

**STATEWIDE BENCHMARKING STUDY INTO ENVIRONMENTAL
AND OTHER IMPACTS OF THE QUEENSLAND
ENVIRONMENTAL PROTECTION ACT 1994
For Environmentally Relevant Activities**

**TECHNICAL REPORT
INTO BENCHMARKING ISSUES FOR
ADMINISTERING AUTHORITIES**

Department of Environment

by

*Australian National University
and
Mary Maher & Associates*

June, 1998



AUSTRALIAN NATIONAL UNIVERSITY



MARY MAHER
AND ASSOCIATES
ENGG

Table of Contents

Acknowledgements	
Executive Summary	
Summary of Recommendations	1
Background and Methods.....	6
1 Background and Overview	6
1.1 Four Phases of the <i>Environmental Protection Act 1994</i>	6
1.2 Milestones in <i>Environmental Protection Act 1994</i> Development and Implementation.....	7
2 Environmental Licensing and the Queensland <i>Environmental Protection Act</i> <i>1994</i>	9
2.1 Regulatory Framework.....	9
2.2 Environmentally Relevant Activities	11
2.3 Administering Authorities.....	12
3 Study Methods.....	14
3.1 Sample Selection.....	16
3.2 Risk Assessment.....	20
3.2.2 Assigning Potential, 1995 and 1998 Risk Ratings	21
3.2.3 Environmental Risk Areas	21
3.3 Response to Initiatives	22
3.3.1 Gap Analysis Method.....	22
3.4 Triangulation Survey.....	23
3.5 Open Ended Comments.....	23
3.6 Statistical Analysis	23
Findings	25
4 Overview of Findings	25
4.1 Environmental Risk and Risk Reduction.....	26
4.2 Operator Response to Initiatives	26
5 Cost of Environmental Protection	27
5.1 Compliance Costs.....	28
5.2 Relationship between Cost and Risk Reduction.....	29
5.3 Licence Fees.....	29
6 Environmentally Relevant Activities	31
7 Licence Types	33
8 Regional Issues	36
8.1 Comparing Regions.....	37
9 Environmental Risk Areas	40
9.1 Waste Recovery and Recycling.....	41
10 Information	42
11 Licence Structure and Conditions	45
12 Enforcement	48
13 Incentives	54

List of Tables

Table 2.1a Population of Level 1 Non-Devolved ERAs by Region	10
Table 2.1b Population of Level 1 Devolved ERAs by Region	10
Table 2.3 Environmental Initiatives by Type of Administering Authority	13
Table 3.1a: ERA Population and Sample Characteristics	17
Table 3.1b Sample of ERAs in the Benchmarking Study by Licence Type and Region	18
Table 3.1c Population and Sample Characteristics by Characterising Variables	19
Table 3.1d BCC Benchmarking Study Data Carried into Statewide Study	20
Table 3.2.1a Qualitative Measures of Likelihood	20
Table 3.2.1b Qualitative Measures of Consequence or Impact	21
Table 3.2.1c Risk Assessment Matrix	21
Table 3.2.3 Definitions of Environmental Risk Areas	22
Table 4 Summary of Statistical Analysis	25
Table 5.1 Environmental Investment and Budget Due to EP Act.....	28
Table 5.3 Patterns of Local Government Licence Fee Reductions	30
Table 6a Risk Reduction by ERA Type	32
Table 6b Residual Risk by ERA Type	32
Table 7 Potential Risk, Risk Reduction and Residual Risk by Licence Type	34
Table 8.1 Potential Risk, Risk Reduction and Residual Risk by Region.....	37
Table 12a Enforcement Options Used by Administering Authorities	49
Table 12b Summary of EP Act Prosecutions to June 1998	49
Table 13 Use of Incentives by Administering Authorities	57

List of Figures

Figure 1.1 Four Phase <i>Environmental Protection Act 1994</i> Process	7
Figure 1.2 Timeline of Selected Key Events in Queensland <i>Environmental Protection Act 1994</i> Development and Implementation.....	8
Figure 3 Benchmarking Study Process	15
Figure 5.3 Cost of Environmental Protection.....	30
Figure 6 Risk Reduction by ERA.....	31
Figure 8a Risk Reduction by Region.....	36
Figure 8b Total Environmental risk Reduction Model – Region (Regression)	37
Figure 9 Risk Reduction by Environmental Risk Area.....	40
Figure 9.1a Waste Disposal and Recycling Issues.....	41
Figure 9.1b Coordination within and between Government Agencies	41
Figure 10a.i Response to Guidelines.....	43
Figure 10a.ii Responses to Inspections	43
Figure 10a.iii Response to Industry Association Information.....	43
Figure 10b Information Sources for Environmental Issues	44
Figure 10c Compliance Standards and Guidelines	44
Figure 11a.i Clarity of Conditions.....	46
Figure 11a.ii Simplicity of Licence Administration.....	46
Figure 11a.iii IEMS Licence Structure	46
Figure 11b Forms, Conditions and Requirements.....	47
Figure 12a.i Responses to Consistent Enforcement.....	51
Figure 12a.ii Responses to EP Act with High Penalties	51
Figure 12a.iii Responses to EMP Provisions	51
Figure 12b Observed Non-Compliance.....	52
Figure 12c Comments about Enforcement.....	52
Figure 13a.i Responses to Marketing of Good Environmental Performance	55
Figure 13a.ii Responses to Links Between Environmental Protection and Efficiency.....	55
Figure 13a.iii Responses to Reduced Fees.....	55
Figure 13b Reasons for Not Polluting.....	56
Figure 13c Comments about Incentives.....	57

Statewide Benchmarking Study into Environmental and Other Impacts of the Queensland *Environmental Protection Act 1994* for Environmentally Relevant Activities

Executive Summary

Background

The Environmental Protection Act Statewide Benchmarking Study investigates and reports on the significant environmental outcomes made throughout Queensland as a result of the *Environmental Protection Act 1994* (EP Act). The Act commenced on 1 March 1995, introducing a new and comprehensive system for environmental protection in Queensland. A key feature of the EP Act is its requirement that operators of environmentally relevant activities obtain and comply with environmental authorities. The Benchmarking Study marks the completion of the fourth phase of the EP Act, and the start of the second iteration of EP Act phases. The four EP Act phases are shown in the diagram on the right.

The Benchmarking Study used a representative sample, involving 408 site inspections and interviews with operators of environmentally relevant activities to establish environmental and other impacts of the EP Act. Multiple regression analysis was used to determine relationships between features of environmentally relevant activities.

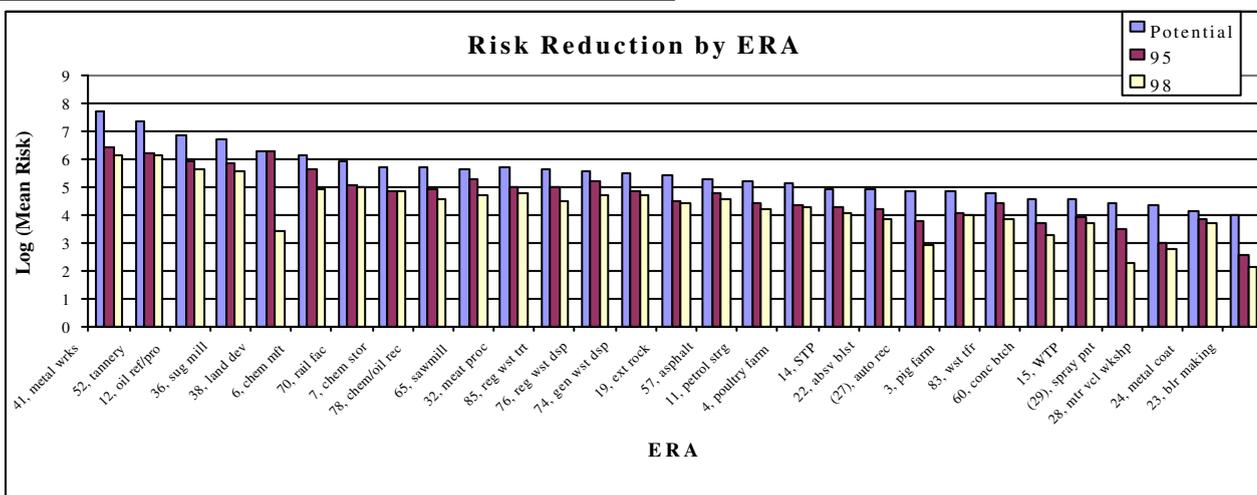
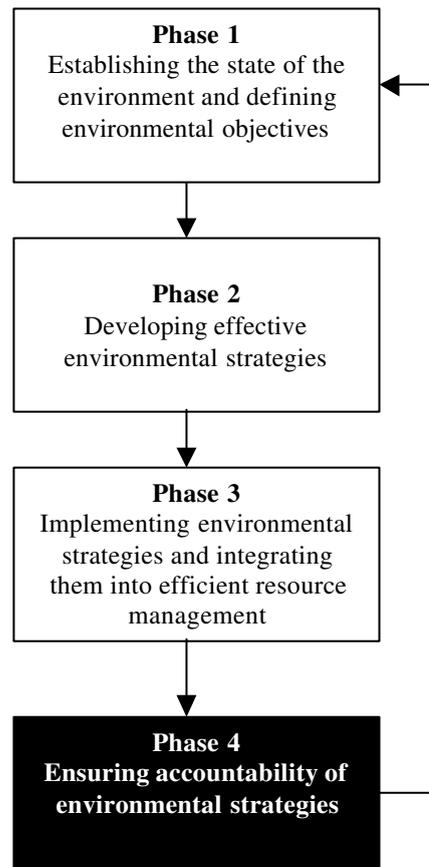
The Study investigates environmental risk and reductions in risk between 1995 and 1998 for a range of industry sector. The sectors sampled represent 53% of EP Act licences administered by the Department of Environment and 83% of those administered by local government. It also reports on operators' views of the importance and effectiveness of environmental protection initiatives, including:

- Information provided to operators on

Below: the Benchmarking Study reports on a 41% environmental risk reduction achieved between 1995 and 1998. Risk reductions were achieved by most sectors included in the Study

- The simplicity and clarity of the environmental licensing system;
- Enforcement; and
- Incentives.

Four Phases of the Environmental Protection Act



Findings

Key findings from the study include:

- A 41% environmental risk reduction was achieved overall by the industry sectors surveyed, as a result of the EP Act.
- Environmental risk in 1998 is at 19% of potential environmental risk for the sectors surveyed.

The Study identified features of environmentally relevant activities that best explain the observed differences in environmental risk, risk reduction, and residual environmental risk. Variations in these measures were found between Queensland Regions, integrated and single licences, urban and rural areas, and for different activities. The Study also found differences in environmental risk and risk reduction between different 'licence types', defined by the level of integration for non-devolved activities, and affiliations of devolved activities. However, environmental risk reductions were achieved overall by all licence types, single and integrated licence holders, in most of the industry sectors studied, and in all regions of Queensland.

