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VICTORIA

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# REPORT

OF THE

## STATE DEVELOPMENT COMMITTEE

ON THE

# MINERAL SPA WATER RESOURCES OF VICTORIA

PRESENTED TO HIS EXCELLENCY THE GOVERNOR IN COUNCIL AND LAID BEFORE BOTH HOUSES OF PARLIAMENT PURSUANT TO THE PROVISIONS OF THE STATE DEVELOPMENT ACT 1958 (No. 6376)

*Ordered by the Legislative Assembly to be printed, 19th June, 1970.*

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# MEMBERS OF THE STATE DEVELOPMENT COMMITTEE

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## LEGISLATIVE COUNCIL—

THE HONORABLE ALEXANDER WILSON KNIGHT.

THE HONORABLE ARTHUR ROBERT MANSELL.

## LEGISLATIVE ASSEMBLY—

REYNOLD ARTHUR CLAREY, Esquire.

WILLIAM PHELAN, Esquire.

SIR EDGAR TANNER, C.B.E., E.D.

RAYMOND JOHN WILTSHIRE, Esquire.

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*Chairman* : REYNOLD ARTHUR CLAREY, Esquire.

*Deputy Chairman* : THE HONORABLE ARTHUR ROBERT MANSELL.

*Secretary* : ALAN NORMAN CASTLE, Esquire.

Public Offices,  
1 Macarthur-street,  
Melbourne, 3002.

## FUNCTIONS OF THE STATE DEVELOPMENT COMMITTEE

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To Inquire into and Report to the Governor in Council upon—

- (a) the balanced economic, industrial, and rural development of the State ;
- (b) the decentralization of industrial activities and the distribution of population in the State ;
- (c) the improvement of the general economic welfare of the State ;
- (d) the amelioration of the conditions of industrial and rural life in the State ;
- (e) the organization and development of primary, secondary, and other industries in the State ;
- (f) any other relevant matters or things.

# REPORT

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To His Excellency Sir Rohan Delacombe, Knight Commander of Our Most Distinguished Order of Saint Michael and Saint George, Knight Commander of Our Most Excellent Order of the British Empire, Companion of Our Most Honorable Order of the Bath, Companion of Our Distinguished Service Order, Knight of the Most Venerable Order of Saint John of Jerusalem, Major-General on the Retired List of Our Army, Governor of Our State of Victoria and its Dependencies in the Commonwealth of Australia, &c., &c., &c.

MAY IT PLEASE YOUR EXCELLENCY :

Pursuant to the State Development Act, the State Development Committee has the honor to submit the following Report on its Inquiry into the Mineral Spa Water Resources of Victoria.

## TERMS OF REFERENCE.

The matters into which it was desired that the Committee should inquire were as follows :—

“ The Mineral Spa Water Resources of Victoria, including :—

- (a) What sources of mineral spa waters exist in the State of Victoria ?
- (b) What are the geological characteristics of the surrounding country ?
- (c) What is the type of each mineral spring, its chemical composition, its rate and temperature of outflow ?
- (d) What is the character of the water and the facilities available for its use ?
- (e) What public reserves have been provided to protect the springs ?
- (f) How are these reserves managed, i.e., by municipal control or other constituted committees of management ?
- (g) Is commercial use being made of the spa waters at present ? If not, is commercial use possible ?
- (h) How best in the public interest should mineral springs be controlled, maintained, developed and promoted, in the future ?
- (i) Any other matters which appear to the Committee to be relevant to the inquiry.”

## CONCLUSIONS.

(1) The study of mineral springs is essentially a study of groundwater and requires investigations of a geological nature.

(2) The available data on mineral springs is incomplete, and very often, outdated.

(3) Deeper and more extensive boring would be necessary to arrive at more accurate estimates of rates of flow.

(4) A reasonable amount of area protection is afforded to mineral springs, by virtue of the fact that some 50 per cent. of the springs issue from areas reserved for public purposes pursuant to Section 14 of the *Land Act* 1958, No. 6284.

(5) Many Committees of Management of areas reserved pursuant to Section 14 of the Land Act have failed to pursue a vigorous policy of improvement and renovation of facilities for the use of mineral waters.

(6) In most cases, the amenities provided by Committees of Management for the use of the waters are archaic, dilapidated, unhygienic and uncomplementary to the environment in which they are situated.

(7) Committees of Management of mineral springs in this State, acting either individually, or in concert, would benefit greatly by maintaining closer contact with controlling bodies of overseas spa resorts, with a view to studying in closer depth what facilities and amenities in use overseas would be suitable to Victorian conditions.

(8) Committees of Management are usually hampered by restricted sources of income, which are generally confined to revenue received by way of car-parking fees.

(9) With one exception, namely, the Donnybrook Mineral Springs Reserve, facilities to use mineral waters on freehold land are minimal.

(10) There is a good deal of confusion as to the names of certain mineral springs, some bearing more than one name, whilst others bear no name at all.

(11) Lack of adequate access routes has contributed, in no small measure, to the decline and, even total disuse, of certain springs.

(12) Comparisons with the scale of development of the mineral waters of countries on the European continent and of Japan, would be invidious, as overseas spa resorts are entirely different in conception, and bodies controlling them enjoy financial and other advantages which are not applicable to Committees of Management in Victoria.

(13) All necessary precautions should be taken to ensure that developed mineral springs, located on either Crown or freehold land, are kept free from pollution.

(14) The Shire of Daylesford and Glenlyon, as the Committee of Management of eight separate reserves, encompassing twenty springs, is confronted with a management problem of some magnitude.

(15) The number of mineral springs available for the use of the public is progressively declining, because of the effect of water supply works, mining and urban development generally.

(16) The existing regulations, made pursuant to Section 218 of the *Land Act* 1958, governing the care, protection and management of Crown reserves from which mineral springs issue, are outmoded and lack uniformity.

(17) The mineral springs, with the highest rates of flow, issue chiefly from Crown reservations.

(18) Committees of Management of areas encompassing mineral springs reserved pursuant to Section 14 of the *Land Act* cannot enter into agreements to commercially use mineral waters without the enactment of special legislation by Parliament.

(19) After examining an opinion given by the Crown Solicitor in relation to the leasing of land under the *Hepburn Springs Land Act* 1959, No. 6517, the Committee believes that the continuation of the tenancy of the company at present occupying portion of the Hepburn Springs Public Reserve is dependent upon the approval of the Governor in Council, given upon the recommendations of the Minister of Lands.

(20) There is scope for further commercial development of mineral waters, within proper legal safeguards, subject to the public interest remaining the paramount concern.

(21) A more equitable system of payment for the right to commercially use mineral waters would be on the lines practised overseas, where, in addition to rental, royalties are often paid by commercial enterprises, according to the volume of production.

(22) Spa therapy is practised extensively in countries on the European continent and also, in other countries, and is supported to some extent or other by local and national government agencies, insurance associations, unions and private corporations, as well as by members of the medical profession.

(23) Medical opinion in Australia does not generally subscribe to claims made that mineral spa waters contain specific curative properties but it is conceded that, in some fields of medicine, particularly the treatment of rheumatic disorders, the use of mineral waters, as part of an extensive physiotherapy régime, and combined with other forms of medical treatment, can have some value.

(24) The successful operation of a spa therapy establishment in Victoria would depend upon the degree of support it received from the medical profession.

(25) The extent of support afforded by the medical profession to a spa therapy establishment would be directly related to the standard and extent of the facilities provided, and any affiliations established with medical research institutions of the highest professional standard.

(26) Unless a spa therapy centre received recognition by way of the acceptance of treatment as being within the ambit of the National Health Scheme, economic considerations would tend to restrict the clientele to the more affluent sections of the community.

(27) The economy of the Daylesford-Hepburn Springs area is essentially geared to the tourist trade, featuring the mineral springs of the area ; but tourist interest in the area is declining due to a variety of reasons, including the lack of modern amenities to cater for tourists, and changes in the pattern of living, in which the motor vehicle prominently figures.

(28) The Daylesford-Hepburn Springs area, by virtue of the volume of mineral waters available and because of the fact that it does have fairly substantial existing facilities (even though out-dated) to accommodate tourists, would be the logical place for any commercial development on the lines of a modern spa therapy centre.

(29) The building of a spa therapy establishment in the Daylesford-Hepburn Springs area would encourage further associated development, such as more sophisticated accommodation and other amenities.

(30) In so far as the statutory aspects of the control and management of reserves encompassing mineral springs are concerned, Sections 221 and 222 of the *Land Act* 1958 provide wide powers to enable reserves to be effectively controlled by Committees of Management.

(31) There has been no co-ordinated approach to the promotion, on a State wide basis, of the mineral spa water resources of Victoria.

(32) Increased promotional efforts to stimulate public interest in the mineral spa waters of Victoria would be unlikely to achieve desired targets, without the simultaneous improvement of the facilities and amenities made available to use the waters.

(33) The successful operation of a spa therapy establishment, similar to those operating in Europe, may well entail promotional efforts directed at securing the support of the medical profession.

(34) When the *Groundwater Act* 1969, No. 7849 comes into operation, the definition of "groundwater" must be held to include all "mineral water" before it reaches the surface.

(35) The *Groundwater Act* 1969, when proclaimed, will influence the control and development of mineral waters, with particular reference to the following aspects :—

- (a) Any artificial alteration of a mineral spring pursuant to Division I., Part III. of the Act could only be undertaken in accordance with a bore construction permit issued by the Minister of Mines.
- (b) By virtue of the operation of Division I., Part V. of the Act, the commercial use of mineral waters transmitted to the surface through a bore could be carried out only as authorized by, and in accordance with, the conditions of a groundwater licence issued by the State Rivers and Water Supply Commission.

#### RECOMMENDATIONS.

(1) That, in cases where mineral springs are located on Crown reserves which have been developed for public patronage, the Mines Department, in association with the local authority, take the necessary measures to update the available data concerning the nature and extent of the mineral water resources.

(2) That, as a prerequisite to any further substantial development of the mineral water resources of any region (especially where commercial exploitation is proposed), a thorough investigation be carried out by the Mines Department, in co-operation with the local authority, to assess the full potential of the area, with particular reference to the maximum rate at which pumping can be sustained without depletion of the aquifer.

(3) That, from the hygienic aspect, pipes and fittings provided to deliver mineral water to the public should be fabricated in non-corrosive materials.

(4) That investigations be carried out by Committee of Management into the desirability and economics of the use of vending machines designed to dispense low-cost containers, such as paper cups, for the use of members of the public wishing to partake of mineral waters.

(5) That the Department of Crown Lands and Survey and the Mines Department confer with Committees of Management, with a view to preparing a complete inventory of names of mineral springs.

(6) That, in a case where a mineral spring located on either Crown or freehold land has been developed for public patronage, the controlling body, or owner of the land (as applicable), be required to clearly and prominently display by notice, of dimensions and in print to be determined, the nature of the chemical constituents of the waters, expressed in parts per million, together with the corresponding chemical symbols.

(7) That mineral waters available for human consumption be tested regularly by a competent authority to ensure that biological disease agents and other pollutants do not exceed levels which would present a danger to public health.

(8) That there be no alienation from the Crown of any reservation, or portion thereof, affording protection to the mineral springs which they encompass.

(9) That, in cases where mineral springs are located on Crown land not reserved for any type of public purpose, the Department of Crown Lands and Survey examine the feasibility and desirability of reserving the areas pursuant to Section 14 of the *Land Act* 1958.

(10) That early action be taken by the Department of Crown Lands and Survey to re-examine regulations made pursuant to Section 218 of the *Land Act* 1958, governing the care, protection and management of reserves encompassing mineral springs, with a view to their uniform amendment in keeping with present day requirements.

(11) That Part 12 of the *Land Act* 1958, comprising Sections 385 to 398 inclusive, which has remained on the statute books for nearly 60 years without being invoked, be immediately repealed.

(12) That, where future commercial development of mineral waters is envisaged, each proposal be treated on its merits, with special legislation being necessary to provide for such development, as has been done in the past.

(13) That any future legislation, authorising the commercial use of mineral waters by private enterprise, be framed so as to provide for associated buildings to be sited on freehold land, and for mineral waters to be conveyed by pipe thereto.

(14) That the *Hepburn Springs Land Act* 1959, No. 6517, be amended so as to include legislative provisions similar to those recommended in (13) above.

(15) That any proposals to secure sole rights to commercially use mineral waters be carefully examined, in the light of the volume of water sought and actual production requirements.

(16) That, in the public interest, the tenure of the company, which is at present occupying portion of the Hepburn Springs Reserve, pursuant to an agreement made under the *Hepburn Springs Land Act* 1959, be extended no longer than is necessary for it to transfer its bottling operations from the public reserve to its adjacent freehold land.

(17) That future agreements entered into involving the commercial use of mineral waters for bottling purposes, be on the basis of the payment of a fixed weekly, or annual rental, plus the payment of royalties according to volume of production.

(18) That practices relating to the marketing of natural mineral waters, and waters purporting to be natural mineral waters, with particular reference to labelling, be regulated so that a clear distinction is made between natural mineral waters and artificially produced waters.

(19) That, in the event that the current proposal to build a spa therapy establishment should fail to eventuate, Government assistance be made available to enable the Shire of Daylesford and Glenlyon to renovate, or rebuild, the public baths within the Hepburn Springs Reserve.

(20) That, if large scale commercial development in the form of a spa therapy centre occurs, the control of the public reserve from which the mineral waters issue be vested in a Committee of Management, which shall include representatives of the respective Government departments and/or authorities concerned.

