

# ENVIRONMENTAL CONSIDERATIONS IN PETROLEUM EXPLORATION IN NEW ZEALAND

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The author has adopted a wide definition of the environment so as to encompass not only the physical environment but the wider consent process applicable both to exploration and the development of oil and gas resources. The paper draws on the author's experience as a legal adviser to Shell BP and Todd Oil Services Limited, the Operator of the Maui Offshore Maui and Onshore Kapuni Fields.

The environmental management guidelines of all companies involved in exploration should stress that environmental matters be actively considered at all stages in the life of the operation. The author considers that the industry would accept that economic progress and realistic environmental protection are not in conflict but are in essence complementary.

At a time when the Government is undertaking a far-reaching review of the law relating to resource management it is important that those who have a commercial interest in the development of natural resources endeavour to ensure that the legal framework within which they must carry on their business, achieves co-operation rather than conflict, between the various parties involved: industry, Government and environmentalists.

## INTRODUCTION

In setting out to write on the topic *Environmental considerations in petroleum exploration in New Zealand*, one is immediately conscious not so much of the present regime, but of what is likely to be the regime in the near future. One is left with the feeling that, as with so much of New Zealand life, the present regime will shortly be changed beyond recognition. Insofar as the petroleum exploration and production industry is concerned only time will tell whether the proposed administrative and legislative changes are an improvement on what presently exists.

The industry has, in my opinion, been well served by the Petroleum Act 1937 and its associated regulations. This legislation has recognised not only the unique characteristics of petroleum, but also the nature of the businesses which are involved in the exploration for and the development of that resource. There must be a concern that these fundamentals of the petroleum industry which distinguish it from other types and forms of mining, be they gold, coal or minerals, may be lost sight of in the pursuit of a regime that seeks to be all things to all prospectors.

There are two major areas that are presently the subject of government reform:

### Resource Management Law Reform

This is a mammoth task involving the examination of over 20 statutes and is predicated on the view that the current legal regime facilitates neither development nor participation in decision making. The Government has stated that its objec-

tive is to introduce better systems, which reduce unnecessary delays whilst protecting the environment. We have yet to see the Bill which will be the culmination of this exercise. There is however, to be a paper presented on these proposals during this conference.

### The merger of the Ministry of Energy with the Ministry of Commerce

The Government's decision, announced in the Budget of 27 July 1989, to merge the Ministry of Energy with the Ministry of Commerce is stated to be *for the reason that a separate Ministry of Energy can no longer be justified*. The new merged Ministry will come into being on 1 December 1989 and will no doubt be involved in providing policy advice to the Government on energy matters and in administering the petroleum licensing regime. As a consequence of this merger and as a result of a further legislative reform, relating to occupational safety and health, those personnel presently in the Ministry of Energy, including probably the Chief Inspector of Petroleum, will transfer to the Labour Department. The Government has decided that *in future one agency should be responsible for policy and delivery of occupational safety and health in all industries and activities of all types of employment* and that that agency should be the Labour Department. The Budget also states that it is the Government's intention that *in the future there should be one Act to cover all work related hazards in place of the wide range of existing legislation covering different industries and activities*.

This proposed dismemberment of the Ministry of Energy will mean that the petroleum exploration industry will have to establish new relationships and understandings, as the Labour Department will no doubt wish to merge the functions of the Chief Inspector of Petroleum into its wider inspectorates and this will lead to a different approach or style in the dealings between the industry and the bureaucracy.

This paper will address the environmental considerations in petroleum exploration as being on two levels; the macro environmental decision making process and the micro consent process.

### THE POLITICAL ENVIRONMENT (THE MACRO ISSUES)

Section 3 of the Petroleum Act 1939 deems petroleum in its natural state to belong to the Crown. It is a national asset rather than a local asset. It is therefore the responsibility of Central Government, on behalf of the community, to provide an appropriate *environment* for investors to risk their capital in the search for and the extraction of petroleum. It is the Government which provides economic incentives which ameliorate the financial risk involved in exploring for petroleum and which provides the legislative framework for access to prospective areas and secure title to resources discovered.

A further function of the Government is to provide a national database upon which cost efficient exploration programmes can be mounted.

At present, the Petroleum Act 1937 controls the allocation of and access to the petroleum resource. The Petroleum Regulations 1978, ensure that the operations undertaken to explore and develop petroleum resources are undertaken safely and without detrimental environmental effects. The legal framework within which exploration activity is undertaken is set out in the environmental statutes which govern water quality, town planning, noise and visual impacts.