There were also differences between licence types, in the proportion of operators that invested to comply with the environmental investments, and in the amounts spent on environmental improvements.

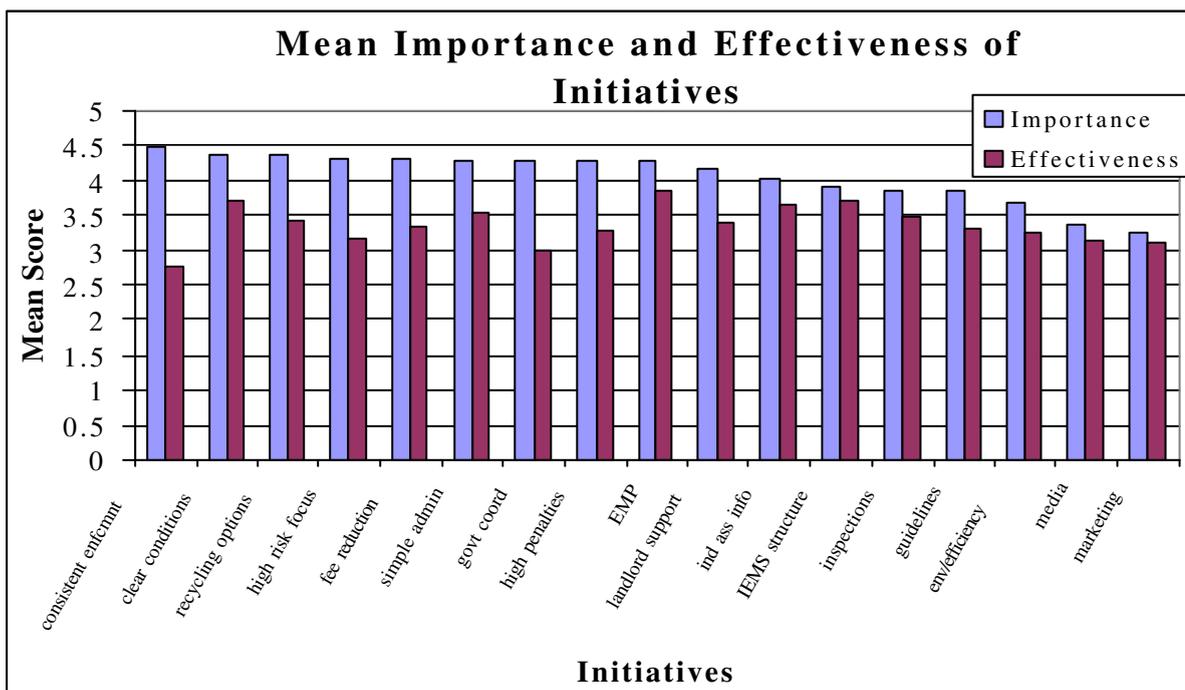
For example, 88% of activities with multiple environmentally relevant activities on one site (such as oil refineries and power stations) invested an average of \$185,200 to comply with the EP Act. This investment led to an average risk reduction of 28%, and has resulted in a residual environmental risk of 35% compared to potential risk.

Environmental outcomes came much more easily at the other end of the scale. Only 39% of small, unaffiliated environmental licence holders (such as motor vehicle workshops, and boiler makers) invested an average of \$3,400 in environmental improvements. This investment led to average risk reduction of 45% compared to 1995 levels, and left only 14% of risks on site unmanaged.

The relationship between environmental investments and outcomes was calculated for the industry sectors considered in this project. The relationship is most simply described as:

$$\text{Cost of environmental improvements} \propto \text{risk decrease}^{1.5}$$

This means that a 1% reduction in environmental risk will add 1.5% into baseline environmental compliance costs. A feature of this relationship is that the actual amount of both cost, and risk decrease varies depending on where an activity is on both scales. Knowledge of this relationship has the capacity to improve government sensitivity to business cost constraints in setting future environmental protection goals.

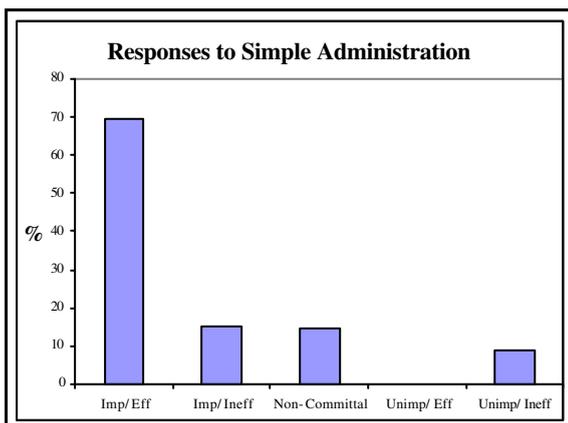


The majority of operators consider that the EP Act is both important and effective in encouraging better environmental performance. Specific features of the EP Act that were considered both important and effective included:

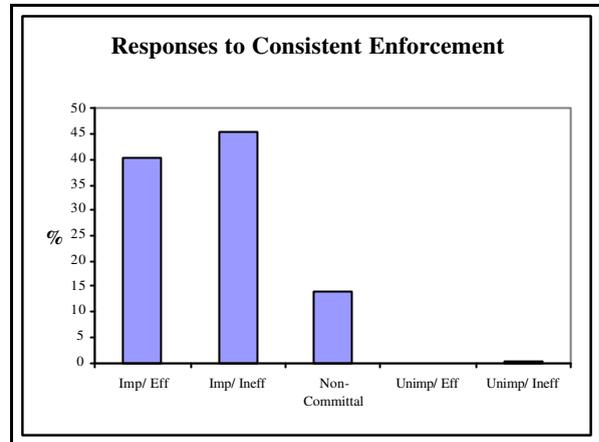
- The integrated environmental management system licenses, that are seen as beneficial in simplifying the licensing process and managing risks;
- Mechanisms such as Environmental Management Programs, that may provide legal protection to operators who report pollution incidents;
- Setting of clear licence conditions;
- Providing simple administrative systems for environmental licensing; and
- Granting licence fee reductions to operators with good environmental performance, and those facing financial hardship.

Despite overall satisfaction with many current environmental protection initiatives, operators identified many areas in which government could improve its delivery of programs, to support business viability or profitability while achieving further environmental outcomes. Key areas for improvement included:

- Setting clearer priorities for environmental protection, so that operators have more guidance in decisions they make to reduce potential pollution.
- Providing more consistent enforcement of environmental requirements, particularly in areas of high competition between licensed operators;
- Widely publicising the environmental outcomes achieved under the EP Act, so that operators and the general community are aware of the significant environmental improvements made;



- Assisting with marketing of good environmental performance to increase the benefits of compliance; and
- Addressing inequalities in the environmental protection system, so that potential polluters who are not required to be licensed under the EP Act are still encouraged to achieve equivalent environmental performance targets.



The majority of operators of Environmentally Relevant Activities consider consistent enforcement to be important in encouraging improved environmental performance. However more than half of these said they thought that enforcement had been ineffective. This may be attributed to the poor publicity that prosecutions have received. Also, low level enforcement options (such as on-the-spot-fines) have not been available to administering authorities. This has made enforcement of minor offences difficult. Operators also believe that not all polluters are being targeted with compliance requirements. Householders, backyarders mobile operators and farmers, were most commonly identified as failing to comply with standards now achieved by most environmentally relevant activities.

An overall theme that emerges from this Study is that obtaining support for tough new regulatory requirements requires the careful balancing of:

- Regulatory goals;
- The regulatory framework (including options for incentives, enforcement and other system components);
- Local and regional economic and other conditions (including the degree of competition between activities); and
- The pace of reform.

In the case of the EP Act, the entire regulatory framework has still not been put in place, and regulatory goals have not yet been clearly stated or communicated to ERA operators. Dissatisfaction with the EP Act has been the result in areas where the pace of reform pushed operators beyond the capacity of government systems to meet emergent needs.

There is evidence that operators in the South East Region, and unaffiliated devolved activities have been most affected by a pace of reform that outstripped other emergent needs. In other areas, such as South West Queensland, and for multi-ERA IEMS operators, the pace of reform has kept in line with emergent needs, and there is less evidence of dissatisfaction. Environmental outcomes were still achieved in these areas.

Recommendations

- Prepare new Environmental Protection Policies to meet emerging needs
- Increase low level enforcement options, communication of enforcement outcomes and assistance with identifying and solving compliance issues
- Provide more meaningful incentives to operators, to substantially increase the benefits of compliance
- Clarify environmental protection priorities. Clearly communicate priorities to operators in relevant, technical, practical terms
- Increase the clarity and simplicity of environmental licensing systems, for both administering authorities and operators
- Build on strengths and address weaknesses of Integrated Environmental Management Systems licensing
- Recognise the different needs of various groups of small operators. Target initiatives to meet these needs
- Build an environmental protection system that is sensitive and flexible to regional and other geographic differences, yet provides consistent environmental outcomes both across and within regions
- Support industry sectors with special compliance issues or needs
- Improve communication of the outcomes from the EP Act to operators of environmentally relevant activities, administering authorities and the general community

Acknowledgments

Report by Su Wild River, Australian National University, Centre for Resource and Environmental Studies: project and methodology design, sample design, project management, mechanics of response to initiatives methodology, site inspections, defining outcomes of statistical analysis, report writing.

In collaboration with

Laura Hahn, Mary Maher & Associates: mechanics of risk assessment methodology, assistant project management, site inspections, selected report writing, editing and other specialist technical input.

Ross Cunningham, Australian National University Statistical Consulting Unit: design and quality control of statistical analysis.

Greg Miller, Envirotest: overview of risk assessment methodology, site inspections, contributions to report.

Geoff Renouf, Envirotest: site inspections, contributions to report.

Trevor Brown, Hyder Consulting: Peer review and review of project management strategy

Christine Donnelly, Australian National University Statistical Consulting Unit: statistical data analysis.

Bernadette McNevin: database design, data delivery.

Elizabeth Stanmore, Mary Maher & Associates: survey strategy, survey support, some data coding, contributions to report.

Meg Dickson: Assistance with survey strategy.

Thanks

To site operators and managers who participated in the survey.

To Department of Environment and Heritage, Environment Division Managers in Regional and District Offices.

To the Local Government Association of Queensland, especially Peta Jamieson.

To participating local governments, including:

Brisbane City Council

Bowen Shire Council

Cairns City Council

Caloundra City Council

Chinchilla Shire Council

Crow's Nest Shire Council

Gatton Shire Council

Logan City Council

Mareeba Shire Council

Pine Rivers Shire Council

Pittsworth Shire Council

Redcliffe City Council

Redland Shire Council

Roma Town Council

Tara Shire Council

Toowoomba City Council

Townsville City Council

To Pauline Jacob and Rachel Hinsch, Department of Environment, for tireless practical assistance in supporting this project.