(21) That, should a modern spa therapy centre be established, some Government assistance be considered in areas of complementary development, e.g., roading.

(22) That the design and siting of any spa therapy establishment be closely examined by the appropriate authorities, to ensure that it does not detract from the environment in which it is situated.

(23) That, when the *Groundwater Act* 1969, No. 7849, comes into operation, the *Mines Act* 1958, No. 6320 be amended so that the reference to "mineral water" as being a "mineral" within the meaning of the Mines Act, be deleted.

(24) That any proposal to build a spa therapy establishment be under the control of the Commission of Public Health.

#### INTRODUCTION.

The control, maintenance, development and promotion of the mineral spa waters of Victoria have been matters of long standing concern.

As far back as 1912, the Australian Natives' Association made representations to the Government with the object of ensuring that the land encompassing the mineral springs of the Daylesford-Hepburn Springs district was not alienated from the Crown. Since then, there is a record of continuous interest being maintained by the Association in the protection and management of the mineral springs of Victoria.

In 1951, this Committee published a report on National Parks, which included certain findings concerning the Central Highlands region, with particular reference to the mineral springs of the area.

In more recent times, approaches have been made to the Government by Municipal and Parliamentary representatives, with a view to having an inquiry carried out into all aspects of the mineral springs of the State.

These events led to the subject of the mineral spa water resources of Victoria being referred by the Premier, Sir Henry Bolte, to the Committee for investigation and report.

## THE INQUIRY.

Inspections were made of Public Reserves and freehold land encompassing the mineral springs of Victoria, so that the facilities and amenities available for their use could be examined.

In view of the great popularity of overseas spa resorts, contact was established and maintained with other countries, particularly those on the European continent, with a view to keeping abreast with the latest trends in the development and utilisation of mineral waters generally.

Sworn evidence was taken from 33 witnesses at Daylesford, Sydney and Melbourne.

## GEOLOGICAL TERMINOLOGY.

Before making reference to specific sources of mineral spring waters in Victoria, it is desirable that a few commonly used terms be considered and defined. This is necessary, as there are many springs throughout the State, but only a small proportion of these could be regarded as mineral springs. The terms of particular interest are as follows :—

### *Mineral springs :*

Mineral springs are either highly mineralized, with salts common in the groundwater of the region, or contain an uncommon salt or salts. Nonmineral springs are usually spoken of as *common springs*. (Tolman, C. F.—Ground Water—McGraw—Hill Book Co. Inc., New York, 1937).

### *Mineral water :*

Water found in nature impregnated with mineral substance, artificial imitation of this, especially soda-water, also other effervescent drink, e.g., ginger beer. (The Concise Oxford Dictionary of Current English—5th Edition, Oxford University Press, 1964).

A natural water coming from a spring and containing some characteristic mineral ingredient as carbon dioxide or a lithium salt. (Rice, C. M.—Dictionary of Geological Terms—Edward Bros. Inc., Ann Arbor, Michigan, 1949).

### *Spa :*

Place where there is a mineral spring (Spa, place in Belgium). (Oxford Dictionary).

### *Spring :*

Place where water or oil wells up from earth, basin so formed, as hot or mineral springs. (Oxford Dictionary).

A place where without the agency of man, water flows from a rock or soil upon the land or into a body of surface water. A point where water or oil emerges from the ground in sufficient quantity to flow away ; as contrasted with seep, from which there is no stream flowing away. (Rice).

A spring is concentrated groundwater flow issuing at the surface as a current of flowing water. A spring, therefore, issues from the outcrop of an aquifer or where an aquifer is overlain by a pervious alluvial or detrital cover. The water of the spring may be supplied by free water moving under the control of the water table slope (water table spring), by confined water rising under hydraulic pressure (artesian spring), or by water forced up from moderate or great depths by other forces than by hydraulic pressure (geysers, volcanic and thermal springs). (Tolman).

Excluding the reference to artificial imitations of mineral waters (Oxford Dictionary), these definitions embrace the geologist's idea of terminology relating to mineral springs and spas. In particular, there is the near essential of the presence of carbon dioxide in the water, as a characteristic of mineral springs. There has perhaps been some confusion in the use of the term "spa" which, as already indicated, is taken from the Belgium town of Spa, near Liege, which became so famous for its mineral springs that health resorts throughout the world have become known as "spas".

## THE EMERGENCE AND DEVELOPMENT OF EUROPEAN SPAS.

Evidence and other accompanying data submitted to the Committee indicates that in the fifth century B.C., baths in mineral and thermal waters were beginning to be used in Greece. The best known were the sulfur thermae in Hypate, Thermopylae, in the Corinth Isthmus and on the islands of Melos and Lesbos.

With the rise of the Roman Empire, many health resorts were used for treatment. The use of baths became highly fashionable, amongst the most popular health resorts being Ischia and Baiae, near Naples, where the bathing establishments were magnificent and the affluent built luxurious villas. There the Emperor Nero bathed, and Hadrian died.

Concurrent with the expansion of the Roman Empire, many baths appeared near thermal and mineral springs, even in barbarian countries occupied by the Roman legions. These baths were numerous in Gaul and in other countries north of the Alps, as well as in North Africa. The majority of baths in the Roman colonies were destroyed during the exodus of the Romans, and were forgotten for centuries.

In the Middle Ages and later, baths were re-established usually at thermal and mineral springs, which once again occupied positions of importance. Public baths developed into social centres, as in the Roman past.

Hygiene declined in the sixteenth and seventeenth centuries, as compared to earlier periods. Water in baths and pools was not clean, and was often dirtied by the patients themselves. In the English town of Bath, there were different prices for bathing, according to the number of days after the pool had been freshly filled.

The development of drinking cures at baths began in the sixteenth century, and they attained such popularity that, within two centuries, they forced bathing into the background.

Early in the nineteenth century, carbonic acid baths were introduced as a new method of therapy for cardiovascular diseases. Natural carbonic acid baths gained such fame that at other spas where there were no natural effervescent springs, the water was artificially charged with carbon dioxide.

At the very end of the nineteenth century, the discovery of radioactivity led to new conclusions in balneotherapy, several new spas for the treatment of rheumatic afflictions with radioactivity being founded.

Although the spas of England have suffered a severe decline, the great spas of Europe have continued to prosper.

In the present day European Spas, mineral waters may be applied in various ways, for example, by drinking, by bathing, or by inhalation, with the aid of a wide range of devices and equipment.

In mineral spa therapy centres today, there has been a considerable shift in emphasis from the older classical insistence on the use of mineral water, to the newer approach of its integration with all other forms of medical treatment.

#### SOURCES OF MINERAL SPA WATERS AND GEOLOGICAL CHARACTERISTICS OF THE COUNTRY SURROUNDING SUCH WATERS.

In considering where mineral springs occur, there should be an appreciation of the place of springs in the hydrologic cycle.

The definition of a spring, according to Tolman, clearly indicates that it should be a concentrated point of outflow of groundwater.

All spring water is derived from some groundwater reservoir, and the spring is the point where the issuing water ceases to be groundwater and becomes surface water.

Springs provide the water supply to enable perennial surface streams to continue to flow during prolonged dry periods.

The majority of springs occur where the ground surface intersects the water table. For this reason, springs are more common in dissected country, where the water table under the land between adjacent streams, rises above the valley floors and slopes towards the valleys. If the valley wall slopes more steeply than the water table and openings in the rock mass connect with the ground surface, a point may exist down the slope, below which groundwater flows out upon the ground.

Less common occurrences of springs may be found where the following geological characteristics are evident :—

- (a) Where a surface stream has, as a result of rejuvenation, incised into alluvial deposits and intersected an aquifer in the form of sand or gravel beds ;
- (b) In the lower slopes of volcanic cones, at the edge of lava flows, or where surface streams have cut down into a lava fields ;
- (c) At the base of dunes resting on an impermeable formation ;
- (d) In the lower parts of steep cliffs formed as a result of marine erosion ;
- (e) Along fault planes at the foot of elevated crustal blocks ;
- (f) Where an intrusive dyke has intersected an aquifer and formed an impermeable barrier ; and
- (g) Depressed areas constituting points of outflow from otherwise confined pressure or artesian aquifers, resulting often in mound springs.

In so far as Victoria is concerned, the overwhelming majority of its some hundred mineral springs are situated in Central Victoria, roughly within a 25-mile radius of the Daylesford–Hepburn Springs area. Approximately 50 per cent. of these springs issue within the boundaries of the Shire of Daylesford and Glenlyon.

With regard to Victorian mineral springs, the following rock characteristics are important :—

- (i) The rocks are of sedimentary origin and are of relatively great antiquity so that, as a result of a long geological history, they are compacted, folded, jointed or cracked, and sometimes fractured by faults. They are usually interbedded slates, sandstones or mudstones. They may be intruded by igneous dykes.

Openings to carry water in this type of rock are predominantly joint planes and fault planes, but some primary porosity (i.e., pore spaces present in the sediments at the time of formation) may remain in the sandstones. A common form of opening is that of fissuring near the crests of anticlines (folded geological structures in which the beds are arched convex-upwards).

Typical mineral springs occurrences are found in the Ordovician and, to a very minor extent, the Silurian rocks.

About half of the known mineral springs in the State issue directly from Ordovician rocks.

Three examples are worthy of mention, the first being Tipperary Spring, (identified as Spring No. 36 in Appendix “A”) which is situated against a dyke in the Ordovician rocks. This dyke probably lacks permeability and thus water from the older rocks moves up a channel beside the dyke.

The second example is that of Coimadai Spring, (identified as Spring No. 74 in Appendix “A”) which will be inundated by Lake Merrimu, where the Ordovician rocks are in contact with Permian glacial deposits which lack permeability because of poor size sorting of constituent particles. The third example, Krambruk Spring, (identified as Spring No. 85 in Appendix “A”) issues from the somewhat younger Lower Cretaceous sediments of the Otway Ranges. In this case, jointing and faulting of mudstones and sandstones is the characteristic feature as the rocks are only slightly folded.

- (ii) The rocks are of sedimentary origin and occur as alluvium of Recent to Pleistocene age in valleys in the older rocks. Being young geologically, primary porosity remains in sands and gravels, and water may move readily through these formations. As these deposits are in close contact with the older rocks on which they rest, they may be pervaded with groundwater moving from the older rocks.

This situation describes the second most common mode of occurrence of mineral springs in Victoria, where water issues from alluvium resting on the Ordovician rocks.

In the case of Joyce’s Creek Spring, (identified as Spring No. 2 in Appendix “A”) which is now inundated by Lake Cairn Curran, the spring occurred in alluvium over basalt.

- (iii) Volcanic rocks, mainly basalt, are characterized by openings consisting of near vertical contraction joints or cracks, formed during cooling of the rocks, or as predominantly horizontal permeable zones at the base of, or between successive lava flows.

A few examples of mineral springs of this type are found in the Pliocene to Pleistocene lavas in Victoria, e.g., Spring No. 3 in the Parish of Emberton and Spring No. 61 in the Parish of Wombat. In these cases the basalts rest on Ordovician sediments.

Spring Nos. 79–82, Clifton Springs, Parish of Bellarine, are a possible example of waters issuing from Lower Tertiary volcanic tuffs (fragmental material ejected from a volcano and deposited as bedded formations over the adjacent countryside).

- (iv) A possible, although not usually expected source of mineral spring waters are the Devonian granites. These rocks are typified by three sets of joints or cracks, two sets vertical and at right angles to each other, and to the third approximately horizontal.

Spring No. 90, being the Dropmore Spring at Caveat and Spring No. 86, the Warby Spring north of Glenrowan are examples, water from the latter possibly passing through outwash material from the up-faulted granite before reaching the surface.

Table 1, immediately following, shows, for reference purposes, the geological time scale, and a comparison with absolute time.

TABLE I.—THE GEOLOGICAL TIME SCALE.

Era.	Period.	Epoch.	Absolute Time (Millions of Years) International Union of Geological Sciences 1966.
Cainozoic	Quarternary	Recent Pleistocene	1.5 ± 0.5
	Tertiary	Pliocene	10 ± 3
		Miocene	25 ± 2
		Oligocene	37 ± 2
		Eocene Paleocene	67 ± 3
Mesozoic	Cretaceous	Upper	100
		Lower	137 ± 5
	Jurassic		195 ± 5
	Triassic		235 ± 10
Palaeozoic	Permian		285 ± 10
	Carboniferous		350 ± 15
	Devonian		405 ± 10
	Silurian		440 ± 10
	Ordovician		500 ± 15
	Cambrian		570 ± 15
Proterozoic	Precambrian		
Archaen			

The geological characteristics of each known mineral spring of Victoria, are shown in Appendix "A". Also shown is the Parish in which each spring is situated.

#### CHEMICAL CONSTITUENTS AND GENERAL CHARACTER OF VICTORIAN MINERAL WATERS.

The evidence submitted to the Committee shows that the available data on mineral springs within the State is by no means exhaustive or complete. Within recent years, the Mines Department has received few inquiries on this subject and, apart from studies made incidental to an investigation of groundwater in the Daylesford-Hepburn Springs district, there has been no demand for detailed investigation of mineral springs in other areas.

Different modes of expression of the chemical composition of Victorian mineral waters have been used since the beginning of the century. The earliest analyses (1887-1903), were expressed either as assumed hypothetical combinations of salts, or as metallic oxides, gases and acids assumed to be present in the water. Later (1910-12), the hypothetical combination only was used, but today such combinations of salts are regarded as somewhat meaningless. During the 1930-50 period, ionic concentrations of radicles as well as hypothetical combinations were quoted but; since then, analyses have generally been expressed as ionic concentrations only.