It falls to the Government as the owner of the petroleum resource to measure and determine the cost and benefit of competing resource demands and values with the intent of ensuring benefit to society. Thus, the legislators must grapple with the concept of the wise use of natural resources; a concept which carries within it the question of whether the resource should be explored for at all.

Because these macro decisions are of national importance it is not appropriate or sensible for these decisions to be referred by the legislators to, for example, an administrative body or local government. It is for the Government to lay down appropriate ground rules so as to enable developers to proceed with their prospecting and the risking of their capital in the sure knowledge that should they be successful they will be permitted to proceed with a development of the discovery in an exercise which will involve considerable expenditure, often extending over years, in an investment that is planned to last for 20 to 30 years.

Unless developers are given a sense of security in these matters, their status will be that of speculators. No developer with any sense of responsibility wishes to be exposed to an unknown future and thus will be concerned to ensure that its planning can be undertaken against a background or at least

a commitment on the part of the Government to a wider national plan for the development of the nation's resources. Indeed, it may be in the national interest for the Government to encourage the development of a petroleum resource where there is an incentive to become involved. These issues therefore involve the overall economic strategy of the Government.

The White Paper on the Development of the Maui Field, which was released by the Minister of Energy Resources, the Hon. Mr W.M. Freer, in October 1973, is a unique document in the development of natural resources in New Zealand. It details the background to the negotiations between the Crown and the Shell, BP and Todd Consortium and how it was that the Government came to be a joint venturer in that undertaking. The preface to the White Paper states *the development of Maui is the largest single undertaking ever entered into by the State in the history of New Zealand*. In my view, historians will conclude that this single project has been the most significant development in New Zealand during the 20 years from 1969 to 1989.\*

The discovery and development of the Maui Field illustrates the complex interaction of science, technology, economics, law and politics that are involved in the resource area. It is the balancing of these matters which is at the heart of the Resource Management Law Reform.

### RESOURCE USE AND ENVIRONMENTAL PROTECTION

The current debate about resource management and the environment is not a matter which is restricted to New Zealand. To the contrary, international events are such that it is now a reality to say that all countries and their Governments, be they capitalist or communist, wealthy or poor, are attempting to tackle and to achieve a balance. The grip which mankind has on the world is now an issue of international importance and in many instances the issues are bigger than any one Government is able to deal with in isolation.

When we look at this topic in the New Zealand context we must recognise the impact on our perceptions of the problems thrown up by environmental issues elsewhere. In recent years these have included the Chernobyl disaster, the heightening of Government and public concern relating to the greenhouse effect, the increasing concern as to how man deals with the disposal of nuclear, chemical and other wastes, the debate on how to protect the last frontiers of the world such as the Amazon basin and the Antarctica, and, in the petroleum industry, the Piper Alpha catastrophe and the damage to the fragile Arctic environment as a result of the oil spill from the *Exxon Valdez*. We are fortunate that the generally undeveloped nature of our country affords us the opportunity to plan positively for the future unhindered by a historic millstone.

All of these events have had a cumulative effect upon the thinking of the citizens of the world, and, where they have been able to do so, they have expressed their views through the ballot box. This was the situation in the recent EEC elections in Britain and, closer to home, the State elections

\* The Maui Field was discovered by the Maui-1 well which was spudded in January 1969.

in Tasmania. As a resident of Taranaki, where the local newspaper has been headlining the proposal to drill an exploration well within the confines of the Sugar Loaf Islands Marine Park at Port Taranaki, the issue of preservation versus development has been brought clearly into focus. It is an issue which has brought protesters onto the streets of New Plymouth and has also been raised as a possible local body election issue.

The view which is being more generally expressed by citizens may be rationalised as a reaction against technical matters. In other words, conservationists are in the ascendancy in the debate between preservation and development.

New Zealanders, however, must recognise that the standard of living they enjoy will in large be based upon petroleum resources extracted from beneath the earth's surface. These resources do not exist until they are located, at which time the market place gives them a value. If they are not discovered they will have no value now, or in the future.

Although petroleum exploration and down stream processing are now firmly established in New Zealand, a fact which has not been achieved without some conflict, the future must hold the possibility of an even greater environmental awareness being required of those who would risk their capital to find and develop petroleum resources within New Zealand.