To Mike Whittaker, Department of Environment, for progressing quantitative, independent research into the effectiveness of environmental regulation.

To Brisbane City Council, for permission to use BCC data and methods in this Study.

To Steve Dovers, Centre for Resource and Environmental Studies, for advice and support, and to Toni von Finglebaum-Smythe for patience and encouragement.

Based on the *Brisbane City Council Environmental Benchmarking Study*, 1997, by Su Wild River

**STATEWIDE BENCHMARKING STUDY INTO ENVIRONMENTAL
AND OTHER IMPACTS OF THE QUEENSLAND
*ENVIRONMENTAL PROTECTION ACT 1994***

1.1 For Environmentally Relevant Activities

**TECHNICAL REPORT
INTO BENCHMARKING ISSUES FOR
ADMINISTERING AUTHORITIES**

Department of Environment

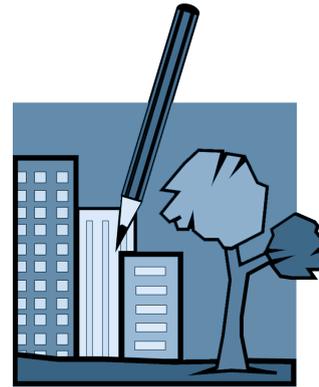
by

*Australian National University
and
Mary Maher & Associates*

June, 1998



AUSTRALIAN NATIONAL UNIVERSITY
Summary of Recommendations
Statewide Benchmarking Study



MARY MAHER
AND ASSOCIATES
Pty Ltd

Environmental Protection Policies

Goal: Develop new Environmental Protection Policies to meet emerging needs

- Consider an Environmental Protection Policy for enforcement, that spells out low level offences for minor environmental offences, considering the following new offence provisions:
 - breach of licence conditions not involving environmental nuisance (or harm) as an on-the-spot fine of around \$100 as a first offence, with fines increasing with subsequent cases of observed non-compliance;
 - equivalent on-the-spot fines for backyarders, householders, farmers and other groups among which non-compliance is commonly observed;
 - breach of licence conditions involving environmental nuisance, as a bigger on-the-spot fine (eg between \$500 and \$1000); and
 - delayed on-the-spot fines with a warning mechanism, so that operators can avoid the fine if problems are addressed within a specified (short) time period.
- The Environmental Protection Policy for Enforcement could also:
 - incorporate and formalise the DoE Enforcement Guidelines;
 - establish a range of small-to medium scale enforcement options;
 - identify circumstances appropriate to their use; and
 - provide some flexibility in application at the local or regional level.
- Develop components of Environmental Protection Policies to address regional issues. These would each:
 - define goals for regional environmental protection (possibly in terms of environmental risk);
 - identify industry sectors with significant compliance problems in each region, and formalise goals and strategies to address these problems;
 - identify economically depressed areas or sectors that may need special assistance to achieve compliance;
 - contain strategies for meeting statewide goals, so that pollution havens do not develop at the regional level;
 - identify regional priorities for enforcement, incentives, information and for simplicity and clarity of licence structure and conditions;
 - formalise the regional partnership between state and local government for the implementation of the EP Act; and

- be developed at the regional level, requiring additional staff in each region.
- Consider developing an 'Incentives' Environmental Protection Policy. This would:
 - have an overall goal of making the benefits of compliance greater than the costs;
 - establish a service to provide advice to ERA operators, on low-cost solutions to environmental problems. This could be provided by trained and experienced personnel responding to requests for assistance by operators. The service would be separate to any enforcement system so that operators could safely seek advice. The service should be available to operators licensed by both local and state government; and
 - contain hardship provisions and technical information to provide simple, cost-effective pathways to compliance. These would be pitched at operators at risk of closure due to the financial implications of meeting environmental requirements. Information would facilitate the identification of realistic and practical actions that could be taken to avoid environmental harm (simple ways to meet the general environmental duty).
- Develop a 'Goals' 2008 Environmental Protection Policy. This would:
 - establish a 10 year time frame for environmental protection, aiming to provide realistic time frames, and clear priorities to operators;
 - further formalise DoEs role as lead agency for the environment, and link to corporate planning issues;
 - identify activities with high residual environmental risk, that will have furthest to progress to meet goals. Target government resources to provide particular assistance, advice and flexibility to those operations; and
 - provide a mechanism for regular reporting on progress towards goals.

Enforcement

Goal: Increase low level enforcement options, communication of enforcement outcomes and assistance with identifying and solving compliance issues.

- Address problems with Enforcement. For example:
 - provide information to operators about enforcement mechanisms and scope related to their particular environmental offences;
 - balance the enforcement of environmental requirements for ERAs and non-ERAs. Avoid 'petty' enforcement actions (for example avoid enforcement action when an equivalent action by a householder or backyarder would not incur a penalty);
 - continue site inspections, with an emphasis on enforcing licence conditions to ensure that complying operators are not financially disadvantaged compared to non-complying operators;
 - consider options for self-funding, including introducing site inspection fees to cover costs of extra assistance; and
 - bring in more low level enforcement options for all types of offences.

Ensure that any new enforcement options are urgently provided to all local government administering authorities, as well as the state government, with training to facilitate consistent application.

Communicate the outcomes from enforcement broadly, to operators and the general community, including consideration of publicising the results of enforcement actions, including through public notices in newspapers.

Incentives and Cost of Compliance

Goal: Provide more meaningful incentives to operators to substantially increase the benefits of compliance.

- Increase the benefits of compliance within operations. For example:
 - recognise the potentially high costs of compliance for operators of all licence types, and that the majority of operators perceive few practical benefits from compliance;

- assist operators to perceive practical benefits from compliance, by drawing links between productive efficiency and environmental protection;
 - develop a system to enable environmentally responsible operators to market themselves on the basis of good environmental performance. The system should build on existing 'green licence' marketing systems, but be recognisable across administering authority boundaries (for instance, use a consistent symbol to designate operators who are meeting all environmental requirements);
 - provide community education on reasons and ways to identify and support good environmental performers;
 - further refine existing incentive licence systems, to provide a system that could readily be adopted and administered by any administering authority; and
 - directly support good environmental performers through government purchasing policies (with regard to price and environmental accountability).
- Decrease the costs of compliance within operations. For example:
- review licence conditions that require costly actions beyond the scope of the general environmental duty, where the residual risk of environmental harm is low; and
 - provide training for inspectors in least-cost options for environmental protection. These options may be based on either management or infrastructure systems (for example, consider the relative effectiveness of dirt and concrete bunding, and identify conditions under which the lower cost, dirt option is acceptable).

Information to Operators

Goal: Clarify environmental protection priorities. Clearly communicate priorities to operators in relevant, technical, practical terms.

- Clarify technical detail and prioritise compliance issues in standards, guidelines and codes of practice.
- Target information better to different licence types (level of integration), and to groups that are most dissatisfied with the information that is currently provided. Undertake regular (eg annual) surveys of operators to assess responses to initiatives, for continual improvement to the effectiveness of the regulatory system.
- Ensure inspectors are adequately trained and experienced with issues related to particular industry sectors. Provide a system of mentoring new authorised persons, including more ongoing technical training for authorised persons.
- Increase consistency of standards, particularly within local or regional areas, so that operators in competition with one another have consistent requirements.

Consider using government skills and experience from outside the existing environmental protection networks where available and appropriate. For example, this could include inter-agency partnerships, such as DoE liaison with local government trade waste officers to find better solutions to trade waste issues. It might also include greater use of DoE officers by local governments for technical advice on issues less commonly encountered by local governments.

Develop a report on EP Act outcomes, pitched at ERA operators and the general public. An outline of such a report is provided as an attachment to this Report.

Clear and Simple Licensing

Goal: Increase the clarity and simplicity of environmental licensing systems, for both administering authorities and operators

Recognise that the natural distinction in environmental risk levels and response to initiatives among ERA operators is between IEMS and non-IEMS, and not only between devolved and non-devolved activities. Target initiatives to consider this distinction.

Take steps to increase the simplicity and clarity of the licence system, which:

- make use of environmental risk assessment, including the methodology used in this report for percentage risk reduction, and residual risk, to clarify environmental licensing goals;

- use Central Coast, Central Office and Northern Region licences as models of clear and simple licences, and compare these to licences and conditions issued in the South East Region;
- further investigate and address the clarity and simplicity of the EMP system. Consider developing alternative EMP provisions for low-risk compliance issues. In these cases, build more flexibility into the system (including the capacity for EMP amendment at the local or regional level), and develop administrative systems to make it more accessible as an enforcement tool to be used by local governments, especially for small-scale (non-IEMS) operations; and
- consider policies and procedures to apply specific, rather than general, educative conditions onto operators. This could be particularly beneficial when administering authorities have had a low level approach to EP Act implementation.

Support Large Operations with Environmental Protection

Goal: Build on strengths and address weaknesses of Integrated Environmental Management Systems licensing

Address weaknesses of integrated licensing by:

- targeting information to meet corporate environmental management information needs, recognising that many IEMS operators employ environment professionals, capable of dealing with complex technical detail; and
- recognising IEMS as both a vehicle for environmental licensing and a management tool. Consider shifting away from blanket conditions that restrict innovation, to management conditions that support flexibility.

Enhance strengths of integrated licensing. For example:

- support training systems brought in by IEMS operators to ensure organisational level compliance;
- recognise organisational level improvements, including better management systems for identifying, reporting and addressing environmental compliance problems; and
- recognise practical outcomes achieved by IEMS licensees, the high cost of these improvements, and the need for government priorities for environmental protection to be clearly defined.

Support Small Operations with Environmental Protection

Goal: Recognise the different needs of various groups of small operators. Target initiatives to meet these needs

Recognise the low potential risk, high risk reductions and resulting low residual risk now common for small ERA operators in most sectors. For example:

- target enforcement at those non-complying operators who could undercut complying competitors, and sectors with disproportionately high residual risk; and
- target incentives at those complying operators most at risk of competitive disadvantage due to non-complying competitors.

Consider non-IEMS, non-devolved licences as possible future devolved or delegated ERAs, since they have had similar responses to the EP Act (in terms of environmental risk levels and responses to environmental initiatives).

If further devolution or delegation occurs, licence fees listed in the EP Regulation should not be automatically reduced during this process.

Recognise the different information needs of different types of small operations (as well as differences in information needs between small and large operations). Target unaffiliated devolved activities with specific, clear, practical information.

Address Regional and other Geographic Issues

Goal: Build an environmental protection system that is sensitive and flexible to regional and other geographic differences, yet provides consistent environmental outcomes across and within regions

Reconsider the goal of regional consistency. This should be defined as consistency in outcomes, not consistency in how these are achieved. This would require clearer strategic statewide goal definition.