The chemical analyses of all known mineral springs in Victoria have been recalculated by the Mines Department in the currently used form, so that comparisons between the waters of the various springs may be more readily made. The information so tabulated is presented in Appendix "B", which identifies each separate spring with a number which corresponds to that accorded to it in Appendix "A".

The unit used in the analyses is parts per million (p.p.m.), by weight. In the analysis presented, the various radicles are expressed as chemical symbols, but they are fully identified in the accompanying explanatory memoranda.

In particular, two terms require clarification, one being total hardness and the other pH. The method of expressing total hardness in these analyses is to consider the calcium (Ca) and magnesium (Mg) present to be all calcium, and to express this as calcium carbonate (CaCO<sub>3</sub>) in parts per million.

The concept of pH is somewhat complex, but it may be regarded simply as a measure of acidity, with water in the centre of the scale with a pH of 7, strong acids tending to a pH of 1 and strong alkalis tending to a pH of 14. It is pertinent to mention that the majority of natural waters have a pH in the range of 4.5–8.2 and, in this range, the water may contain the bicarbonate radicle ( $\text{HCO}_3$ ), but the carbonate radicle ( $\text{CO}_3$ ) will be absent. If the pH is greater than 8.2, the carbonate radicle may also be present; but, if the pH is less than 4.5, neither the bicarbonate or carbonate radicles will be present.

In those cases where a particular spring has been given a multiple listing, analyses have been carried out at different periods, for example, analyses of the waters issuing from Spring No. 10 have been taken during the years 1912, 1941, 1961 and 1964. This provides a means of readily ascertaining whether there have been any appreciable changes in the chemical constituents over a period of time.

The 1964 analyses were taken from McLaughlin, R. J. W., and Macumber, Jennifer J.,—Mineral Springs of the Daylesford District—Proceedings of the Royal Society of Victoria, Vol. 81, pp. 143–148. With few exceptions, the other analyses were carried out by the Chemical Laboratory Branch of the Mines Department. Silicon is expressed in Appendix “B” as silica  $\text{SiO}_2$  but it is sometimes expressed as the silicate radicle  $\text{SiO}_3$ . It is not certain in what form it actually occurs in nature, probably partly as colloidal  $\text{SiO}_2$ , and partly as the radicle  $\text{SiO}_3$ . The particular convention adopted makes a slight difference in the computed value of the total dissolved solids.

The typing or classification of mineral spring waters in the past has been on the basis of the hypothetical combination of salts present in the water; but, as this method has serious shortcomings, it is no longer used. A simple method of classification usually selects some single characteristic, e.g. :—

- (a) Epsom spring .. Carrying magnesium and sulphate radicles ;
- (b) Calcareous spring .. precipitating calcium carbonate ;
- (c) Chalybeate spring .. Carrying and usually precipitating iron hydroxide ;
- (d) Soda spring .. .. Carrying sodium and bicarbonate radicles ;
- (e) Carbonated spring .. Giving off carbon dioxide.

In Victoria, the essential constituents of the mineral waters are carbon dioxide, in moderate to high concentration, and sufficient soluble mineral matter to impart a taste. Of the remaining anions, chloride predominates, with sulphate next, whilst amongst the metallic ions (cations) sodium, calcium and magnesium are the most notable. The extent to which the mineral waters are inhibited with the various chemical constituents depends largely upon the nature of the rocks through which the waters flow.

If carbon dioxide were not present, the water would be flat and objectionable to taste, and could be regarded as only of limited value even for stock supply, as the magnesium content may be sufficient to cause scouring in ewes and lambs. Taken in small amounts by human beings, the magnesium content can have a beneficial laxative effect.

The explanation of the abnormally large amounts of carbon dioxide in the mineral waters is still a point of contention. Most writers agree that the water itself is of meteoric\* (\*i.e., that which occurs in, or is derived from the atmosphere, such as rain, snow, &c.) origin, the water having picked up the contained chemical radicles by solution of the rocks through which it has passed, and that the presence of high bicarbonate and carbon dioxide is a result of some other process. One school of thought argues the case of carbon dioxide being added as a result of emanations from the dying stages of recent volcanic activity, whilst another interpretation favours the concept of oxidation by meteoric waters of carbon in the Ordovician shales.

A feature of some of the mineral waters, particularly those of the Daylesford area, is the presence of radium and radon, thought to be a result of the upward diffusion from a granite or carbonaceous slate in which radium and/or thorium is present.

The temperature of most of the mineral waters in Central Victoria is of the order of 54–56° F.

Most of the available information concerning rates of outflow from the respective mineral springs was obtained by the Mines Department about 1929, and may not be indicative of the present situation. For this reason, rates of outflow are not indicated. In any case, artificial changes have been effected at a number of springs and this aspect should be assessed anew in the field.

From the evidence submitted, there seems reason to believe that the outflows from certain springs have varied appreciably from time to time.

Where there is a desire for further development of mineral waters at any of the known localities, greater yields might be obtained from deeper bores fitted with deep well turbines rather than 20-foot bores fitted with semi-rotary hand pumps. Following testing by the Mines Department at Daylesford in 1965, it was estimated by the Department that continuous pumping at rates of the order of 800 gallons per hour would be possible from bores at Sutton Springs and 300 gallons per hour from bores at Central Springs, both these springs being within the Central Lake Public Reserve at Daylesford. Higher total production rates could probably be achieved by drilling additional bores nearby.

The Committee believes that, in cases where mineral springs are located on developed public reserves which are subject to public patronage, the Mines Department, in association with the local authority, should, if there is an absence of reasonably up-to-date technical information concerning the springs, take any necessary measures to up-date the available data concerning the nature and extent of the available mineral resources of the region.

The opinion is also held by the Committee that, as a pre-requisite to any further substantial development of the mineral water resources of any region (especially where commercial exploitation is proposed), a thorough investigation, including pumping tests and further boring, should be carried out by the Mines Department, in co-operation with the local authority, to assess the full potential of the area, with particular reference to the maximum rate at which pumping can be sustained over a protracted period without depletion of the aquifer.

#### FACILITIES AVAILABLE FOR USE OF MINERAL WATERS.

Approximately 50 per cent. of mineral springs are located within public reserves which are under the control of Committees of Management appointed pursuant to Section 221 of the *Land Act* 1958, No. 6284.

However, as the only statutory information required from a Committee of Management under the provisions of the *Land Act* is an annual statement of receipts and expenditure, the only data available from the records of the Department of Crown Lands and Survey, concerning facilities provided for the use of mineral waters, is secondary information obtained incidental to primary information sought from time to time.

Notwithstanding the lack of departmental data, evidence was tendered by municipal and other sources on this subject, whilst physical inspections made by the Committee of many reserves have assisted it to build up a general picture of the facilities available for the use of mineral waters.

It is all too evident to the Committee that, whilst most of the mineral springs are located on public reserves of great natural beauty, in many instances, the amenities provided for their use are either archaic, dilapidated or do not complement the environment in which they are situated.

To elaborate, the facilities available for delivering water to the public could be improved, from the hygienic aspect, by the replacement of galvanised iron pipes and fittings with non-corrosive equipment, fabricated in such materials as plastic, stainless steel or copper. To emphasize this point, a witness submitted tangible evidence of the corrosive effect of mineral waters in the shape of a rusted and holed galvanized iron pipe which had been used to deliver water for drinking purposes.

An example of the type of facilities which should be provided for the conveyance and storage of mineral waters was presented at the Donnybrook Spring (Spring No. 73), where all pipes and fittings are fabricated in minerals not susceptible to corrosion.

At the greater majority of springs, there is no receptacle of any kind provided to enable visitors to drink the waters. If drinking cups were to be provided by Committees of Management, careful consideration would have to be given to the type of drinking containers provided, having regard to the hygienic aspect and bearing in mind the likelihood of malicious damage to the containers by irresponsible elements of the community. In the opinion of the Committee, there is scope for investigation into the desirability and economics of the use of vending machines, designed to dispense low-cost containers such as paper cups, which would not be re-used.

Apart from the Donnybrook Spring, where public patronage is encouraged on a commercial basis, the amenities provided for the use of mineral springs issuing on other freehold land are minimal.

Some mineral springs appear to bear more than one name, whilst others bear no name at all. To avoid future confusion, there appears a need for the Department of Crown Lands and Survey and the Mines Department to confer with the municipalities involved, with a view to preparing a complete inventory of names.

The Committee believes that, in a case where a mineral spring located on either Crown or freehold land has been developed for public patronage, the controlling body, or owner of the land, as applicable, should be required to clearly and prominently display by notice, of dimensions and in print to be determined, the nature of the chemical constituents of the waters, expressed in parts per million, together with the corresponding chemical symbols.

The Committee is conscious that the lack of adequate access, by way of roads or pedestrian paths, has contributed in no small measure to the decline and even total disuse of certain mineral springs. In some instances, the avenues of access originally provided have become overgrown with blackberries and other noxious weeds to such a degree that practical access is virtually impossible. The rehabilitation, where necessary, of access routes, would assist in stimulating interest in mineral springs.

It was submitted to the Committee that Committees of Management of public reserves, endowed with mineral springs, are handicapped by lack of finance in their efforts to improve the facilities and amenities available for the use of mineral waters. This is, of course, a problem which is shared not only by the very limited number of public reserves endowed with mineral springs, but also by the some 10,000 public reserves in existence.

In most cases, the only revenue received is by way of car-parking fees which, in itself, creates a need for the payment of labour to effect the collection of such fees. In some instances, no revenue is received by way of parking fees, as it is considered that the likely revenue from this source would be insufficient to offset the cost of the labour necessary to effect the collection of such fees.

Further evidence was submitted to the Committee by controlling bodies to demonstrate that the revenue received from car-parking fees is usually insufficient to defray the cost of the maintenance of public reserves encompassing mineral springs ; let alone assist to meet the cost of capital works.

Financial assistance by way of grants has, and is being made available by the Tourist Development Authority to Committees of Management for necessary permanent improvements, usually on the basis of \$4 Government to \$1 local contribution. In the case of many Committees of Management, it appears that they have failed to pursue a vigorous policy of sustained improvement of facilities, involving the addition of new amenities, and the renovation of existing facilities. The Vaughan and Glenluce Mineral Springs Committee of Management would be one of the exceptions in this regard.

Generally speaking, the existing facilities available for the use of the mineral spa water resources of Victoria are considered by the Committee to be obsolete, unhygienic, limited in range and, in an aesthetic sense, mainly out of harmony with the natural surroundings in which they are located.

The Committee is of the opinion that comparisons with European or Japanese spa resorts would be invidious, as overseas spa resorts are entirely different in conception, and controlling bodies enjoy financial and other advantages which are not applicable to committees of management in Victoria.

Notwithstanding this, the Committee believes that Committees of Management in this State, acting either individually or in concert, would benefit greatly by maintaining closer contact with controlling bodies of overseas spa resorts, with a view to studying in closer depth what facilities and amenities in use overseas would be complementary to Victorian conditions.

#### POLLUTION.

All necessary precautions should be taken to ensure that mineral springs located on either Crown or freehold land are kept free from pollution.

The evidence indicates that, during 1964, bacterial pollution of the group of mineral springs located within the Hepburn Springs Reserve was detected, the degree of contamination varying from spring to spring. All the springs are situated in the Wild Cat Creek catchment.

Analyses, which were carried out on three different occasions during April and May 1964, revealed the following position :—

- (1) The waters from Wyuna Spring, the spring furthest upstream of the group studied, had consistently high coliform bacterial counts of 50-80 per 100 ml. of water.
- (2) The waters from Locarno Spring had variable counts of coliform bacteria, ranging from 0-25 per 100 ml. of water.
- (3) The waters from the other springs within the Reserve showed either no sign, or very low counts of coliform bacteria.

The coliform bacterial count for the waters issuing from the Wyuna Spring was considered by the Department of Health to be too high for human consumption and accordingly the spring was temporarily closed in the interests of public health.

Quite apart from coliform bacteria, it is possible that other biological disease agents, such as viruses, protozoa and yeasts could be present in mineral waters.

Investigations were subsequently carried out by the Mines Department, in association with representatives of the Department of Health and municipal officers, in an effort to trace the source of the pollution.

Field examination of the Wild Cat Creek catchment did not positively identify the source of the pollution of the Wyuna Spring, although three possibilities presented themselves, viz. :—

- (a) Pollution of the waters as a result of seepage from a septic tank installed in a property some 10 chains distant.
- (b) Pollution as a result of run-off from the Wild Cat Creek catchment, where faecal matter from human beings and animals has been found.
- (c) Pollution as a result of the steel casing, lining the bore of the Wyuna Spring, being perforated by the corrosive action of the mineral waters, thus permitting the entry of pollutants.

This occurrence has been covered in some detail, as it illustrates the potential danger to public health inherent in Government and local government procedures which do not provide for regular monitoring of mineral waters subject to public use.

In the case cited, pollution was not detected as a result of a regular pattern of testing, but as a result of incidental investigations made in connection with the erection of a toilet block within the Hepburn Springs Reserve.

The Committee strongly believes that it is of paramount importance that mineral waters available for human consumption should be tested regularly by a competent authority, to ensure that biological disease agents and other pollutants do not exceed levels which would present a danger to public health.

