private nuisance.

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151-1-20. The reference in subsection (2) is to the section empowering the advisory committee to sit as a quasi-judicial fact finding body. (See also the explanation on section 151-1-6, page 5.)

151-1-22. This section attempts to establish a basic state policy governing liability of weather modification activities. Perhaps, the Committee's approach can best be summarized by a statement made in The Legal Implications of Atmospheric Water Resources Development and Management, Weather Modification Project Law Staff, University of Arizona, College of Law (1969), page 124. According to that report:

"Weather modifier liabilities have had but scant legislative attention. In the opinion of some persons, the uncertainty of modifiers as to their legal position has inhibited development of the science. There is a new need for statutory provisions concerning legal liability for

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(3) Except as provided in section 151-1-21, nothing in this article shall prevent any person or persons adversely affected by a weather modification operation from recovering damages resulting from intentional harmful actions or negligent conduct on the part of a licensee, organization, or corporation.

(4) (a) Failure to obtain a license or permit before conducting an operation, or any actions which knowingly constitute a violation of the conditions of a permit, shall constitute negligence per se.

(b) The director may order any person, persons, or corporation who is found to be conducting a weather modification operation without a license and permit to cease and desist from said operation. Failure to obey said order shall constitute a misdemeanor and is punishable as provided in section 151-1-25.

151-1-23. License or permit as defense of actions. The fact that a person, or persons, holds a license or was issued a permit under this article, or that he has complied with the requirements established by the director pursuant to this article, is not admissible as a defense in actions for damages or injunctive relief brought against him.

151-1-24. Judicial review. Judicial review of any action of the

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losses caused by cloud seeding. The Texas* provision ruling out strict liability for licensed operations is sound; the Pennsylvania imposition of liability without fault is a reflection of animus toward weather modification in that state and is unsound. Modifiers should be legally responsible for damages proximately caused by their negligence. Some standards of care set by administrative agencies knowledgeable in the field would help here. There should be legislation striking any notion of trespass liability merely for invasion of the atmosphere by delivery systems, seeding substances, or precipitation."

*The Texas law declares that weather modification is not an ultrahazardous activity. In brief, anyone who engages in an activity deemed to be "ultrahazardous" -- another term used is "abnormally dangerous" -- is strictly liable for damages resulting from his activities even if he is without fault and has taken every conceivable precaution. The Committee believed that weather modification activities should not be placed in such a category.

151-1-23. The Committee also concluded that the mere fact that a person had obtained a license and a permit should not be allowed as a defense against claims for damages resulting from negligence.

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director, or findings of the advisory committee may be had in accordance with the provisions of section 3-16-5, C.R.S. 1963.

151-1-25. Penalty. Any person, persons, or corporation conducting a weather modification operation without first having procured a license and permit, or who shall make a false statement in the application for a license or permit, or who shall fail to file any report or reports as required by this article, or who shall conduct any weather modification operation after revocation of a license or denial, revocation, modification, or temporary suspension of a permit for operation, or who shall violate any other provisions of this article, shall be guilty of a misdemeanor, and upon conviction, if a person, shall be fined not more than one thousand dollars or imprisoned not more than sixty days, or both; and, if a corporation, shall be fined not more than one thousand dollars. Each such violation shall be a separate offense.

151-1-26. Severability clause. If any provision of this article or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions or applications of the article which can be given effect without the invalid provision or application, and to this end the provisions of

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this article are declared to be severable.

SECTION 2. Appropriation. In addition to any appropriation heretofore made for the current fiscal year, there is hereby appropriated out of any moneys in the state treasury not otherwise appropriated, to the department of natural resources, the sum of three thousand dollars (\$3,000), and for the fiscal year beginning July 1, 1972, the sum of fifteen thousand dollars (\$15,000), or so much thereof as may be necessary, for the administration and implementation of this act.

SECTION 3. Safety clause. The general assembly hereby finds, determines, and declares that this act is necessary for the immediate preservation of the public peace, health, and safety.

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Section 2. The recommended appropriation is based on the following estimates:

- 1) Approximate cost of twelve advisory committee meetings and hearings annually (includes mileage, motel, meals, etc.)..... \$ 4,700
 - 2) Approximate cost of an estimated six public hearings for issuance of permits:..... 2,350
 - 3) Approximate annual expenses for court reporters, hearings officers, etc., if needed..... 1,700
 - 4) Annual expenditures covering consulting fees for qualified experts..... 6,250
- \$15,000

The \$15,000 is the estimated cost for a full fiscal year. Because the Committee recommends that this act take effect immediately upon its passage, an additional \$3,000 is recommended for the months of approximately April, May, and June of the 1971-72 (current) fiscal year.