- Develop simple, technical information on key compliance issues, giving options to assist operators to achieve compliance in different environmental and operational circumstances. This could be done through environmental risk assessment as in this Study.
- Facilitate or support more policy development at a regional level for the translation of the statewide goals into information sheets, or other regional documents. This would require additional regional resources, possibly relocated from Central Office.
- Involve local government and industry directly in the development of appropriate site-based options to meet statewide goals at a regional level.

Recognise Special Issues Facing the Waste Industry Sector

Goal: Support industry sectors with special compliance issues or needs

Recognise the need to support the waste recovery industry. For example:

- consider options for industry sponsorship within the recycling industry. These would aim to keep the cost of the best environmental management option lower than or equal to that of alternatives that are inconsistent with waste minimisation;
- consider industry sponsorship to encourage the use of environmental best practice in waste management; and
- recognise that where recycling options are zero cost, those options are used almost universally. Consider government opportunities to provide or support zero cost recycling systems.

Report Environmental Protection Outcomes

Goal: Improve communication of the outcomes from the EP Act to ERA operators and the general community

Remove the inconsistencies in the annual report, so that the following information is reported each year:

- number of new environmental authorities issued; and
- total number of ERAs licensed by each administering authority (use a best estimate based on previous years if not provided by administering authorities);

That information reported in the annual report be expanded to also include the factors shown up in this Study to have explanatory value in understanding the impact of the EP Act. These factors would include:

- licence type (as defined in this Study);
- centrality of the area in which activities are undertaken (in Brisbane, the metropolitan fringe, provincial centres or rural areas);
- licence fees charged, or licence fee policy of administering authorities;
- administering authority policy for setting licence conditions (specific or educative); and
- approach of administering authority to implementing the EP Act (low, moderate or high level approach as defined for the purposes of this Study).

Part I: Background and Methods

2 Background and Overview

The *Statewide Benchmarking Study into Environmental and Other Impacts of the Queensland Environmental Protection Act 1994* (the Study) reports on the outcomes from the first three years operation of the Queensland *Environmental Protection Act 1994* (EP Act). The main focus of the Study is on the environmental risks, and risk reductions by Environmentally Relevant Activities (ERAs), and the response of operators to government environmental protection initiatives. The Study also focuses on the state of environmental management in mid 1998, and provides benchmarks to assist environmental goal setting during subsequent phases of the EP Act process for achieving its object of ecologically sustainable development. The Study assessed outcomes from the EP Act through:

- rigorous sampling of environmentally relevant activities to ensure representativeness of findings;
- environmental risk assessments through accompanied site inspections at 408¹ ERAs;
- interviews with activity operators about the importance and effectiveness of government environmental protection initiatives; and
- statistical analysis of data to determine the nature of relationships between aspects of EP Act implementation.

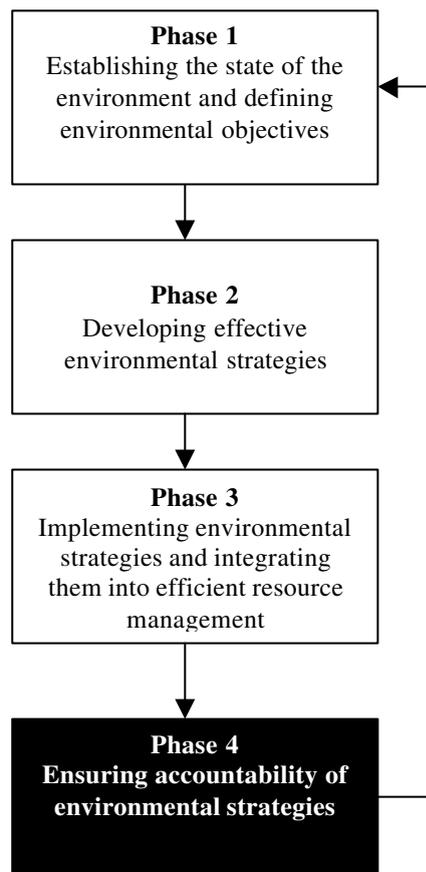
This Technical Report aims to provide administering authorities and other key stakeholders in environmental protection with details on implementation outcomes, and key opportunities to improve environmental regulation in Queensland. Additional detail on the study methods and statistical analysis is provided in the Benchmarking Study *Scientific Report on Detailed Methods and Findings*.

2.1 Four Phases of the *Environmental Protection Act 1994*

The Object of the EP Act is to achieve ecologically sustainable development. This object is defined in Section 4, as “protect[ing] Queensland’s environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends”(EP Act, Section 4). The EP Act establishes a circular, four-phase process to meet this object. The four phases are pictured in Figure 1.1 below.

¹ The total number of activities identified as being included in the sample varies depending on the question being asked. This is because some issues were not relevant to all operators, and because of the way in which the data from the Brisbane City Council Environmental Benchmarking Study were built in. Further information on this is provided in Section 3.2 of the *Scientific Report on Detailed Methods and Findings*.

Figure 1.1: Four Phase *Environmental Protection Act 1994* Process



This Benchmarking Study addresses Phase 4 requirements of the EP Act process, by reporting on the outcomes of environmental regulation, and describing strengths and weaknesses of EP Act implementation to date. The Study also aims to contribute to the next iteration of the EP Act, by assisting the definition of future environmental objectives, and suggesting environmental strategies to develop and augment those already in existence.

2.2 Milestones in *Environmental Protection Act 1994* Development and Implementation

Figure 1.2 below is a timeline of selected key events in EP Act development and implementation since 1991. It is worth noting that although all four of the EP Act phases have been addressed by a range of events, the phases were interspersed with one another, rather than occurring in a logical sequence. In particular, key phase 1 events such as the completion and commencement of Environmental Protection Policies did not occur until very late in the process. Some important environmental strategies, including low-level enforcement options such as on-the-spot fines are yet to be provided to most administering authorities.

**Figure 1.2: Timeline of Selected Key Events in Queensland
Environmental Protection Act 1994 Development and Implementation**

- **1991-92**
 - First consultation to prepare the EP Act (4):
 - 10,000 kits containing Public Consultation Papers distributed (4);
 - first draft schedule of premises to be licensed under the EP Act distributed (4);
 - scoping draft of proposed Environmental Protection Policies for Water, Air and Noise (4);
 - 60 meetings, attended by over 1,100 people, in 32 locations around Queensland (4); and
 - Key stakeholders working group, with industry, local government and community reps established (4)
- **1992-93**
 - Major drafting of proposed EP Act (2)
- **1993-94:**
 - Major consultation on proposed EP Act with industry, local government and community (4)
 - Development, publication and distribution of guidelines to support the proposed EP Act, including:
 - enforcement (2);
 - environmental management programs and (2); and
 - environmental due diligence (2).
 - 1st \$500,000 grant to local governments to assist system development to support EP Act (3)
- **1994-95**
 - Environmental Protection Bill introduced, September 1994 (2)
 - Environmental Protection Act passed, December 1994 (2)
 - Commencement of EP Act and Regulation, March 1995 (2)
 - Protocol for state and local government partnership in implementing EP Act signed (2)
 - Fee relief system for devolved activities. Government subsidised licence fees for first year (3)
 - Discussion Draft of Environmental Protection (Water) Policy, 1995 (1)
 - Discussion Draft of Environmental Protection (Air) Policy, 1995 (1)
 - 2nd \$500,000 grant to local governments to assist system development to support EP Act (3)
 - Environmental Protection Support Kit developed and distributed to administering authorities (2)
 - Industry-specific Operators Environmental Guidelines, licence checklists and other resources developed and provided to all administering authorities (predominantly by DoE and Brisbane City Council) (2)
 - 1st Environmental Management Programs commenced (3)
 - 1st EP Order issued (3)
 - 1st EP Act prosecution commenced (3)
- **1995-96**
 - Ministerial Advisory Committee established (4)
 - Discussion Draft of EP (Noise) Policy, 1996 (1)
 - EP (Interim Waste) Regulation, May 1996 (1)
 - Updating and re-signing of Protocol for state and local government partnership for EP Act (2)
 - Moratorium on licence actions and continuation of fee relief system for additional 4 months (3)
 - 3rd \$500,000 grant to Local Governments to assist system development to support EP Act (3)
 - Completion of first successful prosecution by South East Region DoE (3)
- **1996-97**
 - EP Council of Queensland established (4)
 - 1st incentive licences issued by South East Queensland local governments (3)
 - Waste exchange register pilot on LGAQ-Net in Maryborough district (3)
 - EP Act amended three times (2)
 - EP Regulation amended four times (2)
 - EP (Water) Policy commenced (1)
 - EP (Noise) Policy commenced (1)
 - Brisbane City Council Environmental Benchmarking Study shows outcomes achieved by EP Act (4)
- **1997-98**
 - EP (Air) Policy commenced (1)
 - On-the-spot fine trial commenced by selected DoE offices and Local Governments (3)
 - LGAQ-Net supported as a major communication facility for EP Act. Local Government officers implementing EP Act assisted with connections to LGAQ-Net (2)
 - Contaminated Land Act brought into EP Act framework (1)
 - 1st code of practice recognised under the EP Act, for Agriculture (1)
 - EP Regulation 1998 replaces Interim Regulation (redefining some ERAs) (2)
 - EP Act Statewide Benchmarking Study (4)

Note: Bracketed numbers indicate EP Act Phase addressed by event (even if event occurred before EP Act commencement).

Wild River, S. 1998,
Sources: Department of Environment Annual Reports, EP Act Annual Reports,
EP Act, Regulations and Policies,
Personal communication with various stakeholders

3 Environmental Licensing and the Queensland *Environmental Protection Act 1994*

This section outlines some critical components of the EP Act regulatory framework, and describes administering authority roles, and environmentally relevant activity (ERA) characteristics.

3.1 Regulatory Framework

The regulatory framework for the EP Act consists of:

- the *Environmental Protection Act 1994* itself;
- EP Regulations;
- environmental licences;
- Integrated Environmental Management Systems (IEMS²) provisions;
- EP Policies; and
- Codes of Practice.

Other non-regulatory system components include a range of guidelines, policies and other information to support environmental regulation. This section briefly describes each part of the framework.

The EP Act is framework legislation, establishing a broad and flexible system for more detailed policy development and implementation. In this way, the EP Act sets out the purpose, scope and limitations of all other components of the regulatory framework.