As previously mentioned when discussing the “ Facilities Available for Use of Mineral Waters ”, (Ref. page 14) the likelihood of pollution occurring could be reduced by local controlling bodies ensuring that all pipes and fittings associated with the delivery of the waters to the point at which they are dispensed are fabricated in non-corrosive materials, thus removing the possibility of such pipes and fittings being holed or perforated to permit the ingress of pollutants.

#### PROVISION AND MANAGEMENT OF PUBLIC RESERVES TO PROTECT MINERAL SPRINGS.

The evidence indicates that in the case of eleven mineral springs, their location could not be accurately determined.

In so far as the remaining 99 mineral springs are concerned, the following information, based on records of the Department of Crown Lands and Survey, is set out, in tabular form, in Appendix “ C ” :—

- (1) The status of the land (where the location is known), from which each mineral spring issues ;
- (2) In the case of Crown land, whether the land concerned is reserved ; and, if so ;
- (3) Whether it is under the control of a Committee of Management ;
- (4) The composition of each Committee of Management.

An analysis of Appendix “ C ”, shows that, of the 99 mineral springs identified therein, 29 flow from freehold land and are controlled by private persons, except in one case where the local municipal council has purchased the freehold land concerned.

Nine springs are within the boundaries of Reserved Forest and are controlled by the Forests Commission, whilst a further 6 springs are now submerged beneath reservoirs.

The remaining 55 springs issue from Crown land and, of these, 44 springs are encompassed within 15 areas reserved pursuant to the provisions of Section 14 of the *Land Act* 1958, which provides for the reservation against sale, leasing or having a licence granted in respect thereof, of Crown land for public purposes and other specified purposes.

In the case of the particular reserve which encompasses the 4 Korweinguboora Springs at Spargo Creek (identified as Spring Nos. 65–68 in Appendix “ C ”) there was once a Committee of Management in control, but public interest has apparently been lost and the appointment of the Committee has lapsed.

Of the remaining 14 reserves (on which are 40 springs), 8 reserves (on which are 20 springs) are under the control of the Daylesford and Glenlyon Shire Council as Committee of Management ; 3 reserves (on which are 7 springs) are under the control of other municipal Councils as Committee of Management ; and 3 reserves (on which are 13 springs) are controlled by Committees of Management otherwise constituted, such as persons nominated at a public meeting convened by the Shire President, or a composite Committee comprising representatives of a municipal Council and the general public. One of the said 13 springs, viz., Johnstones Spring (Identified as Spring No. 87 in Appendix “ C ”) is within the boundaries of the Mt. Richmond National Park and accordingly is under the control of the National Parks Authority.

The Vaughan Springs Mineral Springs Reserve is rather unique in that it is controlled by a Committee of Management, comprising representatives of the Castlemaine City Council, Newstead Shire Council, Castlemaine Tourist Association, Castlemaine and District Chamber of Commerce, Castlemaine Branch of Royal Automobile Club and the citizens of Campbells Creek.

Five springs are on Government road reserves, one of which is controlled by the Country Roads Board, one by the local municipal Council and three under no active control.

Three springs, viz., Spring Nos. 25, 26 and 88A, are on Crown land which is not formally reserved for any purpose, whilst in the case of a further 3 springs, also located on Crown land, there is not sufficient information available concerning their location to determine their status.

Of some significance to the Committee, is the fact that the Council of the Shire of Daylesford and Glenlyon has the responsibility of the management of 8 separate reserves encompassing 20 springs. It thus has a management problem of some magnitude on its hands.

The Committee, after carefully considering all the evidence placed before it, has reached the conclusion that the number of mineral springs available for the use of the public is progressively declining.

To demonstrate this point, it is pertinent to mention that 6 mineral springs, which were formerly subject to public use, are now submerged beneath water storages, other springs have ceased to transmit waters because of the effect of mining activities, whilst urban development has further reduced the number of springs available.

Quite apart from the hand of man, practical access to other springs has been barred by nature, in as much as uncontrolled noxious weeds and scrub have overgrown access routes.

Having regard to this position, the Committee believes that it is most important to ensure that there shall be no alienation from the Crown of any part of any existing reservations which offer area protection to the mineral springs which they encompass.

In the three cases where springs are on Crown land which is not reserved for any public purpose, i.e., Springs 25, 26 and 88A, the Committee feels that the Department of Crown Lands and Survey should examine the feasibility of reserving the areas encompassing the springs to afford "blanket" protection. However, from the meagre information available, the Committee appreciates that there may be physical reasons which would render the implementation of such a proposal undesirable or impracticable.

*Terms of reservations encompassing mineral springs.*

As previously indicated, there are 15 Crown reservations encompassing 44 individual mineral springs.

Most of these reservations provide for either ;

" the preservation of such land and springs thereon and for the recreation convenience and amusement of the people " ; or

" the affording of access to mineral springs and public park ", or simply ;

" the recreation, convenience and amusement of the people ".

Other reservations provide for :—

- (1) Public Park and Gardens ;
- (2) Public Purposes (unstated) ;
- (3) Racing and other purposes of public recreation ;
- (4) Mineral Springs and tourist purposes ;
- (5) Water supply purposes ; and
- (6) A National Park (Mt. Richmond).

*Terms of Regulations under the Land Act governing the administration of reserves encompassing mineral springs.*

Regulations made pursuant to the provisions of Section 218 of the *Land Act* 1958 provide for the care, protection and management of each reserve.

The terms of the regulations follow a fairly uniform pattern for most of their provisions, but vary from one reserve to the other, in so far as they relate to the use of mineral water resources.

Regulations governing the control and use of mineral waters cover the following aspects, viz :—

- (a) Prevention of pollution of mineral springs ;
- (b) Interference with springs, taps, pumps or flow of mineral springs ; and
- (c) Limitation of amount of mineral water which may be removed by one person.

According to evidence submitted to the Committee, many of the existing regulations governing the care, protection and management of reservations encompassing mineral springs are outmoded and reflect a lack of uniformity as between each other. Quite apart from this aspect, some of the individual regulations may be "ultra vires" the Land Act on recent legal interpretations obtained by the Department of Crown Lands and Survey.

In view of all the circumstances, the Committee believes that early action should be taken by the Department of Crown Lands and Survey to re-examine the relevant regulations with a view to their uniform amendment in keeping with present day requirements.

It is appreciated by the Committee that the need to revise regulations made pursuant to Section 218 of the Land Act does not apply only to the relatively small number of mineral spring reserves, but also to the some 9,000 public purpose reservations throughout the State, the management of which is governed by regulations of a like nature.

### PRESENT COMMERCIAL DEVELOPMENT OF MINERAL WATERS AND FUTURE POTENTIAL.

In considering the question of commercial use of mineral waters, it must be borne in mind that the known mineral springs with the highest rates of outflow issue, in general, from areas of Crown land reserved for public purposes pursuant to Section 14 of the *Land Act* 1958, No. 6284.

It becomes necessary therefore, to examine, at some length, legal aspects appertaining thereto.

*Part 12 of the Land Act 1958, No. 6284.*

Part 12 of the *Land Act* 1958, comprising Sections 385 to 398 inclusive, refers to mineral springs on Crown land and within State (Reserved) Forests. This legislation, which was originally enacted in 1912 as the *Mineral Springs Act* 1912, No. 2443, has never been invoked.

When introducing the legislation, the then Minister of Mines stated that the intention of the legislation was to protect some 85 mineral springs then known. The Act was to be administered by the Minister of Forests which, in itself, seems an anomaly.

Briefly, the *Mineral Springs Act* 1912, provided that areas around mineral springs could be reserved under the Act and placed under the control of a Mineral Springs Reserves Committee, which apparently was envisaged would consist of high ranking officers of several Departments, such as Crown Lands and Survey, Forests, Mines and Public Works. It was competent for such a Committee to control the reserves directly, or authorize local Committees for the purpose. The Committee could also make regulations.

In addition, the Act empowered the Mineral Springs Reserves Committee to recommend to the Governor in Council that leases and licences be granted under its provisions for the working of a spring, and for grazing under the Land Act and the Forest Act. The legislation specifically excluded lands reserved at Hepburn Springs which were and still are administered under a special Act, the current legislation being the *Hepburn Springs Land Act* 1959, No. 6517.

Notwithstanding the provisions of the legislation, there is no record of a Mineral Spring Reserves Committee ever having been appointed, nor is there any record of any reserve under the Land Act having been dealt with pursuant to Part 12 of the Land Act (that part of the Land Act now incorporating the provisions of the *Mineral Springs Act* 1912).

The Committee is of the decided opinion that this legislation, which has remained on the statute books for nearly 60 years without being invoked, should be immediately repealed.

*Section 12, Land Act 1958, No. 6284.*

The majority of areas of Crown land encompassing mineral springs are reserved "from sale or from being leased or from having a licence granted in respect thereof" pursuant to this section.

This legislative provision, in effect, makes it "ultra vires" for any Committee of Management of such a reservation to enter into agreements with other parties to commercially develop the mineral waters issuing therefrom. The only way in which this provision can be nullified is by the enactment of special legislation by Parliament giving authority for a particular Committee of Management to enter into agreements to commercially utilise mineral waters.

*Special Legislation Authorizing Committees of Management to Enter into Commercial Agreements.*

Two special Acts of Parliament authorize Committees of Management to enter into agreements to commercially utilize mineral waters. They are as follows :—

(1) *The Hepburn Springs Land Act 1959, No. 6517.*

Section 7 (1) of this Act provides “ Notwithstanding anything in any Act, the Committee of Management may from time to time lease to any person such portion of the land reserved under Section 4 of this Act as the Minister of Lands approves to be used as a site for the working of mineral springs therein and the collection preparation sale and removal of the natural mineral waters thereof ”.

Section 7 (2) provides “ A lease under this section—

- (a) shall be for a term not exceeding 21 years from the time of the grant thereof ;
- (b) shall contain a condition that nothing therein shall be deemed to lessen or interfere with the right of the public to the use of the land adjoining the land leased ; and
- (c) shall be subject to such other conditions and such covenants, exceptions and reservations as are approved by the Governor in Council on the recommendation of the Minister of Lands.”

(2) *The Daylesford Springs Land Act 1966, No. 7396.*

Section 2 of this Act provides—

- (1) “ Notwithstanding anything in any Act but subject to this Act the Council of the Shire of Daylesford and Glenlyon, as the Committee of Management of the land permanently reserved by Order in Council of the 16th day of January, 1934 as a site for mineral springs and an ornamental lake and for the recreation convenience and amusement of the people, may from time to time enter into agreements with any person providing for the taking and removing of natural mineral water from the said land by any person by conducting or pumping it through pipes or otherwise and for or with respect to the sale and preparation for sale for other use of water so taken and notwithstanding any reservation of or regulation relating to the said land any such agreement may be carried into effect ”.
- (2) “ An agreement shall not be entered into under this section except with the approval of the Governor in Council given upon the recommendation of the Minister of Lands and any agreement entered into without such approval shall be void and of no effect ”.
- (3) “ The term for which an agreement under this section may be entered into shall not exceed 21 years from the date of execution of the agreement ”.

*Present Commercial Development of Mineral Waters.*

In this context, the Committee feels that it is desirable to outline the salient points of the legislation governing the commercial use of mineral springs.

The Committee has noted that both the *Hepburn Springs Land Act 1959* and the *Daylesford Springs Land Act 1966* contain an important safeguard against undue commercial exploitation of the mineral waters, to the detriment of the public interest, in as much as the Committee of Management (in each case the Shire of Daylesford and Glenlyon) cannot enter into agreements for the removal and utilization of the waters without the approval of the Governor in Council given upon the recommendation of the Minister of Lands.

Of particular interest to the Committee, is the fact that the *Daylesford Springs Land Act 1966*, has not yet been invoked, although from evidence received, the Committee understands that the company which is already bottling mineral waters on an area within the Hepburn Springs Reserve, has been negotiating with the Shire of Daylesford and Glenlyon, with a view to entering into an agreement to commercially use waters issuing from the Sutton Springs area within the Central Lake Reserve, Daylesford. No such agreement would, of course, be valid, unless it complied with Section 2 (2) of the *Daylesford Land Act* which provides “ An agreement shall not be entered into under this section except with the approval of the Governor in Council given upon the recommendation of the Minister of Lands and any agreement entered into without such approval shall be void and of no effect ”.

In the opinion of the Committee, any proposal to secure sole rights to commercially use mineral waters should be very carefully examined in the light of the volume of water sought and actual production requirements.

An essential difference between the legislation governing the commercial use of water at Hepburn Springs on the one hand, and at Daylesford on the other hand, is the requirement of the latter legislation that the Shire of Daylesford and Glenlyon, as Committee of Management of the Central Lake Reserve, can enter into agreements for the removal of natural mineral water from the said reserve, only by way of conducting it, or pumping it through pipes. Unlike the legislation with respect to the Hepburn Springs Reserve, the *Daylesford Springs Land Act* contains no provision for the erection of commercial buildings within the Central Lake Reserve, Daylesford.

The Committee supports the principle so established, that commercial enterprises wishing to utilize mineral waters for bottling and other purposes, should be required by legislative provision to site any necessary buildings and other improvements on freehold land outside public reserves.

The only commercial development of mineral waters being undertaken on Crown land reserved pursuant to Section 14 of the *Land Act* 1958, is that being carried out on an area of 2 acres 17 perches within the Hepburn Springs Public Reserve, in accordance with a leasing agreement entered between the company concerned and the Shire of Daylesford and Glenlyon, as Committee of Management of the Reserve, pursuant to the *Hepburn Springs Land Act* 1959.