Petroleum exploration is very much part of the history of New Zealand, Taranaki and New Plymouth. The first well having been dug by hand and oil discovered on 18 January, 1866, just seven years after Colonel Drake began the modern petroleum industry when he struck oil in Pennsylvania, United States.

At the micro decision making level, prospecting for petroleum is no longer simply a function of petroleum engineering disciplines, if it ever was. It is a multidisciplinary exercise involving, *inter alia*, politicians at all levels, specialists in social and cultural issues, industrial relations, water, soil, air and noise control and management, public relations and economics. All are involved in the consent process: a process which requires planning, time and money. Site specific environmental considerations continue through the life of any resource project, involving principal and contractor alike.

The New Zealand experience in petroleum exploration has been good from the point of view of having caused minimal environmental damage and cost. The impact of oil exploration activities themselves, when compared with other forms of mining, is minimal. It is the potential for accidents and how these are contained and managed which involve the wider environmental issues.

When talking of the petroleum exploration industry one must not lose sight of the fact that it is an industry involving considerable technical expertise and financial resources which operates on an international basis. Environmental protection depends upon economic prosperity and development and thus on responsible industrial activity. Environmental management requires a co-operative industry capable of dealing with the scope and complexity of new environmental issues and an acceptance that economic progress and environmental protection are not in conflict but are in essence complementary. There is a growing acceptance of the need for co-operation between the various

parties involved: industry, Government and environmentalists. For the industry to prosper it must be ahead of changing attitudes and standards, and must make sure that it does not create residual problems by present practices, however responsible they may seem today.

### THE PETROLEUM ACT 1937 ("THE ACT")

Fundamental to an understanding of petroleum exploration in New Zealand is the legal fact that to prospect or mine for petroleum without a licence is forbidden .

The Crown is represented by the Minister of Energy and through the Ministry of Energy the Crown fulfils many roles; regulator, administrator, the owner of certain facilities, and frequently a joint venturer. Until March 1988 the Minister of Energy was the majority shareholder in Petrocorp and through its subsidiary, Offshore Mining Company Limited, held a 50% interest in the Maui Field. In addition, the gas produced from that Field was sold to the Crown.

Recent history has shown that the role of the Minister in the granting of licences to himself, particularly where that licence is a mining licence, is a complex legal issue and we must await with interest the decision of the Court in the case of *Petrocorp v Minister of Energy* in relation to the Ngaere Mining Licence.

Putting aside the Ngaere example, the present regime for the obtaining of a prospecting licence is through the work programme bidding system. The current policy is for that programme to be assessed on its technical merits and also regarded as had to the ability of the potential explorer to carry out the work and to fully evaluate the results. The Minister grants licences *on such terms and conditions as the Minister may specify*. In practice, such conditions relate to the term of the licence and the agreed work programme rather than to matters relating to the environment. The process is therefore a mechanism of separating out the potential explorers and to ensure that only technically competent organisations are licensed. From the lawyers' perspective the term *licence* is somewhat a misnomer because the prospecting licence is more in the nature of a contract with the Crown than a simple authority to do something which would otherwise be illegal.

It is the Government's present policy, acting through the Minister of Energy, to retain an 11% non-contributory interest in all prospecting licences. In a number of instances the Government has also taken a further contributory interest. The reasons for this involvement of the Government must be that it considers petroleum to be a resource of significant national value and importance, and as such the Government seeks to have a *say* in the joint venture.

It might be thought that as the Crown is the grantee of a petroleum prospecting licence the licensee would be entitled to proceed to prospect on the terms laid down in the licence. That is not the case. Unlike other mineral licensing regimes which combine environmental consents at the licensing stage the petroleum licensee must, having received the prospecting licence, obtain a number of consents. These consents are really in the nature of site-specific consents.

The licence holder must obtain the written consent of the Chief Petroleum Inspector to do the work which it wishes to undertake. Regulation 22 of the Petroleum Regulations 1978, which relates to geophysical prospecting, provides

that the Chief Petroleum Inspector *may grant his consent subject to such conditions as he thinks fit to impose.*

Because of the nature of this work it is understood that the Chief Petroleum Inspector does not involve himself in the detailed aspects of such surveys as they are really part of the initial licensing process.