Some key features of the EP Act framework for achieving ecologically sustainable development are that it:

- recognises DoE as the lead agency for the environment;
- decentralises environmental administration through provisions to delegate powers for EP Act implementation to other state government departments or local government, and to devolve responsibilities to Local governments;
- establishes a general environmental duty, requiring that reasonable and practical measures be taken to prevent or minimise environmental harm from actions;
- requires government agencies to consider a range of criteria, to ensure that all (and only) reasonable and practical measures are taken to reduce environmental harm;
- defines three levels of environmental harm, including qualitative and quantitative features;
- establishes a system for licensing of activities that will or may cause the release of contaminants into the environment when they are carried out; and
- establishes a system of flexible enforcement options, including significantly higher penalties for serious environmental offences than were common under previous legislation.

The EP Regulations set out the working detail of the systems for environmental licensing. During the first three years of EP Act implementation, these regulatory functions were provided in the *Environmental Protection (Interim) Regulation 1995* (the EP Regulation). The EP Regulation expires on 1 July 1998, to be replaced by the *Environmental Protection Regulation 1998*³. The EP Regulation defines ERAs and identifies their administering authorities. It also identifies which ERAs are Level 1 (requiring a licence and annual fee) and Level 2 (requiring an approval with a one-off fee). The EP Regulation also serves other functions, such as:

- replacing and subsuming previous *Ozone Regulations*;

² For simplicity, licences covering IEMS are referred to as IEMS licences.

³ Because the transition from the *EP (Interim) Regulation 1995* to the *EP Regulation 1998* will be after the completion of this Study, all references to the Regulation, including ERA names and numbers relate to the *Environmental Protection (Interim) Regulation 1995*.

- listing approved Codes of Practice;
- setting fees for environmental licensing and other EP Act charges; and
- prescribing a list of regulated wastes.

Tables 2.1a and b below show that one of the major outcomes from the EP Regulation is the scope of environmental licensing it has brought about. Table 2.1a shows the total number of non-devolved ERAs licensed in Queensland as of May 1998 (with the exception of the 498 licences administered by the Department of Minerals and Energy). Table 2.1b gives an estimate of the total number of ERAs administered by local government (devolved ERAs).

Table 2.1a: Population of Level 1 Non-Devolved ERAs by Region

ERA #s	Description	FN	N	CC	SW	SE	CO	Total
1-4	Agricultural Activities	28	23	16	29	12	2	120
5-12	Chemical, coal and petroleum products	15	92	58	29	120	2	316
13-14	Community infrastructure and services	52	75	75	62	106	9	379
15-17	Electricity, gas and water supply activities	7	32	44	37	84	1	205
18-21	Extractive activities and mining	44	116	75	53	201	23	513
22-28	Fabricated metal product activities	27	32	61	33	62	19	235
29-37	Food processing	11	15	27	22	71	1	147
38-39	Land development and construction	0	0	1	0	0	0	1
40-42	Metal products activities	8	19	18	7	48	3	108
43-55	Miscellaneous activities	9	8	23	20	42	5	107
56-62	Non-metallic mineral product manufacture	4	16	7	9	33	5	74
63	Recreational sporting activities	0	0	0	0	1	0	1
64-66	Sawmilling, woodchip, and wood prod man	1	9	45	36	55	2	148
67-72	Transport and maritime services	14	43	25	4	26	2	114
73-76	Waste disposal	54	60	79	79	98	11	381
77-81	Waste recycling and reprocessing	3	13	6	2	25	0	49
82-83	Waste transport	25	21	25	13	66	7	157
84-85	Regulated waste treatment and storage	14	18	23	21	56	1	133
Totals		316	593	609	466	1006	93	3,183

Sources: Department of Environment and Department of Primary Industries Public Registers

Note: does not include 498 ERA licences administered by the Department of Minerals and Energy

FN = Far Northern Region

N = Northern Region

CC = Central Coast Region

SW = South West Region

SE = South East Region

CO = DOE Central Office

Table 2.1b: Population of Level 1 Devolved ERAs by Region

ERA	FN	N	CC	SW	SE	Total
22 – Abrasive Blasting	9	47	28	19	57	160
23 – Boiler Making/Engineering	100	182	171	164	522	1,139
24 – Metal Surface Coating	23	88	71	118	322	622
25 – Metal Forming	21	70	66	73	504	734
26 – Metal Recovery	18	44	45	36	139	282
28 – Motor Vehicle Workshop	371	664	736	729	3,444	5,944
60 – Concrete Batching	31	36	61	43	133	304
All other devolved ERAs	92	158	20	129	1,092	1491
Total	665	1,289	1,198	1,311	6,213	10,676

Sources: compiled from 1995, 95-96 and 96-97 EP Act Annual Reports

Environmental licences are an important part of the EP Act regulatory framework for several reasons, including:

- they provide the scope of environmental protection powers devolved to local governments under the EP Act. Local governments can use any EP Act power in dealing with any devolved activity operating in their area;
- licensing provides a driver for authorised persons to go on site at ERAs, to identify environmental risk and management issues;
- they provide a source of revenue to administering authorities that assists in delivery of environmental protection programs; and
- they provide an opportunity for administering authorities to set operating conditions aimed at avoiding environmental harm.

Another part of the EP Act Regulatory framework that is a key feature of environmental licensing is the IEMS provisions. These allow operators who carry out more than one activity to apply for a single licence covering multiple ERAs. To receive an IEMS licence, an applicant must prepare a submission detailing how they propose to manage the environmental impacts of the activities. This must include consideration of:

- the monitoring of releases of contaminants into the environment and an environmental assessment of the releases;
- staff training and awareness of environmental issues;
- the conduct of environmental and energy audits; and
- waste prevention, treatment and disposal (EP Regulation Section 42).

An important benefit is that the licence fee for an IEMS is calculated as the single most expensive licence fee for any component ERA, rather than the sum of those fees. The savings in licence fees reflect the additional effort that operators put into considering organisational level environmental issues, during development of the IEMS application. Depending on the approach of administering authorities, this effort by operators means that less administrative effort is required for IEMS licences by the administering authority.

EP Policies have yet to be implemented as significant elements of the regulatory framework for environmental protection in Queensland. EP Policies were designed to identify environmental values to be protected or enhanced through implementation of the EP Act. Throughout the development of the EP Act, EP Policies were expected to be the source of compliance standards and measures designed to protect the environment, or minimise the possibility of environmental harm (EP Act Section 25). The value of the EP Policies has been constrained by their completion after most licences were already in place. In addition, it is the common view of authorised persons that EP Policies that have finally been put in place do not provide simple, clear compliance standards with direct application to ERAs or administering authorities.

Codes of Practice are another element of the EP Act regulatory framework whose value has yet to be fully realised. These provide a potential vehicle for industry self-regulation, and direct participation in setting environmental protection standards. EP Act Codes of Practice state ways of achieving compliance with the general environmental duty. Because of this, they could provide considerable certainty about ways of achieving compliance.

3.2 Environmentally Relevant Activities

ERAs are a highly varied group of activities, ranging from very large and complex operations with many sources of possible contaminant release to the environment, to simple, small activities with few potential contaminants. During the site inspection process, auditors working on this Study identified six functional types of ERAs, which are defined below. Summary terms for these licence types are:

- multi-site IEMS;
- single site IEMS;
- non-devolved non-IEMS;
- devolved affiliated;
- devolved unaffiliated; and
- local government IEMS.

Auditor perceptions were that these different types reflected differences in environmental risk, risk reduction and response to initiatives. Statistical analysis (described below) confirmed these as useful working categories. For simplicity, the licence types are used to briefly describe ERAs.

Multi-site IEMS operations include activities such as railway facilities, with logical, organisational links between activities in different areas. These often cross local, and even regional boundaries.

Single site IEMS operations include the largest and most complex ERAs, such as power stations, and oil refineries. They often include a primary ERA, with other ERAs on site to support that activity. For instance, an activity with the main purpose of refining sugar may also include a sewage treatment plant, used for treating high nutrient wastes from that primary activity.

Non-devolved non-IEMS licences comprise the smallest and simplest of those licensed by DoE. Fuel storages, and sawmills were two non-devolved activity types that are frequently carried out as single ERAs.

Devolved affiliated activities were those activities licensed by local governments, that had connections to parent companies, franchises or other company structures. Most concrete batching plants were affiliated to some parent company or franchise, such as 'Pioneer', or 'Boral'. Some operations from other devolved categories were also affiliated.

Devolved unaffiliated activities were those activities licensed by local governments, that had no connections to parent companies, franchises or other broader company structures. Motor vehicle workshops, spray painters and metal workers were frequently unaffiliated devolved ERAs.

Local Government IEMS are a distinctive set of IEMS for several reasons. Local governments generally operate a consistent set of ERA types for each urban centre. These usually include a:

- sewage treatment plant;
- water treatment plant; and
- landfill;

Most local governments also operate a workshop and several small quarries, and may also have a range of other ERAs. Local government IEMSs are therefore most often multi-site, and also include multiple ERAs on some sites. DoE has supported local government IEMS development through training and the provision of specialist information.

3.3 Administering Authorities

The discussion above has already outlined some features of administering authorities, including the introduction of a Study focus on DoE and local government administering authorities. Other features of administering authorities that provide necessary background for understanding project findings include the approach these authorities have had to in the development of various environmental initiatives. Major features of initiatives used by each administering authority are summarised in Table 2.3 below.

Table 2.3: Environmental Initiatives by Type of Administering Authority

	DoE Central Office	DoE Regional Offices	Local Governments
Information	<p>EP Act and Policies. Guidelines including:</p> <ul style="list-style-type: none"> • Enforcement • Preparing EMPs • Preparing IEMS • The EP Act <p>Training</p> <ul style="list-style-type: none"> • State government • Local government 	<p>Site inspections, including:</p> <ul style="list-style-type: none"> • Assistance in identifying issues • Advice • Instructions on compliance requirements. 	<p>Guidelines:</p> <ul style="list-style-type: none"> • Operators Environmental Guidelines (predominantly developed by BCC and provided to others) <p>Site inspections</p> <ul style="list-style-type: none"> • As with DoE regions
Licence Structure and Conditions	<ul style="list-style-type: none"> • Application forms and guidelines for non-devolved activities • Licence conditions, mostly for multi-site IEMS that cross regional boundaries. 	<p>Licence conditions. These vary between regions on the basis of:</p> <ul style="list-style-type: none"> • Number and type of conditions (general or specific) • Operator involvement in setting conditions 	<ul style="list-style-type: none"> • Application forms and guidelines • Licence conditions
Enforcement	<p>No enforcement from DoE central office. Central office licences enforced by regions.</p>	<ul style="list-style-type: none"> • 162 Environment Management Programs (EMPs) since EP Act started • 39 EP Orders (EPOs) 	<ul style="list-style-type: none"> • most avoid the use of high level enforcement options • 148 EMPs • 106 EPOs
Incentives	<p>No or few fee waivers from central office. Fee waiver guideline and administrative systems developed by central office.</p>	<p>Fee waivers when requested. Rarely encouraged or advertised by regions.</p>	<p>Various systems in use.</p> <ul style="list-style-type: none"> • Many have standard fee reduction • Some have incentive licence systems • Some charge scheduled fee.