Under the relevant legislation, a lease was granted to a company for a period of 10 years commencing on the 1st January, 1960 ; but, before the expiration of the 10-year period, the lease was assigned to the present lessee.

The commercial development at present being carried out by the company is limited to the bottling and sale of mineral waters. The building in which the waters are bottled is obsolete and, like other structural improvements on the Hepburn Springs Reserve, such as the kiosk and bath house, is in urgent need of renovation or, more preferably, replacement.

From evidence received, it appears that the only other commercial development of mineral waters is by way of the bottling of mineral waters issuing from the Deep or Crystal Spring (identified as Spring No. 38 in Appendix "C"), which is located on freehold land near Eganstown, close to Deep Creek. This enterprise seems to be rather limited in scope.

The owner of the land on which the spring is situated has always insisted that the waters shall not be developed commercially to such an extent that the rights of the general public to use the waters shall be restricted. The provision of improved access to this and other springs in the Eganstown area should result in an increase in their popularity.

#### *Potential for Future Commercial Development.*

According to evidence received, companies other than the company at present bottling waters on the Hepburn Springs Reserve, have shown an interest in the commercial development of the mineral spa water resources of Victoria. To be more explicit, two different companies, one based in Melbourne and the other based in Sydney, have made approaches to the Shire of Daylesford and Glenlyon, with a view to examining the feasibility of the commercial utilization of the waters of the Sutton Springs, which issue within the Central Lake Reserve, Daylesford. Yet another Melbourne bottling firm has evinced a keen interest in the development of portion of the mineral waters issuing within the Boggy Creek Mineral Spring Reserve at Kyneton. (Identified as Springs 10 and 10A in Appendix "C".)

The Committee takes the view that the commercial development of mineral springs should preferably be undertaken by private enterprise. The experiences of the Shire of Daylesford and Glenlyon in conducting public baths on the Hepburn Springs Reserve tend to reinforce this view.

Evidence was submitted by the company bottling waters on the Hepburn Springs Reserve, concerning a proposal under consideration to build a modern spatherapy establishment at a cost of more than \$1,000,000, the centre to be built on an area of some 4½ acres owned by the company adjacent to the Hepburn Springs Reserve. Witnesses representing the company expressed the belief that the proposal was economically feasible, provided that the co-operation and assistance of the Government was forthcoming.

The Committee believes that, in concept, the proposal is feasible, but it is of the opinion that financial backing for such a venture should, in the main, come from private lending sources. However, in other areas of complementary development which might be necessary, e.g., roading, some Government assistance might be warranted.

A desirable feature of the proposed development of a modern spatherapy centre is the implication which it conveys that the company concerned plans to shift its scene of operations from the Hepburn Springs Reserve to its adjacent freehold land.

The Committee is of the opinion that, in the public interest, the company's tenure of portion of the Hepburn Springs Reserve should not be continued longer than is necessary for it to transfer its bottling operations to its adjacent freehold land.

The Committee believes that, where future commercial development is envisaged, each proposal should be treated on its merits, with special legislation being necessary to provide for such development, as has been done in the past.

There are so many variable factors that it would not be possible, in the opinion of the Committee, to draft legislation of a general nature, which would adequately protect the public interest in the mineral springs. This is borne out by the fact that general legislation, viz., Part 12 of the *Land Act* 1958, has already been in existence for nearly 60 years, without being invoked.

The variable factors mentioned above, include—

- (a) The differential rates of flow ;
- (b) The location of the mineral springs to other water resources ;
- (c) The location of the mineral springs to any proposed processing plant ;
- (d) The public demand for the mineral water ;
- (e) The size of the reserve encompassing the springs ; and
- (f) Access to the springs either by road, or by pipe, as applicable.

Leasing agreements entered into with commercial enterprises to utilize mineral waters for bottling purposes have hitherto provided for the payment of a weekly rental fixed upon the signing of the agreement.

A more equitable system of payment for the right to use mineral waters would be on the lines practised overseas, where in addition to rental, royalties are often paid by commercial enterprises according to the volume of production.

In the opinion of the Committee, future commercial agreements entered into, involving the bottling of Victorian mineral waters, should incorporate this principle.

In regard to the sale of mineral waters, the Committee feels that marketing practices should be regulated, with particular reference to labelling which may mislead the public. For example, commercial concerns marketing natural mineral waters, or products purporting to be natural mineral waters, should be required to label their products “artificially produced”, or “natural mineral waters”, as the case may be, in a form which is clear, prominent and readily legible to the consumer. The European Regional Standard for Natural Mineral Waters provides guide lines in this respect, some of which could be translated to Victorian conditions.

In general, the Committee feels that there is scope for further commercial development of mineral waters subject to the public interest remaining the primary concern. Should a modern spatherapy centre be established on the lines of European centres, the measure of its success may well be dependent upon the degree of support it receives from the medical profession. The presence in Victoria of large numbers of people who, by virtue of their origins, are conditioned to the use of mineral waters, could provide the basis for a clientele.

#### SPA THERAPY AS IT IS PRACTISED IN EUROPE TODAY.

Much evidence and authoritative supporting information was placed before the Committee to show the extent to which spa therapy is practised in Europe today. In this regard, the submission tendered by Mr. A. T. Evans, M.P., based on the knowledge which he gained as a result of a study tour of European Spas, was of particular value.

Spa therapy in Europe is represented by several thousands of doctors, many more thousands of therapists and other employees, treating millions of people and representing an investment of billions of dollars. It is supported, to some extent or other, by local and national government agencies, insurance associations, unions and private corporations, as well as by members of the medical profession. Spa doctors are organized in specialized local, national and international associations, whilst spa affiliations include many of the leading European universities, primarily for the purpose of research.

At spa resorts, great attention is paid to the layout of spa gardens and terraces, in close association with town planning schemes.

Every resort takes pride in its special features, e.g., well-kept parks at inland spas, pleasant marine walks at seaside resorts, and modern medical amenities of various forms of baths, pump rooms, hydros, hospitals and nursing homes.

Hotels, restaurants and boarding houses are run on modern lines. They are beautifully equipped, can cater for every class of patient, and offer an excellent cuisine, including special diet for those who need it.

Tariffs at the spas vary, and accommodation is provided for a wide range of income earners.

Most of the spas are open throughout the year, whilst others are open only during the spring, summer and autumn. They are able to treat from several hundred to several thousand patients a day according to the capacity of each establishment. To do this, they maintain an adequate staff of physicians, therapists, nurses and attendants. Each individual spa, whilst interested in treating a variety of ailments, may give special attention to the care of one particular ailment, or group of allied ailments. The greatest percentage of persons attending spa resorts for medical treatment suffer from rheumatic disturbances, whilst cardiovascular complaints are next in incidence.

Persons visiting spas for purely medical reasons are referred by their doctors, who consider spa therapy to be an integrated part of their overall medical care. No patient is treated at these spas without a detailed medical prescription. This rule is rigorously enforced. In accordance with usual practice, the referring doctor informs the spa doctor of the medical history and pertinent findings concerning the patient. In turn, at the end of the course of treatment, the spa doctor reciprocates by returning a report as to his findings, the treatment administered, and the patient's reactions and status at the time of discharge.

Each spa makes a detailed qualitative and quantitative analysis of the mineral and gaseous contents of its mineral waters, as well as its physical properties and temperatures. These may vary not only at different spas, but also from spring to spring at the same spa. The main classifications are the saline, alkaline and mixed waters. The mineral contents include sodium, potassium, calcium, ammonium, magnesium, lithium, iron, chlorides, sulphates and bicarbonates. The gaseous contents are carbon dioxide, hydrogen sulphide, radon (radium emanations), nitrogen and oxygen.

Spa waters are applied, according to prescription, in varying temperatures and quantities, and at varying intervals, in different ways, e.g., by drinking, bathing and by inhalation. Ingeniously shaped bath containers are in use. Other forms of water applications include sprays, douches, irrigations, swimming and underwater exercises in pools. Volcanic muds are also applied.

The extent to which mineral waters are used varies from spa to spa. Some spa centres place great emphasis on the application of the waters, whilst at other centres it figures less prominently in the overall treatment of the patient.

At many European spa therapy establishments, the use of mineral waters forms only part of a regime, which includes other forms of physical medicine, such as selected breathing exercises, graded walks, participation in vigorous sports for those with the capacity to do so, massage, dietary treatment and periods of compulsory relaxation.

It is claimed that a sojourn at a spa can have a beneficial psychological effect on a patient. This is said to result from several factors, some of which are specially related to spas, whilst others are common to vacations in general. The latter category includes removal from the usual surroundings of home and vocation, with the attendant removal of associated tensions, the provision of congenial and picturesque surroundings, the relaxation of being waited upon instead of serving others, and participation in activities which give pleasure. In the former category, is the boost given to a patient's morale by the specialized facilities and treatment available to him at a spa therapy establishment.

An examination of the reasons which motivate people to attend the spas would seem to indicate that they roughly fall into three categories, firstly, those who attend for purely curative purposes, secondly, those who attend for purposes which might be deemed rehabilitation or rejuvenation and, thirdly, those who attend for psychological reasons, in as much as they benefit from the congenial atmosphere and pleasant environment of the spa resorts.

#### MEDICAL OPINION ON CURATIVE PROPERTIES (OR OTHERWISE) OF MINERAL SPA WATERS.

Whilst not specifically within the terms of reference for the Inquiry, the Committee felt it incumbent upon it to obtain medical evidence on the curative properties (or otherwise) of mineral spa waters. In this regard, evidence was obtained from the Australian Medical Association (Victorian Branch) and from individual members of the medical profession, including doctors specializing in the treatment of rheumatic disorders.

The witnesses generally agreed that most scientific thought did not subscribe to the claims sometimes made that mineral spa waters contain specific curative properties.

In so far as the oral intake of mineral waters is concerned, the evidence showed that the ingestion of waters containing laxative properties such as sulphates of sodium and magnesium, coupled with the disciplines enjoined in eating and drinking at spa establishments, can assist in some cases to relieve digestive disorders. However, similar results may be obtained by prescriptions of approved drugs or dietary supplements. In other cases, the indiscriminate drinking of waters of a purgative nature, without medical prescription, could produce harmful results.

It was conceded by the witnesses that, in some fields, particularly the treatment of rheumatic disorders, the use of mineral waters in the form of baths, douches, sprays, &c., does have some value, as part of an extensive physiotherapy regime, by virtue of their application at a prescribed temperature and by virtue of the inherent buoyancy and density of the water which assist in the re-education of limbs and muscles, &c. Such physical methods of treatment can, of course, be established apart from the spa water and are not specific to the ingredients in the particular waters.

It was submitted that scientific thought has realized the value of a regime integrating—

- (1) A supervised physical programme, including—
  - (a) Physiotherapy and, in the case of spa therapy establishments, using the heat, buoyancy and specific gravity of the waters as an adjunct to the exercise ;
  - (b) Rest ; and
  - (c) Relaxation ;
- (2) Organized physchotherapy, involving the following features :—
  - (a) A holiday away from the usual responsibilities and stresses of home and vocation ;
  - (b) A complete change of environment ;
  - (c) Improvement in morale through belief in the remedial qualities of the waters, and as a result of group therapy ;
- (3) Diet, with an appetising, wholesome diet and regular and relaxed meals being provided ; and
- (4) Suitable climatic conditions, with an absence of fluctuations in temperatures and humidity.

In this light, a modern spa therapy establishment can be regarded as a health resort, with specialized facilities geared to the total management of the medical, physical, psychological and social problems of the visitor. It envisages the highest standards of domiciliary, culinary and recreational facilities, along with the most modern spa facilities under the control of highly trained medical and other personnel.

It must be borne in mind that, depending upon the type of visitor, a spa resort can be either a place where a relaxing holiday can be enjoyed, or an institution where the qualities of the waters can be used as an adjunct to organized therapy. In either case, the physical surroundings and the quality of the service are all important.

The comments made in the preceding paragraph could be taken as an accurate indication of the current standard attitude of medicine in regard to spas. This is not necessarily the attitude of medicine in certain areas and among certain interested parties and, in this context, it must be remembered that a large number of spas throughout the world are conducted on the basis of commercial gain.

The Committee believes that the attitude of the medical profession in Victoria, or indeed in Australia, to the possible establishment of a modern spa therapy establishment in this State could well depend upon the nature and extent of the facilities provided, and any affiliations established with medical research institutions of the highest professional standard. For example, if it should be on the lines of American establishments, where commercialization of a holiday type resort, offering physical therapeutic facilities, is the keynote, doctors would probably be satisfied to send patients there for a holiday and a general toning up, just as they now send tired housewives away on an overseas trip.

On the other hand, if the establishment was affiliated with a University group or a Research Unit, or a highly skilled set-up for treatment, akin to the Mayo Clinic, doctors would be more favourably disposed to send their patients there.

In the opinion of the Committee, any spatherapy centre established in this State should be conducted only within the framework of adequate medical safeguards. In particular, the medical staff of such an establishment, should ensure that effective liaison is maintained with the patient's regular physician, to avoid possible tragedies, or accidents, when the patient's programme is planned. This programme should then be carried out by a trained staff, the members of which would have been fully instructed in the patient's condition and warned of any dangers in, or contra-indications to, therapy.

The Committee also believes that, unless a spatherapy centre received recognition by way of the acceptance of treatment as being within the ambit of the National Health Scheme, economic considerations would tend to restrict the clientele to the more affluent sections of the community.