Regulations 39 and 40 set out similar legal requirements for the obtaining of consent to drill. In considering whether to grant this latter consent, Regulation 40(3)(b) further provides that the Chief Petroleum Inspector may require the applicant *to provide an environmental assessment.* In practice this environmental assessment is more in the nature of an information statement as to the particular site. More sophisticated documents have been prepared by some licence holders on occasion but it is understood that this work has been performed on the basis of a decision made by the licence holder rather than at the behest of the Chief Inspector of Petroleum.

The Act affords a general right of entry onto land (Section 28) for the purpose of exercising any powers conferred on the licensee by or under the Act, but that general right is subject to other provisions of the Act, particularly Sections 29 and 30. Section 28(2) requires all persons exercising any powers conferred on the licensee by the Act to do as *little damage or injury as possible to the property and rights of other persons.*

In the area of access consents Section 29 is of the utmost of importance. Section 29(1)(a)-(q) lists a very extensive range of classes of land for which consent is required, including; national parks, marine and public reserves, wildlife refuges, the foreshore seabed and continental shelf and any road or street.

Section 29(3) requires the written consent of the appropriate Minister and provides that no work is to be undertaken except in accordance with the conditions upon or subject to which the consent is granted. Section 29(5) provides that the Minister may refuse consent or give consent unconditionally or subject to such terms and conditions as he thinks fit to impose. In some instances it is necessary for the Minister to consult with others.

The consent to enter to be given by the appropriate Minister is however, governed by the Petroleum Act. The consent being sought is a consent to enter onto the land not a consent to prospect on the land although in giving consent the Minister must take into account the values protected by the particular legislation for which he is responsible. It is submitted that the position is different to that which arose in the case of Spectrum Resources Limited v The Hon. Helen Clark [1988] 7NZAR 333, where the Minister of Conservation declined to issue a consent to mine.

There are three further Sections of the Act, namely Sections 30, 3; and 47(n) that also lay down limitations on the right of access. Sections 32 and 33 are concerned with matters of compensation for damage and notice of entry to occupiers, respectively.

Because the petroleum industry requires certainty it might be more helpful for all parties if the boundaries of petroleum prospecting licences were to be drawn at the outset to ex-

clude those areas in which exploration will not be permitted.

Having attained the necessary ministerial consent to enter public land, or the consent of a private owner in respect of certain classes of private land, the licence holder must still obtain further consents which are set out below. As to geophysical work this is more specifically dealt with under the heading of Kapuni 3D Survey which is discussed later in this paper. It is submitted that consents in that area are more in the nature of community consents than environmental consents.

## WATER AND SOIL CONSERVATION ACT 1967

The obtaining of a water right is in many instances the only consent which must run the gambit of a formal hearing. It is the avenue whereby objectors can participate in the consent process. The recent example of the application for a water right for a well to be drilled in the Sugar Loaf Islands Marine Park is a case in point. Because it is the only avenue open to them there is a perception on the part of some objectors that by this means they can raise the whole spectre of environmental issues including whether exploration in a specific site should be undertaken at all. This right of objection raises extremely important issues relating to the involvement of the public at large in resource management questions and will no doubt be a matter which will be addressed in the Resource Management Law Reform exercise. It is important from the industry's perspective as it introduces the Judicial hierarchy of the Catchment Board hearing followed by the right of appeal to the Planning Tribunal with further rights of appeal, on questions of law, to the High Court and Court of Appeal. This exercise inevitably involves time and cost.

For an operator using modern drilling equipment and technology including *safe* muds and abiding by appropriate environmental management guidelines, the risk to the environment of a drilling campaign is small. It is submitted that in the area of oil pollution there is a much greater inherent risk to the environment from an oil tanker accident than the possibility of pollution from the loss of an exploration well. It is interesting to note that in the Gulf of Mexico oysters are grown and harvested in the immediate vicinity of drilling units and production platforms.

There is also a degree of inconsistency in this area. For drilling offshore outside the 12 mile territorial sea the discharge of drill cuttings, mud and domestic waste from a drilling unit is dealt with by the Minister of Foreign Affairs under the Continental Shelf Act as part of the consent to enter application. The Minister of Transport, under the Marine Pollution Act 1974, issues a permit in relation to drill cuttings only. Inside the territorial sea that is not the case and an application must be made to the appropriate water board under the Water and Soil Conservation Act 1967.