Sources: EP Act Annual Reports, Triangulation Survey

4 Study Methods

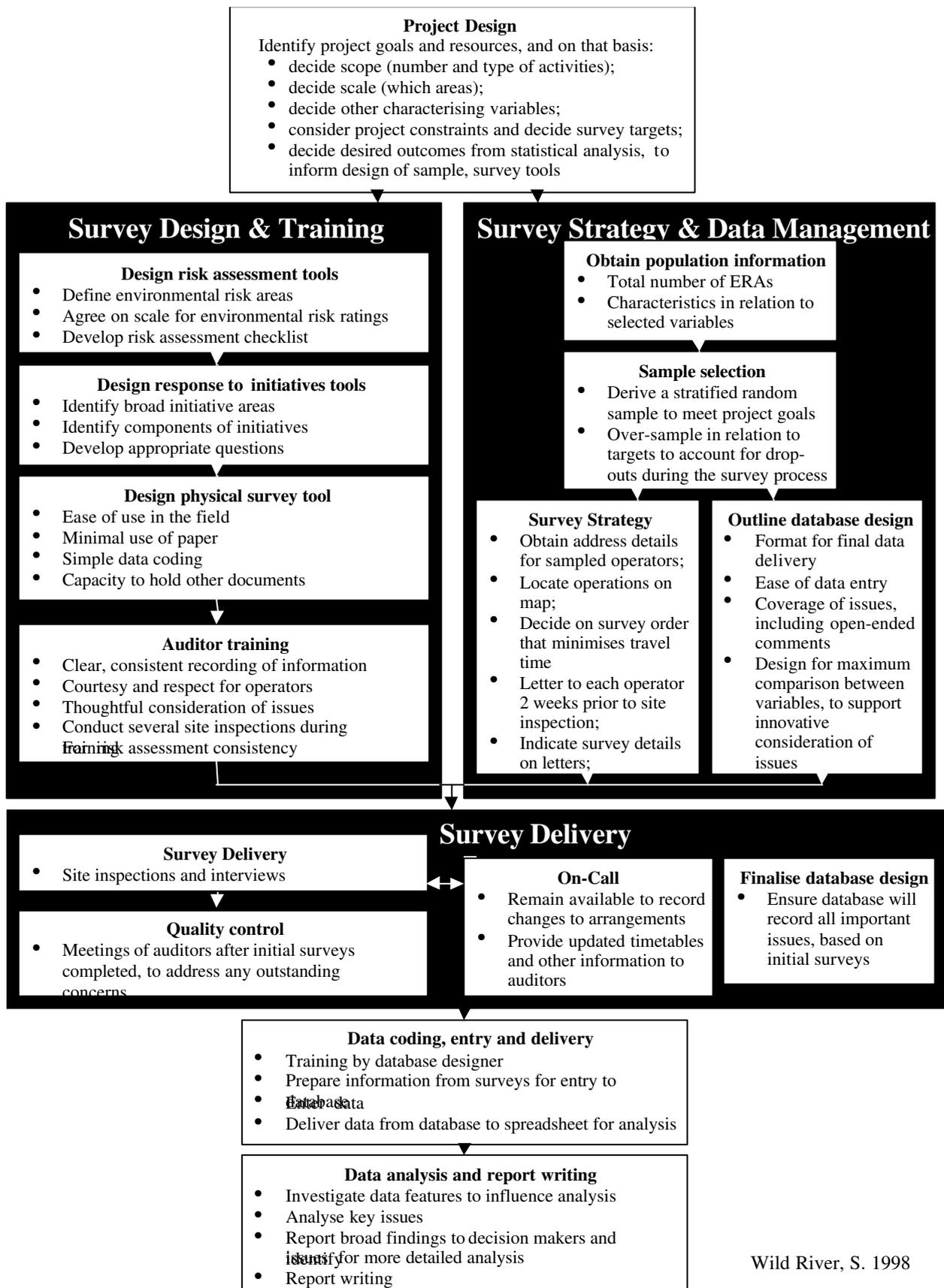
The Benchmarking Study methodology quantifies environmental risk, risk reduction and response to environmental initiatives by ERAs. The Study methodology:

- selects a representative sample of non-devolved and devolved activities from across Queensland;
- proceeds through an accompanied site inspection to assess potential, 1995 and 1998 environmental risk. This was in conjunction with
 - a survey to determine operators' views on the importance and effectiveness of a range of environmental initiatives undertaken by administering authorities; in addition
 - findings were cross-checked with administering authorities using a 'triangulation' survey, which was conducted with appropriate officers from each participating local government, and most DoE regional and district offices; and
 - statistical techniques were used to derive findings.

These elements of the study methodology are described briefly below.

A detailed discussion of Study methodology is provided in the Benchmarking Study *Scientific Report on Detailed Methods and Findings*. An overview of the project process is provided in Figure 3, which appears on the following page.

Figure 3: Benchmarking Study Process



Wild River, S. 1998

4.1 Sample Selection

The first step in selecting activities for the Study was to select appropriate ERAs from the 85 ERA types listed in the EP Regulation. This was done in consultation with DoE personnel. The final selection included at least one ERA type from each broad ERA category, to best represent the range of all ERAs.

Stratified random sampling gives the best guarantee of accurately representing the full range of characteristics of interest within a varied population. The variation within the population of ERA licence holders is evident in Tables 2.1a and b above. ERA characteristics considered in sample stratification included:

- ERA type;
- whether an activity was devolved or non-devolved;
- the DoE region within which the activity operates;
- whether the activity had been subject to enforcement action (EMP or EPO); and
- whether or not the activity held an IEMS licence.

Table 3.1a (which appears after the Benchmarking Study Process diagram) shows population and sample characteristics by ERA and region. The table also shows which characteristics of the ERA type determined that activity's selection. These were features of the activities that are not readily available on existing databases, but which were proposed for use as characterising variables during statistical analysis of findings.

Table 3.1a: ERA Population and Sample Characteristics

#	Description	Characterising Features	FN	N	CC	SW	SE	C O	Pop Sample
3	Piggery	• Administering authority (DPI)	0 1	1 0	7 0	37 3	0 0	0 0	45 4
6	Chemical manfctng, processing or mixing	• Common for category	1 1	16 2	11 1	3 2	51 3	2 2	67 11
7	Chemical storage	• ERA type	0 1	3 0	1 0	0 0	1 1	0 0	5 2
11	Petroleum product storage	• ERA type • Low risk non-dev	11 2	55 2	36 0	14 2	42 3	0 1	158 10
12	Petroleum refining or processing	• High pollution potential	0 0	0 0	0 0	0 0	1 1	0 0	1 1
14	Sewage treatment	• public ownership	52 5	75 1	74 0	62 5	106 9	9 0	378 20
15	Water treatment	• public ownership	5 1	10 1	22 0	18 2	15 2	1 0	71 6
19	Extraction of rock or other material	• ERA type	20 1	46 1	37 1	32 2	58 2	11 0	204 7
22	Abrasive blasting	• High pollution potential	9 1	47 3	28 0	19 3	57 9	0 0	160 16
23/ 25	Metal working (boiler making/metal forming)	• numerous ERA, • dropping to L2	100 1	182 5	171 0	164 9	522 60	0 0	1139 75
24	Metal surface coating	• Pollution potential	23 1	88 0	71 0	118 0	322 5	0 0	622 6
26	Metal recovery	• Industry-driven envt improvements	18 0	44 0	45 0	36 1	139 17	0 0	282 18
28	Motor vehicle workshop	• most numerous ERA	371 3	664 7	736 0	729 13	3444 83	0 0	5944 106
SP/ PB	Spray painting and panel beating	• biggest risk reduction (BCC)	21 3	70 0	66 0	73 3	504 33	0 0	734 39
32	Meat processing	• widely perceived as high risk	2 0	4 1	4 0	8 2	22 3	0 0	40 6
36	Sugar milling	• ERA type	6 1	2 0	5 2	0 0	4 1	0 0	17 4
38	Land development	• never commenced • thought high risk	0 0	0 0	1 1	0 0	0 0	0 0	1 1
41	Metal works	• IEMS • High risk	0 0	4 1	4 1	0 0	0 0	0 1	8 2
52	Tannery	• thought to have varied risk	0 0	1 0	0 0	5 0	7 2	0 0	13 2
57	Asphalt manufacture	• ERA type	1 1	2 1	0 0	1 0	2 0	3 0	9 2
60	Concrete batching	• changed SG to LG licence with EP Act	31 2	36 3	61 0	43 9	133 15	0 0	304 29
65	Sawmilling or woodchipping	• thought to have varied risk	1 0	6 1	34 4	31 2	37 4	1 1	110 12
70	Railway yard or depot	• public ownership	7 1	10 1	6 0	4 0	6 1	1 1	34 4
74	General waste disposal facility	• public ownership	29 2	39 2	50 0	54 3	33 4	7 0	212 11
76	Regulated waste disposal facility	• new, unclear requirements	17 0	12 2	12 0	19 2	23 2	1 0	84 6
78	Chemical or oil recycling	• ERA type	1 1	3 2	1 0	1 1	11 0	0 0	17 4
83	Waste transport	• ERA type	24 1	21 0	21 0	13 0	61 2	7 0	147 3
85	Regulated waste treatment	• ERA type	4 0	6 0	5 0	14 2	19 0	1 0	49 2
Population Total			754	1447	1509	1498	5620	44	10872
Sample Total			30	35	10	66	262	6	409

Notes: Other than for piggeries, table only includes ERAs licensed by DoE and local government.

ERAs 23 and 25 are combined for analysis, and panel beaters and spray painters are identified as a separate industry sector to motor vehicle workshops. This reflects observed industry features, recognised by local government administering authorities.

Rigorous sampling allows findings to be inferred back to the population from which a sample was derived. It is worth briefly noting the features of this sampling process in relation to the population inferences. The particular method of stratification that was used provides the greatest capacity for comparative analysis across groups. Findings can therefore be made between the ERA types, and between the other characterising variables that were considered in stratification. In terms of ERA types, the sample outlined above represents 53% of non-devolved and 83% of devolved ERAs.

The makeup of the sample, in terms of licence type and region is presented in Table 3.1b below. Population data is not provided for comparison, since none is available that describes ERAs in these terms.

Table 3.1b: Sample of ERAs in the Benchmarking Study by Licence Type and Region

Licence Type	FN	N	CC	SW	SE	CO	Totals
Multi-site IEMS	1	4	1	3	1	4	14
Single site IEMS	6	6	4	2	14	1	33
Non-devolved non-IEMS	6	4	5	8	12	1	36
Devolved unaffiliated	9	16	0	28	194	0	247
Devolved affiliated	2	2	0	8	26	0	38
Local Government IEMS	6	3	0	16	15	0	40
Total	30	35	10	65	262	6	408

Note: Sample size varies depending on the question being considered due to sample characteristics. See table 3.2d.