#### TOURIST POTENTIAL OF DAYLESFORD-HEPBURN SPRINGS AREA.

In view of the dependence of the Daylesford-Hepburn Springs area on the tourist industry, the Committee examined the part played by its mineral spa water resources in the overall tourist pattern.

The early history of the Daylesford-Hepburn springs are is closely linked with the discovery and extraction of gold.

The *Victorian Gazetteer* of 1865 describes Daylesford as the centre of a large and rich gold-mining (Jim Crow Diggings) and farming district. Its industries then included 2 steam flour mills, 9 quartz crushing mills, 2 soap and candle works, and a biscuit manufactory. The town was endowed with 15 hotels and 2 newspapers, and had a population of 6,000 residents residing in some 1,250 dwellings. Concurrently, its sister town, Hepburn Springs, had a population of 1,500 residents, plus "a large number Chinese", whilst its amenities included 5 hotels.

Today, the population of the whole Shire of Daylesford and Glenlyon does not exceed 4,500 people, some 3,000 people less than the population recorded for the year 1865. There are now 8 hotels and 20 guest houses within the municipality.

With the decline and eventual collapse of gold-mining operations, greater emphasis was placed on the development of the mineral spa water resources of the district as the central feature of a tourist industry, which attracted large numbers of visitors during the period immediately before the 1st World War and the period between the 1st and 2nd World Wars.

The advent of the 2nd World War ushered in a period during which tourist interest in the Daylesford-Hepburn Springs area progressively declined, to the detriment of the economy of the region in general, which was essentially geared to the tourist industry.

The reasons why tourist interest in the area has dwindled are difficult to pinpoint, but there are grounds for thinking that the following factors in varying degrees have contributed to the present situation :—

- (1) The accommodation offered is mainly out of step with present day requirements. Motel and other accommodation, more in keeping with modern day living, is conspicuous by its absence.
- (2) The facilities provided for the public to use mineral waters in many instances are well below the standard offered in other countries where mineral spa resorts are flourishing.
- (3) Promotion, highlighting the mineral springs of the region, has been inadequate.
- (4) The Midlands region is now regarded as a target more for day tripping because of changes in the pattern of living, in which the motor car prominently figures.
- (5) The absence of any leading festivals or carnivals of a cultural or sporting nature, which would combine with the natural resources of the region to create the multiple attraction concept which is so essential to the encouragement of tourists.

The Committee considers that the Daylesford-Hepburn Springs area, by virtue of the volume of mineral waters available and because of the fact that it does have fairly substantial existing facilities (even though out-dated) to accommodate tourists, would be the logical place for any commercial development on the lines of a modern spa therapy centre.

Efforts to attract secondary industry to the region have, to date, been attended with little success, and a resurgence of interest in the area as a desirable tourist resort, featuring its mineral spa waters, could result from the building of a modern spa therapy establishment. The building of such an establishment could well encourage further associated development in the form of more sophisticated tourist accommodation than is now available.

In the opinion of the Committee, it is most important that, in planning any commercial development of mineral waters, involving the erection of buildings, the design and siting of structures should not detract from the environment in which they are situated.

#### CONTROL, MAINTENANCE, DEVELOPMENT AND PROMOTION OF MINERAL SPA WATER RESOURCES OF VICTORIA.

Although the aspects of control, maintenance, development and promotion are linked, the Committee felt that emphasis would be given to its observations and conclusions by dealing separately with each aspect of management.

##### *Control.*

In so far as the legal or statutory aspects of control and management are concerned, the Committee believes that there are adequate powers in the Land Act at the present time to afford effective control, provided large-scale commercial development is not visualized.

Section 221 of the Land Act, amongst other things, empowers the Governor in Council, or the Minister of Lands, to appoint a Committee of Management of any specified Crown Land

reserved for any purposes set out in Section 14 of the Act, for such term of office and subject to such conditions as may be determined in any particular case. Such a Committee of Management may comprise—

- (1) Any number of persons not less than three (usually these are nominated at a public meeting convened by the local Shire President) ;
- (2) The corporation of any municipal council ;
- (3) The governing body of any corporation ;
- (4) The Melbourne and Metropolitan Board of Works ; or
- (5) The National Parks Authority.

Section 222 (1) of the Land Act provides, amongst other things, that every Committee of Management so appointed, or a majority of its members, “ may exercise all such powers, functions and authorities and shall carry out all such duties as are conferred or imposed upon such committee by any regulations made by the Minister and shall have exclusive authority to do all such acts, matters and things as are necessary for or incidental to the carrying into effect or enforcement of all such regulations ”.

These are wide powers indeed and should provide sufficient legal authority to enable any reserve to be controlled and maintained.

Notwithstanding this, the Committee believes that, if large scale commercial development in the form of a modern spa therapy centre occurs within existing or future legal framework, control of the public reserve from which the mineral waters issue should be vested in a Committee of Management which includes representatives of the respective Government departments and/or authorities concerned.

#### *Maintenance.*

Whilst the legal machinery exists to provide for effective control and maintenance, more practical considerations of finance are the main problems facing Committees of Management of mineral spring reserves.

As previously indicated (refer page 15), the only source of revenue usually available to Committees of Management is by way of parking fees, some proportion of which is required to be disbursed in the payment of labour hired to effect the collection of such fees. This situation is, of course, not confined to Committees of Management of Reserves encompassing mineral springs.

The only Committee of Management with other present and potential sources of revenue is the Shire of Daylesford and Glenlyon which, by virtue of special legislation enacted, may enter into agreements to commercially use waters issuing within the Hepburn Springs Reserve and the Central Lake Reserve, Daylesford.

In evidence presented to the Committee, it was suggested that the charter under which grants are made available by the Tourist Development Authority for tourist amenities should be extended to provide assistance not only for the cost of capital improvements, but also for subsequent maintenance costs. This suggestion, in the view of the Committee, contains some merit ; but, no doubt, practical considerations of finance are involved.

The Committee is conscious that the problem of finding finance for the maintenance of reserves encompassing mineral springs is accentuated in a case where a Council, as Committee of Management, has a number of such reserves under its control.

#### *Development.*

The Committee has already dealt with the aspect of commercial development at some length (refer pages 18–21), and it would be superfluous for it to comment any further on the subject at this stage.

Other development, in the sense of the provision of public amenities and facilities of a capital works nature on mineral spring reserves, can be achieved by committees of management actively pursuing a programme of improvement with the assistance of grants from the Tourist Development Authority. In this regard, some Committees of Management have been more active than others.

#### *Promotion.*

The evidence indicates that there has been no co-ordinated approach to the promotion, on a State-wide basis, of the mineral spa water resources of Victoria.

To date, promotion has been carried out on a piecemeal basis by the individual Committees of Management of the Public Reserves from which the springs issue.

In most cases, expenditure by Committees of Management on promotional and publicity media seems to be minimal. For example, in the evidence tendered by the Shire of Daylesford and Glenlyon, a financial statement with respect to the Hepburn Mineral Springs Reserve was submitted which showed expenditure on printing and advertising to the amount of \$14 for the municipal year which ended on the 30th September, 1968.

Subsequently, correspondence was received from the municipality indicating that the figure shown in the statement of receipts and expenditure was misleading and that actual expenditure on promotion of the Hepburn Springs Reserve, including the public baths, over a period of 3 years

was slightly in excess of \$400. Accepting the latter figure as an accurate representation of the amount expended on promotion over a 3-year period, the Committee finds it difficult to escape the conclusion that promotional efforts by the Shire of Daylesford and Glenlyon have been on a very limited scale.

In the view of the Committee, increased promotional efforts to stimulate public interest in the mineral spa waters of Victoria would be unlikely to achieve desired targets, unless the facilities and amenities available to use the waters were to be simultaneously updated by the controlling bodies concerned.

With respect to the commercial use of mineral waters for bottling purposes, there is reason to believe that an intensive promotional campaign aimed at local and overseas markets would produce satisfactory results.

The successful operation of a modern spa therapy centre, similar to those which are established in Europe, may well entail promotional efforts directed at securing the support of the medical profession.

#### EFFECT OF THE OPERATION OF THE GROUNDWATER ACT 1969, No. 7849.

Until such time as the Groundwater Bill (passed by Parliament during May, 1969) is proclaimed, there will be no effective statute dealing with the control of groundwater in Victoria.

The simple objectives of that Act are to, firstly, secure supplies of water free of any charge for domestic and stock users, secondly, to protect the rights of other present users against excessive interference from uncontrolled future development, and to provide for the exploration, conservation and orderly development of these important water resources in the best interests of the State.

Controls, under the Act, fall generally into three categories—

- (1) Extraction of Groundwater ;
- (2) Construction and maintenance of bores ; and
- (3) Disposal of wastes to avoid pollution.

The Act provides that it shall be administered partly by the Minister of Mines, and partly by the Minister of Water Supply. Under Section 47, the right to use and control all groundwater is vested in the Crown and shall be exercised by the State Rivers and Water Supply Commission.

In Section 2 (1) of the Act "groundwater" is interpreted to mean "any water occurring in or obtained from an aquifer and includes any matter dissolved or suspended in such water". It seems clear from this interpretation that any water in a mineral spring before it reaches the surface is groundwater, which means that the provisions of the Act will apply to mineral water, as well as groundwater as a whole.

In particular, the development and utilization of mineral waters will be effected in the following ways :—

- (1) In view of the interpretation of "bore" which means "any bore well gallery drive or excavation or any artificially constructed or improved underground cavity", the artificial alteration of any mineral spring could only be undertaken in accordance with a bore construction permit issued by the Minister of Mines, pursuant to Part III. of the Act.
- (2) By virtue of the operation of Division I., Part V. of the Act, the extraction or use of groundwater (which would include mineral waters) from any such bore would not be permitted "except as authorized by and in accordance with the conditions of a groundwater licence issued under this Division and subject to the provisions of this Act and the Regulations".

The Act further provides that, in cases where a bore or proposed bore is to be used solely for the extraction of groundwater for domestic use and the watering of stock, the person concerned shall be—

- (a) Exempted from payment of the prescribed fee associated with the issue of a bore construction permit ; and
- (b) Absolved from obtaining a groundwater licence, provided he has given notice in the prescribed form to the State Rivers and Water Supply Commission of his intention to utilize the water for domestic use and the watering of stock.

In translating the provisions of the Act to the utilization of mineral waters, there seems little doubt that, upon its proclamation, the commercial use of mineral waters transmitted to the surface through a bore can be carried out only as authorized by and in accordance with the conditions of a groundwater licence.

The Committee has noted that "mineral water" is deemed to be a "mineral" within the meaning of the *Mines Act* 1958, No. 6320. When the Groundwater Act comes into operation, it would seem appropriate to amend the Mines Act so that the words "mineral water" are deleted.

## LIST OF WITNESSES.

The names, occupations and addresses of witnesses who gave evidence in the Inquiry are as follows :—