As an example of such an application, reference can be made to the Mokau-1 well drilled in PPL38098. Application was made for a water right to discharge up to 525 m<sup>3</sup> of cuttings and 3488 m<sup>3</sup> of fluids (drillings muds and additives) over the period of the right. This was the first application for a discharge water right for offshore petroleum exploration activities which the Taranaki Catchment Board had received. The application was advertised in the normal way

and objections were called for but no formal objections were received. The Catchment Board obtained a background technical report on the application from its Senior Biologist. This document considered the nature of drilling muds and the impact of mud and drill cuttings on the marine environment. The Catchment Board as part of its consent required the payment of \$7000.00 for the preparation of this report. The Catchment Board required the Operator to provide comprehensive information on the nature of the drilling mud, the facilities on the rig and a detailed contingency plan which would apply in the event of a *blow out* of the well or other like emergency.

It was a condition of the water right that *on a monthly basis, officers of the Taranaki Catchment Board shall inspect the operation ....* In the event such monitoring was non-existent.

There was considerable discussion between the Operator and the Taranaki Catchment Board on these monitoring requirements and on the costs which the Catchment Board sought to recover for this work. The costs initially set by the Taranaki Catchment Board for the grant of the water right were considerably higher than had been the case with the Waikato Valley Authority in respect of a water right application for an exploration well drilled by the same Operator off Kawhia. The extremely wide powers afforded to a Catchment Board under the Water and Soil Conservation Act to recover costs, especially in the area of monitoring, must be a matter of concern to the industry. The charges levied should be a cost recovery only and not extend beyond the requirements of the project. The water right application should not be used as a mechanism whereby the applicant is required to produce a considerable quantity of environmental data, which is not directly relevant to the application. Information which is produced as a result of the operation, such as oceanographic data from wave rider buoys, should be made available to the Catchment Board for scientific purposes. Such information is, however, expensive to collect and has a commercial value which should be protected. As the system is now *user pays* perhaps some discount should be given for the information supplied for the public knowledge.

Water rights must also be obtained for an onshore exploration well. Generally requirements of the Catchment Board will be able to be met by the construction of appropriately sized holding ponds and other drainage works.

### **TOWN AND COUNTRY PLANNING ACT 1977**

Experience would suggest that the obtaining of town planning consent to use an area of land for an exploration well is generally not a problem provided the licence holder approaches the topic in a responsible and reasonable way, particularly the avoidance of glare from lights and the minimizing of noise where housing is nearby.

The drilling of the well KD1, or KA13 as it is now known, however, illustrates that obtaining town planning consent can be very important. That well was initially drilled as an exploration well but with the intention that it could be completed as a production well within the known Kapuni reservoir. From the outset therefore it was decided that the wellsite should be purchased. In that case, it was necessary to apply to the Hawera District Council for planning consent by way of a specified departure from the Operative District

Scheme. A nearby resident, who owned a greyhound establishment, objected to the application on the grounds that the drilling of the well would detract from the amenities of the neighbourhood and that it would unreasonably intrude upon his use and enjoyment of his land. From a practical point of view undertakings were given as to noise and lights and in the event town planning consent was granted. The objector however, still had open to him a right of appeal to the Planning Tribunal. He was aware that a drilling rig was already operating in the Kapuni field and was intended to be shifted to the site. Indeed, he was taken on a tour of the rig prior to the initial town planning hearing. In those circumstances he was aware that there would be considerable costs incurred if the rig was unable to proceed to spud the well. The objector, conscious of his rights to appeal, found himself in a very strong position with regard to negotiating the sale of his greyhound establishment. A mutually acceptable price was agreed upon, after much negotiation, and the Operator was able to maintain its timetable. As a post script to this saga a specified departure was sought to use the former greyhound premises and the objector's house for training and storage purposes and it has proved to be a valuable facility.

It has been suggested on occasion that as it is technically possible to drill deviated wells, which can reach a prospective target some distance from the surface location, that the industry should be more willing to undertake this activity. It is accepted that there will be occasions when such a decision is appropriate and sensible, however, the industry should not find itself forced into this position as a matter of course.

### **WAITANGI TRIBUNAL AND OTHER MAORI INTERESTS**

There is a paper to be delivered at this conference on the Waitangi Tribunal and its impact on the consent process. It is not therefore proposed to dwell on these matters in this paper.

It is important however, to acknowledge that Maori issues are of importance and must be addressed sensitively if the industry is to obtain the necessary community consent to its undertakings.