As well as the characteristics that were used in sample stratification and selection, a range of other characterising variables were assessed during site inspections, through triangulation surveys, and by scrutiny of survey response sheets. These are outlined in Table 3.1c below. Sample features in relation to the characterising variables are provided, with population details when available.

It is worth noting that population features for many important variables were difficult to obtain due to inconsistencies in the EP Act Annual Report. In particular:

- where the number of ERAs are reported, some administering authorities provide data only on the number of new ERA licences issued during the report period, while others report on the total number of ERAs administered by that administering authority; and
- other information such as levels of licence fees charged are not provided in the Annual Report.

Table 3.1c: Population and Sample Characteristics by Characterising Variables

Characterising Variable	Description	Levels	Population	Sample
Region	DoE region in which the activity is located	<ul style="list-style-type: none"> Far North (FN) North (N) Central Coast (CC) South West (SW) South East (SE) Central Office (CO) 	981 1882 1807 1664 7219 93	30 35 10 66 263 ⁴ 6
Devolved/ non-devolved	Whether the activity is devolved, or administered by state government	<ul style="list-style-type: none"> Non-devolved (No) Devolved (Yes) 	3183 10,676	125 285
IEMS	Whether the activity is an IEMS or non IEMS licence holder.	<ul style="list-style-type: none"> Single licence (No) IEMS (Yes) 	N/A	321 87
Licence Type (level of integration)	Licence type based on auditors perceptions of the major differences and similarities between activities. A composite variable separating devolved and non-devolved activities, and IEMS	<ul style="list-style-type: none"> Multi-site IEMS (1) Single site IEMS (2) Non-devolved non IEMS (3) Unaffiliated devolved (4) Affiliated devolved (5) Local Government IEMS (6) 	N/A	14 33 36 247 38 40
Public Ownership	Whether the activity is publicly or privately owned and operated	<ul style="list-style-type: none"> Privately owned (No) Publicly owned (Yes) 	N/A	361 49
Previously licensed	Whether the activity was required to be licensed under the repealed <i>Clean Air, Water or Noise Abatement Acts</i> .	<ul style="list-style-type: none"> Not licensed under old envt legislation (No) Licensed under old envt legislation (Yes) 	N/A	334 76
Experience with enforcement (EMP/EPO)	Whether the activity has had an EMP (voluntary or required), or an EPO.	<ul style="list-style-type: none"> Has not had EMP or EPO (No) Has had EMP or EPO (Yes) 	13,404 455	387 23
Fee Relief	What level of licence fee is being paid by the operator.	<ul style="list-style-type: none"> Full scheduled fee Standard reduction Incentive (green) licence 	N/A	316 52 41
Continuing Level 1	Whether the activity continues as Level 1 as a result of the <i>EP Regulation 1998</i>	<ul style="list-style-type: none"> Dropping to Level 2 under 1998 Regulation (No) Staying Level 1 (Yes) 	N/A	86 324
Approach of Administering Authority	What approach the administering authority perceives it has brought to its implementation program (from the triangulation survey)	<ul style="list-style-type: none"> High level approach (High) Moderate level (Med) Low level approach (Low) 	N/A	239 139 30
Specific Conditions	What type of licence conditions are applied by the administering authority (triangulation survey)	<ul style="list-style-type: none"> Conditions flexible (No) Conditions specific (Yes) 	N/A	379 31
Industry Association	Whether the activity is in an industry association.	<ul style="list-style-type: none"> Not in association (No) In association (Yes) 	N/A	164 246

Note: N/A = data not available

A key opportunity for this Study was its capacity to build data collected in the BCC Benchmarking Study directly into the database for analysis in this study. Different parts of the BCC data were built into different parts of the analysis in this Study as appropriate. Table 3.1d below shows the number of BCC records included in different parts of the analysis for this Study.

⁴ Includes 193 records from BCC Benchmarking Study

Table 3.1d: BCC Benchmarking Data Carried Into Statewide Study

Area of Analysis	BCC data used	Justification	# BCC Records
Risk Assessment	All for ERAs included in this Study (all from BCC study except printers).	Environmental risk issues fully comparable across Queensland	169
Response to Initiatives	Sample of BCC sample, as per sampling strategy for this Study.	Subset avoids possible bias from qualitatively different environmental initiatives between administering authorities	52
Open ended comments	All	Open ended comments general enough not to bias results	194

4.2 Risk Assessment

Risk assessment survey tools were designed for long-term relevance, generic application and simplicity of use. The risk assessment checklist was designed using;

- the Australian New Zealand Standard for Risk Management
- DoE common licence conditions
- operators Environmental Guidelines other local government licence support information; and
- the methodology from the BCC Benchmarking Study

The risk methodology used on site involved:

- identifying and rating environmental risks;
- assigning ratings for potential, 1995 and 1998 risk; and
- grouping risk ratings into environmental risk areas.

All parts of the risk assessment methodology are explained in full in the Benchmarking Study *Scientific Report on Detailed Methods and Findings*.

4.2.1 Identifying and Rating Environmental Risks

Environmental risk ratings are numeric values representing the level of environmental risk for an activity. The risk ratings and definitions used in this Study are outlined in Tables 3.2.1a, b and c below (which are also provided in the *Scientific Report on Detailed Methods and Findings*).

Table 3.2.1a: Qualitative Measures of Likelihood

Level	Descriptor	Description
A	Almost certain	The event is expected to occur in most circumstances
B	Likely	The event will probably occur in most circumstances
C	Moderate	The event should occur at some time
D	Unlikely	The event could occur at some time
E	Rare	The event may occur only in exceptional circumstances

Source: Australian/New Zealand Risk Management Standard

Table 3.2.1b: Qualitative Measures of Consequences or Impact

Level	Descriptor	Outcome Description	Example Detail Description
1	Catastrophic	Disaster with potential to lead to collapse	Toxic release off-site with long and short term environmental impacts, very costly cleanup
2	Major	Critical event, which with proper management, will be endured	Off-site release with short term and cumulative environmental impacts. Costly cleanup
3	Severe	Significant event, which can be managed under normal procedures	On-site release contained with outside assistance, environmental nuisance caused, some cleanup needed
4	Minor	Consequences can be readily absorbed but management effort is still required to minimise impact	On-site release, possibly contained, no clean-up needed, possibly some cumulative environmental impacts
5	Insignificant	Not worth worrying about	No perceivable environmental impacts

Source: Australian/New Zealand Risk Management Standard,
As adapted by Wharton, S. 1996, Program Officer, Contaminated Land, BCC

Table 3.2.1c: Risk Assessment Matrix

Likelihood	Consequences				
	1	2	3	4	5
A (almost certain)	8	16	32	64	128
B (likely)	4	8	16	32	64
C (moderate)	2	4	8	16	32
D (Unlikely)	1	2	4	8	16
E (Rare)	1	1	2	4	8

Source: Australian/New Zealand Risk Management Standard
As adapted by Wild River, S. 1997

4.2.2 Assigning Potential, 1995 and 1998 Risk Ratings

This study assigned environmental risk scores for consideration of three benchmarks. These were potential, 1995 and 1998 environmental risk. Definitions for these are:

- Potential Environmental Risk = The risk to environmental values if the activity was conducted considering only short to medium term production expediency.
- 1995 Environmental Risk = The actual risk to environmental values from the activity at the commencement of environmental licensing.
- 1998 Environmental Risk = The actual risk to environmental values from the activity at the time of the risk assessment.

4.2.3 Environmental Risk Areas

Environmental risk areas identify which environmental values are likely to be affected through release of contaminants into the environment. Nine environmental risk areas that were considered in this study are defined in Table 3.2.3 below. Wherever possible, definitions from the EP Act, Regulation or associated Policies were adopted for the definitions.

Table3.2.3: Definitions of Environmental Risk Areas

Risk Area	Definition	Examples
Surface water	Point source release of contaminants to surface waters	Discharge of secondary treated sewage into the ocean via a pipe
Groundwater	Release of contaminants to groundwater	Leakage of contaminants from underground petroleum bulk storage tanks
Stormwater	Release of contaminated stormwater off site	Spilt grease and waste oil left on uncovered (eg outside) sealed area
Fugitive Air	Non-point source release of contaminants to the atmosphere (other than odour)	Two-paint paint sprayed outside or dust from unsealed roads
Point Source Air	Release of contaminants into the atmosphere via a chimney or other stack	Emissions from a sugar mill, abattoir, or refinery chimney
Odour	Offensive smell migrating off site	Offensive smell drifting through residential area from tannery
Noise	Emission of noise	Noise from the compressors at a sewage treatment plant disturbing neighbouring resident
Site Contamination	Release of contaminants to land	Waste slag from abrasive blasting left on soil
Waste	Any gas, liquid, solid or energy (or a combination of wastes) that is surplus to, or unwanted from, any industrial, commercial, domestic or other activity, whether or not of value.	Sump oil removed from a car, and stored

4.3 Response to Initiatives

As well as assessing environmental risk and risk reduction, this Study analysed the responses of ERA operators to environmental regulation under the Queensland EP Act. This was to see:

- what impact of the EP Act on the profitability or viability of operators;
- which government initiatives had been successful; and
- which could be improved to better serve the public interest.

They were also designed to draw out other comments about environmental regulation from operators. 'Response to initiative' survey tools were designed for statewide relevance in a varied policy implementation environment.

4.3.1 Gap Analysis Method

A 'gap analysis' method was used to analyse operator response to initiatives. With this method, operators are asked a set of double-barrelled questions, about the importance and effectiveness of various environmental initiatives. They are asked to rate their responses to questions on a scale of one to five, where 'one' is low, and 'five' is high for either the importance or effectiveness of initiatives, in bringing about improved environmental performance.

Mean values for the importance of initiatives, and for the gap between their importance and effectiveness were derived from this part of the Study. The size of the 'gap' between importance and effectiveness (calculated through simple subtraction) is a measure of the degree of dissatisfaction that an operator has with an initiative.

As well as this direct comparison of means, the response data were grouped into broad initiative areas of:

- information provided to operators during site inspections, or from guidelines about environmental goals and standards;
- the simplicity and clarity of licence structure and conditions;
- enforcement; and
- incentives provided to operators.

4.4 Triangulation Survey

The triangulation survey aimed to capture data about additional issues that might influence risk, risk reduction, or response to initiatives, but which related to features of the administering authority, rather than to the individual operations surveyed. The triangulation survey was also a vehicle for assessing the impact of the EP Act on administering authorities, and for assessing authorised persons views on the Act. Three questions from the survey were included as characterising variables in the database. These addressed:

- the licence fees charged by the administering authority (and whether operators were charged the full scheduled fee, a standard reduction or an incentive licence fee);
- whether the administering authority had had a low, moderate or high approach to implementing the EP Act between 1995 and 1998; and
- whether the administering authority set specific or general licence conditions.