Name.	Occupation and Address.	Examined at—	Transcript Page No.
Bennie, W. A. ..	Grazier and President, Kyneton Chamber of Commerce ; Kyneton	Daylesford ..	100
Bradshaw, R. G. ..	Farmer and Councillor, Shire of Creswick ; Blampied ..	Daylesford ..	106
Brennan, K. F. (Dr.) ..	Medical Practitioner and Medical Officer, Department of Health ; Melbourne	Melbourne ..	24
Clarke, J. E. (Dr.) ..	Physician and Chairman, Therapeutics Committee, Alfred Hospital ; Melbourne	Melbourne ..	263
Cole, K. ..	Councillor, Shire of Daylesford and Glenlyon ; Commissioner, Daylesford Waterworks Trust and Member, Daylesford Industrial Development Committee ; Daylesford	Daylesford ..	69
Dehnert, C. A. ..	Primary Producer and Councillor, Shire of Ballan ; Ballan	Daylesford ..	102
Esplan, W. A. ..	Senior Geologist and Officer-in-Charge, Groundwater Section, Mines Department ; Melbourne	Melbourne ..	2 ; 289
Evans, A. T. (M.P.) ..	Member of the Legislative Assembly ; Smeaton.. ..	Melbourne ..	210 ; 283
Fitzgerald, P. J. ..	Guest House Proprietor and Director, Spa Area Development Co. Pty. Ltd., Hepburn Springs	Daylesford ..	107 ; 110
Glass, A. W. ..	Registered Bookmaker ; Councillor, Shire of Daylesford and Glenlyon and President, Hepburn Springs Progress Association ; Hepburn Springs	Daylesford ..	82 ; 292
Harkins, M. J. ..	Director of Tourist Development, Victoria and Commissioner, Tourist Association ; Melbourne	Melbourne ..	151A
Holt, A. J. ..	Secretary for Lands, Department of Crown Lands and Survey ; Melbourne	Melbourne ..	29
Jens, J. M. J. (Dr.) ..	Orthopaedic Surgeon and Senior Surgeon, Department of Orthopaedic Surgery, St. John of God Hospital, Ballarat ; Ballarat	Melbourne ..	204
Kenley, P. R. ..	Geologist and Assistant Director of Geological Survey (Technical), Mines Department ; Melbourne	Melbourne ..	2 ; 289
Langdon, R. J. ..	Motor Garage Proprietor ; Councillor of City of Castlemaine and Chairman of Vaughan and Glenluce Mineral Springs Committee of Management ; Castlemaine	Daylesford ..	119
Lelean, C. O. ..	Pharmacist and Chairman of Directors, Spa Area Development Co. Pty. Ltd., Daylesford	Daylesford ..	110
Little, D. J. ..	Civil Engineer and Divisional Engineer, Special Operations, State Rivers and Water Supply Commission ; Melbourne	Melbourne ..	167
Long, N. P. (Dr.) ..	Radiologist ; Melbourne .. .. .	Melbourne ..	257
McAlpine, D. L. ..	Grazier and Councillor, Shire of Yea ; Caveat .. ..	Melbourne ..	148
McLaughlin, R. J. W. ..	Acting Professor of Geology, University of Melbourne ; Melbourne	Melbourne ..	18
Menadue, J. E. ..	Retired ; Federal President ; Australian Natives' Association ; Melbourne	Melbourne ..	133
Miller, H. M. ..	Company Director ; Sydney, N.S.W. .. .. .	Melbourne ..	190 ; 265
Nelson, S. G. (Dr.) ..	Consultant Rheumatologist ; Chairman, Australian Arthritis and Rheumatism Foundation ; Vice President, International League against Rheumatism ; Past President, South East Asia and Pacific Area League against Rheumatism ; Sydney, N.S.W.	Sydney, N.S.W. ..	246
Neumann, Y. ..	Managing Director, Daylesford Nominees Pty. Ltd., Melbourne	Melbourne ..	158
Ogden, J. ..	Sawmiller, Company Director and Director, Spa Area Development Co. Pty. Ltd., Daylesford	Daylesford ..	110
Porter, S. G. ..	Shire Secretary, Shire of Kyneton ; Kyneton .. ..	Daylesford ..	93
Robinson, R. G. (Dr.)	Consultant Rheumatologist ; Secretary, Australian Arthritis and Rheumatism Foundation ; Secretary, General International League against Rheumatism ; President, South East Asia and Pacific Area League against Rheumatism ; Sydney, N.S.W.	Sydney, N.S.W. ..	253
Sattler, A. ..	Proprietor of Donnybrook Mineral Springs Reserve ; Donnybrook	Melbourne ..	174 ; 274
Shannon, H. T. ..	Director, Australian Natives' Association and Subsidiaries ; Melbourne	Melbourne ..	133
Stevens, L. J. T. (M.B.E.)	Councillor, Shire of Newstead and Secretary, Vaughan and Glenluce Mineral Springs Committee of Management ; Castlemaine	Daylesford ..	119
Stoneham, C. P. (The Honorable)	Member of the Parliament of Victoria ; Maryborough ..	Daylesford ..	119
Velik, L. ..	Solicitor and Director, Daylesford Nominees Pty. Ltd., Melbourne	Melbourne ..	158 ; 190 ; 265
Warrender, S. (The Honorable Mrs.)	Marketing Counselling and Promotion ; Melbourne ..	Melbourne ..	183

## ACKNOWLEDGEMENTS.

The Committee desires to place on record its gratitude for the valuable assistance it received from so many quarters during the Inquiry.

It is desired to convey to all witnesses the Committee's thanks for their co-operative approach to the Inquiry, and for the manner in which their evidence was prepared and presented. In particular, the Committee is indebted to Mr. A. T. Evans, *M.P.*, for the very comprehensive submission which he presented, based on the knowledge which he gained as a result of a study tour of European spa resorts.

The large volume of evidence tendered during the Inquiry was recorded most capably by the Chief Government Shorthand Writer and members of his staff, and the Committee desires to express its warm appreciation of their excellent work.

The Committee is indebted to its typiste, Miss J. J. Russell, for the capable manner in which she performed the work entrusted to her.

It is with pleasure that the Committee records its sincere appreciation of the efficient manner in which the Secretary, Mr. A. N. Castle carried out his duties.

R. A. CLAREY, Chairman.  
A. R. MANSELL, Deputy-Chairman.  
A. W. KNIGHT, Member.  
WILLIAM PHELAN, Member.  
EDGAR S. TANNER, Member.  
R. J. WILTSHIRE, Member.

A. N. CASTLE, Secretary.

13th April, 1970.



## APPENDIX "A"—continued.

## SUMMARY OF GEOLOGICAL CHARACTERISTICS OF KNOWN MINERAL SPRINGS OF VICTORIA.—continued.

Spring No.	Name or Location.	Parish (where known).	Geological Description of Aquifer (where known).
58	Sailors Creek Mineral Spring .. .. .	Parish of Wombat .. .. .	Alluvium over Ordovician Sediments
59	Bullarto Spring .. .. .	Parish of Bullarto .. .. .	Ordovician Sediments
60	Sailors Falls Mineral Spring .. .. .	Parish of Wombat .. .. .	Basalt "
61	Mineral Spring above Sailors Creek .. .. .	" " .. .. .	Possibly Basalt over Tertiary
62	Muir's Mineral Spring .. .. .	" " .. .. .	Gravel over Ordovician Sediments
63	Sailors Creek Mineral Spring .. .. .	" " .. .. .	Ordovician Sediments
64	Blackwood Spring .. .. .	Parish of Blackwood .. .. .	" "
65	Korweinguboora Mineral Spring .. .. .	Parish of Korweinguboora .. .. .	" "
66	" " " " .. .. .	" " .. .. .	" "
67	" " " " .. .. .	" " .. .. .	" "
68	" " " " .. .. .	" " .. .. .	" "
69	Spargo Creek Mineral Spring .. .. .	" " .. .. .	Possibly Alluvium over Ordovician Sediments
70	" " " " .. .. .	Parish of Moorabool .. .. .	Ordovician Sediments
71			
72			
73	Donnybrook Spring .. .. .	Parish of Kalkallo .. .. .	Alluvium over Silurian Sediments
73A	" " " " .. .. .	Parish of Merriang .. .. .	" " " "
74	Coimadai Spring .. .. .	Parish of Merrimu .. .. .	Junction of Ordovician Sediments and Permian Glacials
75 and 75A	Clarendon Springs (Refer also to Spring No. 95) ..	Parish of Clarendon .. .. .	Alluvium over Ordovician Sediments
76	Geelong Springs .. .. .	Parish of Corio .. .. .	Tertiary Limestone
77			
78			
79			
80	Clifton Springs .. .. .	Parish of Bellarine .. .. .	Ferruginous Sandy Rock which is either Lower Tertiary Bedded Volcanic Tuff or Upper Tertiary Sandstone
81			
82			
83			
84	Frankston Springs .. .. .	Parish of Frankston .. .. .	Alluvium
85			
86			
85	Krambruk Mineral Spring .. .. .	Parish of Krambruk .. .. .	Lower Cretaceous Sediments
86	Warby Spring .. .. .	Parish of Glenrowan .. .. .	Devonian Granite or Outwash from this
87	Johnstone Spring .. .. .	Parish of Mouzie .. .. .	Basalt and/or Tuff
88A	Shire of Mansfield .. .. .	On a property known as "Barragunda" .. .. .	" " "
88B	" " " " .. .. .	Merrijig district .. .. .	" " "
89	Yackandandah .. .. .	Parish of Yackandandah .. .. .	" " "
90	Dropmore Spring .. .. .	Parish of Dropmore .. .. .	Devonian Granite
91	Flowerdale Spring .. .. .	Parish of Flowerdale .. .. .	Silurian Sediments
92	Tylden Spring (Refer to also Spring No. 15) ..	Probably identical with Spring No. 15, or close to that Spring .. .. .	" "
93	Deep Spring (Refer also to Spring No. 38) ..	Probably identical with Spring No. 38 .. .. .	" "
94	McGuiness Spring .. .. .	The location is as for Spring No. 93; no further information available .. .. .	" "
95	Cantlon Spring (Refer to Springs Nos. 75 and 75A)	Probably identical with Spring Nos. 75 and 75A .. .. .	" "
96	The Salt Lick .. .. .	On Barwidgee (Myrtle) Creek, near Mudgegonga .. .. .	" "
97	Liberty Spring .. .. .	Parish of Wombat .. .. .	Ordovician Sediments
98	Golden Spring .. .. .	" " .. .. .	" "
99	Wagga Spring .. .. .	" " .. .. .	" "

## APPENDIX " B ".

## ANALYSES OF MINERAL SPRING WATERS—EXPLANATORY MEMORANDA.

*Reading of Salts in Solution—*

T.D.S.	..	Total dissolved solids expressed in parts per million by weight.
CL	..	Chloride
CO <sub>3</sub>	..	Carbonate
HCO <sub>3</sub>	..	Bicarbonate
SO <sub>4</sub>	..	Sulphate
NO <sub>3</sub>	..	Nitrate
NA+K	..	Sodium plus potassium expressed as sodium
Ca	..	Calcium
Mg	..	Magnesium
Fe	..	Iron
SiO <sub>2</sub>	..	Soluble Silica

*Zero Coding—*

Eg.		
SO <sub>4</sub>		
0	..	Indicates that SO <sub>4</sub> is present in solution—zero on left.
0000	..	Indicates a trace of SO <sub>4</sub> in solution—all zeros.
0	..	Indicates no sulphate in solution—zero on right.
		Blank indicates that particular salt was not analysed and its p.p.m. not determined.

*Decimal Places—*

Total Fe, Soluble Fe and PH are to one decimal place

Eg.

TOT

Fe

21 .. Reads Total Fe of 2·1 p.p.m. in solution.

Eg.

SOL

Fe

174 .. Reads Soluble Fe of 17·4 p.p.m. in solution.

Eg.

PH

65 .. Reads PH of 6·9.

*Month Coding—*

JA	January	JY	July
FB	February	AU	August
MR	March	SE	September
AP	April	OC	October
MY	May	NV	November
JU	June	DE	December

APPENDIX "B"—continued.  
ANALYSES OF MINERAL SPRING WATERS.

Identity No. as per Appendix "A."	Name or Location.	T.D.S.	CL	CO <sub>3</sub>	HCO <sub>3</sub>	SO <sub>4</sub>	NO <sub>3</sub>	Na + K	Ca	Mg	Total Fe	Soluble Fe	Soluble SiO <sub>2</sub>	PH	Total Hardness	Month.	Day	Year.	
2	Joyce's Creek	2333	579	0	781	170		449	64	115	240		119			MR		36	
3	Kynetton	2028	78	0	1366	0000		284	91	104	90		76				5	12	
3A	"	751	72	0	422	3		78	38	48	30		69					12	
4	"	4868	185	0	3322	0000		1096	109	89	200		37					12	
7A	Glenluce and Vaughan	4042	255	0	2640	57		531	252	235	130		44	65				64	
7D	"	4281	444	0	2552	149		431	305	285	140		80					12	
7D	"	3973	248	0	2583	113		422	247	261	0		78					12	
7F	Vaughan Main Spring	3649	365	0	2101	206	0	493	211	209	60		43					12	
7F	"	4117	253	0	2743	164		541	268	206	20		15	1027				61	
7F	"	3502	443	0	1918	167		468	168	274	90		43					64	
7G	Lawson	2977	437	0	1576	149		394	153	201	130		43					12	
7G	"	3432	356	0	1991	160		559	197	208	40		45					12	
7G	"	3456	446	0	1915	216	0	480	174	225	80	10	16	1295				12	
7G	"	3196	306	0	1869	143		432	177	207	90		40					61	
7G	"	4445	285	0	3004	20	1	615	268	194	490		40					64	
9	Limestone Creek	1444	81	0	730	0000		249	115	126	10		97			JU	10	12	
10	Boggy Creek	1813	83	0	1321	0		156	100	143	100		15			JA	23	41	
10	"	511	33	0	350	0		27	38	37	16		56			SE	22	61	
10	"	1934	75	0	1265	6		268	92	145	90		72					64	
10A	"	1768	74	0	1208	0000		192	94	109	000		20					12	
13	Upper Coliban	2118	324	0	1244	1		260	96	166	20		20			JU	10	12	
15	Tylden	1516	186	0	398	4		75	75	123	20		47					58	
15	"	1343	123	0	791	6		173	54	112	330		51					64	
16	Lithia	2438	120	0	1017	16		87	87	241	110		57					03	
24	Glenlyon	5906	131	0	4408	5		471	405	403	330		67					11	
27	Pavilion or Locarno	2418	60	0	1657	109		240	193	129	110		60	1014				29	
27	"	2815	56	0	1948	105		275	198	139	230		60					38	
27	"	1600	42	0	1797													60	
27	"	2148	56	0	1478	73	0		168	124			36					60	
27	"	2017	61	0	1396			200	155	195	30		25					61	
29	Wyuna	2253	27	0	1507	137	000	290	164	93	140		28	80				89	
29	"	2270	23	0	1584	43	000	310	162	70	30		28					89	
29	"	2152	59	0	1489	53			122	103	140		24	729				60	
29	"	2158	64	0	1503	38	0	292	126	100	60		24					61	
29	"	2024	63	0	1338	54		202	154	126	150		54					64	
31	Argyle	2093	93	0	1363	73		275	100	83	80		49	705				29	
31	"	2489	310	0	1739	26		317	141	144	80		47					64	
36	Tipperary	2781	36	0	1999	16		412	101	133	170		56					28	
36	"	2470	36	0	1766	14		367	94	144	60		51					29	
36	"	2436	32	0	1780	10		373	84	122	90		84					61	
38	Crystal or Deep Spring	1502	35	0	1038	4		95	104	103	170		73					10	
38	"	1446	36	0	1030	3		104	104	94	60		84					29	
38	"	1255	25	0	912	0	0	105	99	75	90		24	555				29	
38	"	1258	30	0	858	14		94	85	96	90		54					61	
41	Sutton	1733	59	0	1733														64
41	"	2804	48	0	1954	0000	0	374	147	119	12		64	858				29	
41	"	2823	51	0	1980	0000	0	473	153	123	09		57	889				29	
41	"	2720	50	0	1886	0000	0	351	148	113	15		67	836				29	