Apart from the Treaty of Waitangi issues, there has been a practice by at least some operators to recognise the interests of the Maori people in particular areas of operations. On at least one occasion a ceremony has been held on board the drilling unit at which the Maori Elders have lifted the *tapu* from the surrounding seabed.

It is to be hoped that the Government, as part of the Resource Management Law Reform, will accept that the satisfying of Maori claims to resources should be strictly between the Crown and the Maori people, without interference or impediment to the rights and activities of petroleum licence holders.

### **LABOUR CONSENTS**

It may seem odd to talk about labour consents in a paper dealing with environmental considerations in exploration. I do so deliberately because environment must be given a wide definition. A significant feature of oil exploration technology is the increasing sophistication of the equipment

used. This is particularly so in the offshore area. For the drilling of an offshore well it will be necessary to mobilise a drilling unit and supporting supply vessels.

As would be expected the contractor intending to provide a sophisticated drilling unit must at an early point, and prior to the commencement of work, give consideration to the manning of the unit. Included in that consideration will be the maximising of the employment of New Zealand personnel. The contractor will need to negotiate crewing arrangements with the relevant New Zealand Unions. It will be necessary to reach agreement as to which Trade Unions have coverage, e.g. is a semi-submersible accommodation unit a vessel therefore affording union coverage to the Maritime Cooks and Stewards Union, or is it an hotel therefore affording coverage to the Hotel Workers Union? Is a jack-up unit a barge when it is floating and a structure when it is jacked-up?

The manning levels for drilling units and other vessels will be subject to the closest scrutiny particularly by the Maritime Unions. The crewing numbers will need to be negotiated and it is in the nature of things that as each unit is different there will need to be specific negotiations on the terms and conditions for that new unit. From the Operator's perspective it is essential that it has at least an advisory role in the negotiation between the Unions and the contractor employer, which at any event will probably engage a manning agent, particularly as the Operator must be concerned to see that a proper balance is maintained in the conditions of work between the new and existing vessels in the formal industrial agreement and in any disputes which arise under that agreement.

The Operator has a wide on-going responsibility both to itself, and to others within the industry, to ensure that there is no undesirable flow-on effect into its total operation and that the contractor is dissuaded from the temptation to throw money at an industrial problem for which the Operator is likely to be liable to pay in any event, and which establishes a precedent unacceptable to the Operator.

For the contractor the employment of New Zealand personnel may create practical difficulties, especially for a contract of short duration, for example, a one well drilling campaign. The contractor may well have a trained and experienced crew which it wishes to retain and who are familiar with the operation of its drilling unit. The introduction of significant numbers of experienced, but unfamiliar, New Zealand personnel may reduce efficiency, and endanger the operation. An agreement as to the numbers and classifications of New Zealand Unions must be appreciated in a frank and open manner ; involving negotiating skills, diplomacy and fair-handed intent.

### HISTORIC PLACES ACT 1980

If an exploration project should involve modification of land controlled by the Historic Places Act 1980 then the consent of the Historic Places Trust will be required. The Trust is empowered to grant an authorisation, although there is a right of appeal to the Minister of Internal Affairs.

### COMMUNITY CONSENT

As already stated any exploration project requires careful planning. The earlier the better.

It is important for the successful undertaking of an exploration project for there to be an acceptance on the part of the wider community that the licence holder is a responsible organisation which is concerned to limit the impact of its development on the social and physical environment and that the licence holder can be seen to be a valued member of the community in which it operates.

The Kapuni 3D Seismic Survey, which was undertaken between the months of January and June of this year by Shell BP and Todd 0-1 Services Limited, on behalf of the Kapuni Mining Companies, is an example of what can be achieved with careful planning.

Although the Petroleum Act 1937 provided the *code* under which the operator was empowered to carry out this survey, much of the success that this project enjoyed was as a result of extremely good communication with all parties involved.

The technical aspects of this survey will be addressed in a paper to be given to this conference by Mr C. Bukovics. This paper will only address the interaction between the community at large and those who performed the work.

This seismic survey was carried out in one of the most intensive and productive dairying areas of New Zealand and the environmental considerations were considerable as the project involved:

- (a) The entry onto hundreds of properties.
- (b) Up to 150 personnel continuously on the move, both by vehicle and on foot.
- (c) Extensive use of a helicopter.
- (d) The carrying out of an intensive topographical survey including the pegging out of shot holes and receiving lines.
- (e) The laying out of thousands of kilometres of cables.
- (f) The drilling, loading with dynamite, detonating and re-storing of some 88 000 shot holes.