41	2824	71	0	1929	9	0	373	152	120	14	66	874	29
41	2604	68	0	1777	0000	0	311	156	114	18	67	860	29
41	2301	40	0	1363	0000	0	228	128	79	25	69	646	29
41	2302	48	0	1669	16	0	336	124	100			718	60
41	1560	59	0	1733		0							60
42	2457	60	0	1708	30	0	252	173	123	280	56	939	29
42	2624	42	0	1843	20	0	278	143	132	730	48	901	29
42	2683	56	0	1863	31	0	267	187	136	300	44	1028	29
42	987	46	0	676	12	0	68	68	54		15	393	59
42	990	40	0	690	21	0	113	74	52		61	398	60
44	2832	16	0	2111	10	0	241	216	169	60	47		29
45	2560	175	0	1692	7	0	232	194	189	70	48		64
49	1967	19	0	1472	3	0	167	167	130	02	36		60
49	2037	20	0	1475	6	0	145	166	148		54		64
51	2097	60	0	1469	13	0	261	136	95		41		29
51	2164	41	0	1581	8	0	257	140	107		18	791	59
51	1942	53	0	1429	9	0	257	70	127		47	695	60
51	2218	42	0	1576	8	0	257	140	124		26		64
52	1721	23	0	1249		0	227	125	61		47		11
53	1787	13	0	1298		0	280	118	46		23		11
53	2474	22	0	1844	2	0	157	109	109	02	16		60
53	2590	20	0	1874	7	000	37	431	431	04	16	524	60
54	2391	18	0	1749			353	156	75		26		11
54	1949	18	0	1414			275	127	67		31		11
55	2396	15	0	1751			345	147	85		39		11
56	3600	11	0	2652			597	187	105		31		11
57	2746	26	0	2055	22		162	162	174	140	14	1118	61
60	2945	18	0	2221	10		328	176	172	140	15	1150	61
60	2934	20	0	2176	7		292	201	174	140	43		64
61	2386	17	0	1763	13		245	170	126		31		29
64	2934	38	0	2176	5		378	97	93		23		64
64	1705	89	0	1130	15	0	359	104	8		37		87
72	2503	45	0	1599	179	0	436	114	83		6		61
72	1924	30	0	1407	0	0	315	88	72		52		64
73	4229	503	0	2555	46	0	508	135	406		90		24
73	4749	523	0	2896	56		649	173	327		34		57
76	7516	3255	0	1481	172			288	166		30		57
77	7411	3278	0	1207	346			230	191		30		57
78	6709	2966	0	1251	152			210	161		60		87
79	8673	3829	0	1086	814	000	2200	257	429		23		87
79	6969	3343	0	886	286	000	1900	243	257		34		87
79	6886	3086	0	657	700	000	1986	143	243		56		87
79	6900	3414	0	743	286	000	1814	157	343		102		87
79	8429	3743	0	1657	200	000	2029	300	414		68		87
79	6816	3257	0	1000	229	000	1686	157	387		79		87
79	7243	3457	0	1043	229	000	1914	143	343		90		87
79	6040	3156	0	512	286	000		143	308		65		57
79	5659	2792	0	649	278	0		134	267		63		57
79	218	4400	41	492	52	0		19	2		13		59
83	376	59	0	21	88	000	675	24	17		2		87
84	2275	1183	0	133	45	000	73	37	64		109	544	69
85	1221	29	0	839		0	150	150	45	93	76	702	29
90	2006	71	0	1379	23	0	253	126	94	08	39	592	29
97	1509	60	0	1009	14	0	147	100	83	11	63	745	29
98	1965	34	0	1401	11	0	207	136	99	0	40	821	59
99	2025	37	0	1487	7	0	211	151	108	63	17	754	60
99	1877	55	0	1370	10	0		122	109	63			

## APPENDIX "C".

TABLE OF MINERAL SPRINGS SHOWING STATUS OF LAND FROM WHICH EACH MINERAL SPRING FLOWS, AND WHERE APPROPRIATE, FORM OF CONTROL AND MANAGEMENT.

No.	Name.	Status of Land.
1	Newstead Mineral Spring ..	Not recorded on Departmental plans. In any case now encompassed with land acquired for Cairn Curran Reservoir
2	Joyce's Creek Spring ..	Spring proclaimed but site not reserved. In any case now encompassed with land required for Cairn Curran Reservoir
3 and 3A	Kyneton Mineral Springs ..	Portion of Permanent Reserve to the Campaspe River. Present reserve of 11a. 3r. 35p. is under control of Metcalfe Shire Council as C.O.M. Of the 11a. 3r. 35p., 3a. 3r. 22p. was purchased in 1914 with a Government grant of \$60 and transferred to the Crown; 2a. purchased in 1928 by Council for parking area and transferred to Crown. Latter area reserved for recreation, convenience and amusement of the people.
4	" " " ..	Freehold land
5	Yandoit Mineral Spring ..	" "
6	" " " ..	Location not accurately known
7	Mineral Springs between Glenceluce and Vaughan (8 Springs)	A total of 206 acres reserved; 107 acres being reserved for "preservation of such land and the springs thereon and for the recreation, convenience and amusement of the people"; and 99 acres reserved for a public park and recreation. Under the control of a C.O.M. consisting of representatives of Castlemaine City Council, Newstead Shire Council, Castlemaine Tourist Association, Castlemaine and District Development Association, Castlemaine Royal Automobile Club of Victoria, Citizens of Campbells Creek.
8	Mineral Spring (Parish of Fryers)	In Reserved Forest.
9	Limestone Creek Mineral Spring	Freehold land
10 and 10A	Boggy Creek Mineral Spring..	3½ acres reserved for purposes of a public park and gardens. Under control of Kyneton Shire Council as C.O.M.
11	Franklinford Mineral Springs	Freehold land
12	Mineral Spring ..	Cannot be located on Departmental records
13	" " ..	Now inundated by Coliban Reservoir
14	" " ..	
15	Tylden Springs ..	In bed of dry creek but location data not sufficient to determine its status.
16	Lithia Spring (Elevated Plains Soda Spring)	8a. 2r. 35p. reserved for public purposes under control of Daylesford and Glenlyon Shire Council as C.O.M.
17	Dry Diggings Mineral Springs }	On Crown land in bed of Dry Diggings Gully and on Government road reserve. Location data not sufficient to determine status.
18	" " " " }	
19	Glenlyon Spring ..	Freehold land
20	Kangaroo Creek Spring	" "
21	Woolnough's Crossing	
22	(4 springs) ..	
23	" " ..	
24	Glenlyon Mineral Spring ..	Located on an area of 51a. 1r. 27p. reserved for purposes of racing and other purposes of public recreation. Under control of Daylesford and Glenlyon Shire Council as C.O.M.
25	Boots Gully or Henderson Spring }	On Crown land but location information is not sufficient to determine status.
26	Tucker Point Mineral Spring }	
27	Locarno Spring (Pavilion or Main Spring)	68a. 2r. 20p. reserved for purposes of mineral springs and public park under control of Daylesford and Glenlyon Shire Council as C.O.M. Hepburn Springs Land Act No. 6517 empowers C.O.M. to grant lease over 2a. 0r. 17p. of reserve for "working of mineral springs thereon and the collection, preparation, sale and removal of the natural waters and the gas thereof and for no other purposes". See also Nos. 97 and 98.
28	Hepburn Mineral Springs } One of these is Wyuna Spring }	
29	" " " " }	
30	" " " " }	
31	Argyle Spring ..	207a. 1r. 23p. reserved for "preservation of such land and springs thereon for the recreation convenience and amusement of the people". Under control of Daylesford and Glenlyon Shire Council as C.O.M.
32	Kangaroo Creek Mineral Spring	Freehold land
33	Bald Hill Mineral Spring ..	" "
34	Loddon River Mineral Spring	In Reserved Forest
35	Fairy Dell Spring ..	5 acres reserved as a site "for affording access to a mineral spring". Under control of Daylesford and Glenlyon Shire Council as C.O.M.
36	Tipperary Spring ..	
37	Brandy Hot Spring ..	Location not clear from Departmental records
38	Crystal or Deep Creek Spring..	Original spring on freehold land (See also Nos. 44, 45, 47, 93 and 94)
39	Leggatt Spring ..	Nos. 39 and 40 are probably submerged beneath Lake Daylesford. Area of 157a. 0r. 36p. reserved "for mineral springs and ornamental lake and for the recreation, convenience and amusement of the people". Under control of Daylesford and Glenlyon Shire Council as C.O.M. Daylesford Spring Land Act No. 7396 empowers C.O.M. to make agreements to commercialise mineral water.
40	" " ..	
41	Sutton Spring ..	Under control of Daylesford and Glenlyon Shire Council as C.O.M. Daylesford Spring Land Act No. 7396 empowers C.O.M. to make agreements to commercialise mineral water.
42	Central Spring (Hard Hills Spring)	
43	Coliban Mineral Spring ..	Located in Reserved Forest
44	Eganstown Mineral Spring ..	Freehold land
45	Corinella Mineral Spring ..	" "
46	Sailors Flat Mineral Spring ..	Reserved Forest
47	Eganstown Mineral Springs ..	Located on Crown land, but records not sufficiently accurate to determine status
48	Sailors Creek Mineral Spring	In reserved Forest
49	Leitches Creek Spring ..	3 acres reserved as a site for affording access to a mineral spring. Under control of Daylesford and Glenlyon Shire Council as C.O.M. (see also No. 59)
50	Bagnall's Mineral Spring ..	In Reserved Forest
51	Soda Spring (Jubilee Lake Spring)	58a. 3r. 8p. freehold land, site of Hepburn Reservoir held by Daylesford and Glenlyon Shire Council—special conditions in Grant

APPENDIX "C"—*continued.*TABLE OF MINERAL SPRINGS SHOWING STATUS OF LAND FROM WHICH EACH MINERAL SPRING FLOWS, AND WHERE APPROPRIATE, FORM OF CONTROL AND MANAGEMENT.—*continued.*

No.	Name.	Status of Land.
52	Lyonville Mineral Spring	2a. 3r. 35p. reserved "for the preservation of such land and the Spring thereon and for the recreation, convenience and amusement of the people". C.O.M.—Daylesford and Glenlyon Shire Council.
53	" " "	
45	" " "	
55	" " "	
56	" " "	
56A	" " "	50 acres reserved for mineral springs, public recreation and public purposes. C.O.M.—representatives of Daylesford and Glenlyon Shire Council and members of public nominated at a public meeting
56B	" " "	
57	" " "	
58	Sailors Creek Mineral Spring..	In Reserved Forest
59	Bullarto Spring ..	See No. 49
60	Sailors Creek Mineral Spring..	In Reserved Forest
61	" " " " ..	Freehold land
62	Muir's Mineral Spring ..	" "
63	Sailors Creek Mineral Spring..	Not recorded on Departmental plans
64	Blackwood Spring ..	3a. 3r. 21p. reserved for purposes of mineral springs and tourist camp purposes. C.O.M. of local residents nominated at a public meeting
65	Korweinguboorra Mineral Springs (Spargo Creek)	50a. 1r. 5p. reserved for mineral springs. No C.O.M. since 1963 apparently due to lack of local interest. At present area held under annual grazing licence
66	" " " "	
67	" " " "	
68	" " " "	
69	Mineral Spring near Spargo Creek	On river frontage to Werribee River. Depending on exact location, may be within Reserved Forest
70	" " " "	Presumably on freehold land
71	" " " "	
72	" " " "	
73	" " " "	
73A	Donnybrook Spring	On Freehold land
74	Coimadai Spring ..	
75 and 75A	Clarendon Springs ..	On "Crown" land utilized for water supply purposes
76	Geelong Springs ..	Located on Eastern Beach Reserve, reserved for "recreation, convenience and amusement of the people". C.O.M. Geelong City Council. (It is understood that springs have been declared unfit for human consumption and sealed off)
77	" " ..	
78	" " ..	
79	Clifton Springs ..	On Freehold land
80	" " ..	
81	" " ..	
82	" " ..	
83 and 84	Frankston Springs ..	Location not accurately known
85	Krambruk Mineral Spring ..	On freehold land
86	Warby Spring ..	Situated on Hume Highway reserve under control of Country Roads Board
87	Johnstones Spring ..	Apparently located within boundaries of Mt. Richmond National Park under control of National Parks Authority
88A	Barragunda Spring ..	Located on Crown land in bed of Broken River
88B	Merrijig Spring ..	Location not known
89	Yackandandah Spring ..	On Government Road—understood that Yackandandah Shire has developed Spring
90	Dropmore Spring ..	Crown land—portion of reserve enclosed with freehold land
91	Flowerdale Spring ..	On freehold land
92	Tylden Spring (See No. 15) ..	On Government Road—exact location not known
93	Deep Spring ..	See No. 38. There seems to be some confusion concerning location
94	McGuinness Spring ..	
95	Cantlon Spring ..	Possibly a duplication (See No. 75) within Reserved Forest
96	The Salt Lick ..	
97	Liberty Spring (Hepburn)	
98	Golden Spring (Hepburn)	See Nos. 27, 28, 29 and 30
99	Wagga Spring ..	See Nos. 39, 40, 41 and 42