This survey was completed successfully on time and with no serious incidents involving either the work force or the environment.

This success was the result of careful and ongoing planning with the overriding strategy being to perform the work safely with proper consideration given to the interests of all third parties.

Consents were required under the Petroleum Act and its associated regulations and included the consent of the Chief Petroleum Inspector, the Department of Conservation, the local authorities (of which there were four), the Ministry of Transport, the Department of Labour (in relation to explosives), Maori Affairs Department, Taranaki Catchment Commission and most importantly, the property owners.

As much of the work was to be undertaken on farmland, careful consideration was given to the impact on farming operations. Consultation was undertaken with representatives of Federated Farmers and a Land Liaison Officer was employed. The timing of the project was designed to commence after hay making and to end prior to calving/lambing. A letter detailing the safeguards which would be put in place and the compensation that would be payable was forwarded to all landowners.

## CONCLUSION

In order to ensure that the farming community and wider community was fully aware of what was proposed, this being the first 3D survey ever undertaken in New Zealand, public meetings were convened and suitable brochures prepared. Good communication was maintained both by the Operator and its contractor throughout the project and emphasis was placed on safety in all aspects with training being provided for all levels of staff of both the operators and contractors.

It was appreciated that it was not enough simply to develop an efficient and safe operation, the community expected that there would be stringent and enforceable environmental safety requirements to ensure the safety and welfare of the construction force, the wider community and the physical environment.

As there was no serious incident involving the work force, the community or the environment, this project can be held up as an example of the industry setting objective standards and meeting them so that economic progress and environmental protection were complementary.

### ENVIRONMENTAL MONITORING

It is not sufficient for the Operator of a petroleum prospecting licence on obtaining conditional consents to proceed with its project without further reference to the conditions imposed. It is essential that there be an ongoing monitoring programme of the project from start to finish. Indeed, the tidying up of site at the conclusion of the work may well be the most critical aspect in avoiding permanent environmental damage.

Increasingly, Operators will employ individuals whose role is environmental management and control; both of the external conditional consents and internal guidelines. The employment of outside consultants to audit the Operator's compliance with these requirements is a worthwhile exercise. Recently such an environmental audit was undertaken by SIPM on the activities of Shell BP and Todd Oil Services Limited.

It should be an objective of every company in the industry to write into its mission statement, the priority in their operational requirements for proper regard to be had for the environment, safety and health. To succeed in this objective, management should plan and not act in a reactionary way. In-house environmental assessments should be conducted on all operations. Potential environmental exposures should be estimated and control measures incorporated into a project design. Contingency plans should be documented, tested, and widely promulgated. All of the foregoing being to encourage responsible stewardship.

The legislative and administrative regime for the protection of the environment, the allocation of natural resources and occupational safety and health is being subjected to the most sweeping review ever undertaken in New Zealand and change is inevitable.

Environmental considerations in petroleum exploration involve the licensing regime, regulation of the standards that ensure safe and efficient prospecting and an understanding of the specific environmental statutes relating to town planning, water and soil, clean air and the control of pollution of the sea.

The definition of the environment has expanded from simply the consideration of the physical environment to a more general consideration of the social and cultural environment, particularly the spiritual and cultural issues of the Maori people. Clearly, prospectors and more so developers will need to plan early and to seek suitable guidance on these matters in the future.

The Petroleum Act 1937 and its associated regulations has proved to be a workable legislative framework with a good relationship having been established between the industry and the Chief Petroleum Inspector. Where consents have been required outside of that legislation, experience has shown a need for reform. Prospectors and their contractors require a consistent timely and cost efficient regime; one clearly identifiable problem at present is that those who wish to object have a powerful weapon in their ability to cause delay through the judicial process.

The *user pays* philosophy, coupled with proposed changes to taxation will lead to increased costs on participants in petroleum exploration. Attempts to fund the costs of regulatory authorities on the back of the industry where those costs do not specifically relate to the operations of the industry must be resisted.

Explorers and contractors have shown that they are conscious of their responsibilities as members of the community and while the safety of their operations is a matter of the utmost self interest it complements the aims of those third parties who are concerned to protect the physical social and cultural environment for future generations.

In the area of environmental considerations much more will be achieved if the regime that is put in place for the future seeks to achieve co-operation between the industry, the Government and environmentalists. Such co-operation requires information, planning and communication.