4.5 Open Ended Comments

The methodology described so far deals with the environmental licensing system, in ways that are defined by the EP Act itself. Further insight into the EP Act and its processes was gained through recording the open-ended comments of respondents through the site inspection and interview process. Auditors simply recorded the comments that were made, or if a significant 'gap' was recorded for a gap analysis question, auditors were also encouraged to 'probe the gap', asking "what was the problem?", or other questions designed to draw out more information.

The survey data coding process involved assigning issues and categories to the open ended comments. Each issue was written as a positive answer, with respondents recorded as 'agreeing' or 'disagreeing' with an issue they mentioned during the survey process. These issues are provided in graphs for the overall categories of answers, and are used to augment and explain the statistical results.

4.6 Statistical Analysis

Detail on the statistical techniques and analysis used in this Study are provided in the *Scientific Report on Detailed Methods and Findings*. The main statistical technique used was regression analysis, which explores relationships between characterising and response variables.

Because of the large number of characterising variables, and certain characteristics of the data, statistical modelling with regression analysis was undertaken to determine groups of characteristics

that explained risk, risk reduction and operator responses to initiatives. Two characterising variables were not included in the risk reduction models or response to initiatives analysis. These were:

- the licence type variable identifying different types of IEMS, non-IEMS and devolved activities. This compound variable incorporated the variables for 'IEMS' and 'devolved', and could not be modelled along side the others. Results for this variable are therefore reported separately.
- the 'ERA number' variable was also not included in models, but was analysed with reference to the modelling that had shed light on environmental risk issues.

Response to initiatives questions were also analysed using regression analysis with additive modelling. This considered both the importance of initiatives, and the gap between the importance and effectiveness of initiatives.

Part II: Findings

5 Overview of Findings

This section provides an overview of findings for both environmental risk reduction and response to initiatives questions.

Table 4 below summarises the statistical analysis undertaken for this project. It indicates which characterising variables were found to relate to particular levels of risk, risk reduction or responses to initiatives. It also shows the breadth of statistical analysis undertaken for this Study, and that the systematic and thorough approach to statistical analysis has shed light on a range of important (and sometimes surprising) factors underlying environmental protection issues in Queensland.

Table 4: Summary of Statistical Analysis

Characterising Variables	Total Environmental Risk				Information		Licensing		Enforcemnt		Incentives	
	Ptnl	1995	1998	Rdcn	Imp	Gap	Imp	Gap	Imp	Gap	Imp	Gap
ERA Number	✓	✓	✓	✓								
Level of Integration	✓	✓	✓	✓	✓	-	-	-	-	✓	-	-
Region	✓	✓	✓	✓	-	-	✓	✓	-	✓	-	✓
Centrality	✓	✓	✓	✓	-	-	-	-	-	-	-	-
IEMS	✓	✓	✓	✓	-	-	-	-	-	✓	-	-
Continuing Level 1	✓	✓	✓	✓	-	-	-	-	-	-	-	-
Fee Relief	✓	✓	✓	-	-	✓	-	-	-	-	-	-
Env/Efficiency Link	-	-	-	-	-	✓	-	-	-	-	✓	-
Specific Conditions	-	-	-	-	-	-	✓	-	-	-	-	-
Exp with Enf (EMP/EPO)	-	-	-	-	-	-	✓	✓	-	-	-	-
Public Ownership	-	-	-	-	-	✓	-	-	-	-	-	-
Approach of Admin Auth	-	-	-	-	-	-	✓	-	-	-	-	-
Previously Licensed	-	-	-	-	-	-	-	-	-	-	-	-
Devolved/Non-devolved	-	-	-	-	-	-	-	-	-	-	-	-
Membership of Ind Assoc	-	-	-	-	-	-	-	-	-	-	-	-

- ✓ = significant differences in risk, or responses between variable levels
- = no significant differences,
- blank = not analysed
- ‘Gap’ refers to the difference between the importance and effectiveness of initiatives on a scale of 1 to 5. It is a measure of the degree of dissatisfaction with an initiative.
- Issues covered by cells contained within a double-line were included in models.
- ‘Water’ issues were modelled in the same way, for the same issues as total environmental risks, with the same results.

It is worth briefly noting the areas for which there were no significant relationships between variables. Three characterising variables that were expected to help in explaining differences, but which did not, were:

- whether an activity was previously licensed under the repealed *Clean Air, Clean Water* and *Noise Abatement Acts*;
- whether an activity is devolved or non-devolved; and
- whether an activity is a member of an industry association.

Results of statistical analysis are provided in full in the *Scientific Report on Detailed Methods and Findings*. When these findings are referred to in the text below, a reference is made to the regression analysis graph that demonstrates the finding, even though those graphs are not provided in this document. The references are provided as footnotes, and figure numbers for regression graphs are preceded by ‘R’, indicating that they derive from regression analysis findings. The figure numbers correspond to sections of the Scientific report containing detailed interpretations of findings in each graph.

5.1 Environmental Risk and Risk Reduction

The statistics below summarise the overall findings from this study in relation to environmental risk and outcomes since 1995, as a result of the EP Act, for the ERA categories included in this study.

- 1995 risk relative to potential risk was 33%;
- 1998 risk relative to potential risk was 19%; and
- this represented a mean environmental risk reduction of 41% between 1995 and 1998.

The measure of actual risk relative to potential risk gives an estimate of the residual risk that still remains, even after environmental management systems are in place.

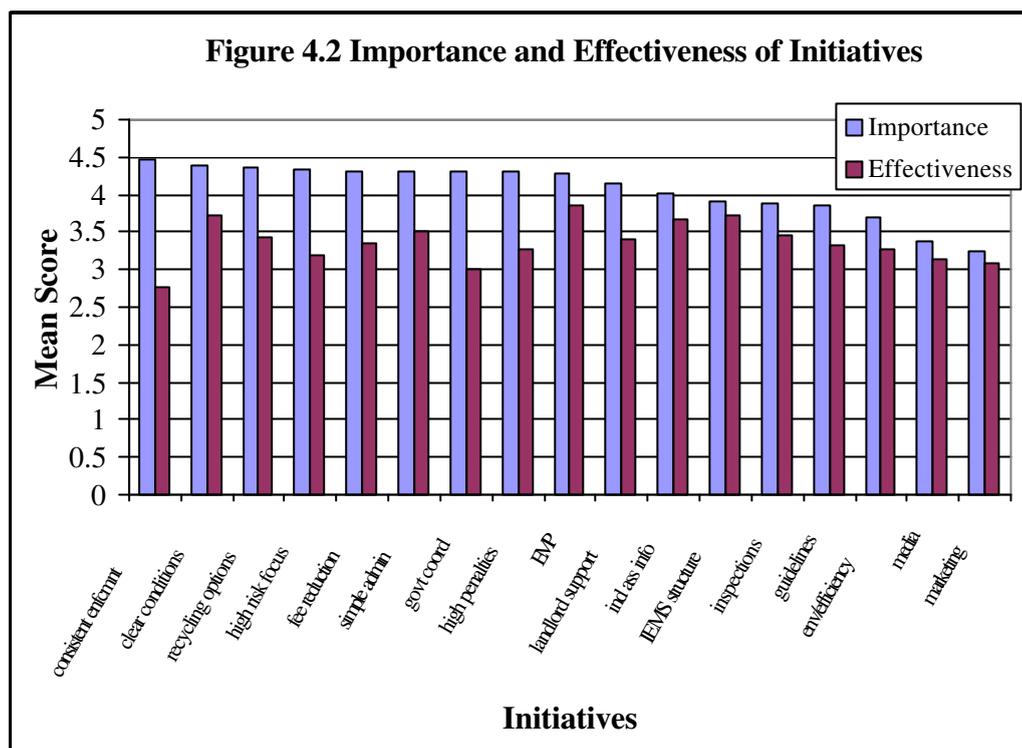
The measure of risk reduction estimates the proportional reduction in environmental risk, between two time periods.

5.2 Operator Response to Initiatives

As was stated above, this Study used gap analysis methods to evaluate operator responses to environmental protection initiatives for the EP Act. Figure 4.2 below provides an overview of operator responses to initiatives.

Several points emerge from Figure 4.2, about operator responses to initiatives overall.

- Consistent enforcement is perceived as both the most important and least effective initiative.
- Other initiatives that are considered highly important focus on:
 - practical concerns such as availability of recycling options;
 - administrative issues, such as simple forms and clear conditions; and
 - EP Act working parts, including strong support for environmental legislation with high penalties for serious environmental incidents.
- Operators considered that the most effective initiative was the EP Act's EMP provisions that offer legal protection to operators who report and address pollution problems.
- Initiatives that were considered highly important but fairly ineffective included:
 - coordination within and between government agencies, leading to consistent requirements (however responses to this question were sometimes influenced by general experience, and were not just related to environmental issues); and
 - EP Act targeting of all activities with high environmental risk, with less of a focus on low risk activities.
- Initiatives that were considered unimportant in bringing about improved environmental performance included:
 - marketing of good environmental performance; and
 - media attention to environmental issues.



Recommendations

Remove the inconsistencies in the annual report, so that the following information is reported each year:

- number of new environmental authorities issued; and
- total number of ERAs licensed by each administering authority (use a best estimate based on previous years if not provided by administering authorities);

That information reported in the annual report be expanded to also include the factors shown up in this Study to have explanatory value in understanding the impact of the EP Act. These factors would include:

- licence type (as defined in this Study);
- centrality of the area in which activities are undertaken (in Brisbane, the metropolitan fringe, provincial centres or rural areas);
- licence fees charged, or licence fee policy of administering authorities;
- administering authority policy for setting licence conditions (specific or educative); and
- approach of administering authority to implementing the EP Act (low, moderate or high level approach as defined for the purposes of this Study).

6 Cost of Environmental Protection

This study investigated three cost issues for ERA operators, associated with environmental protection. These were:

- the amount already invested in order to comply with EP Act requirements;
- amounts currently budgeted to address outstanding compliance issues; and
- EP Act licence fees.

Although there has been far more public debate about the costs associated with licence fees, compliance costs are higher for most operators than the licence fees charged.

6.1 Compliance Costs

For both the invested and budgeted cost of compliance, both the probability and amount of that investment were estimated. Both values varied considerably between licence types⁵. Table 5.1 below shows the probabilities and amounts of investments to achieve compliance.

Table 5.1: Environmental Investment and Budget Due to EP Act

Licence Type (Level of Integration)	% Investing	Sample Mean Investment (\$)		% Budgeting	Sample Mean Budget (\$)	
		Lower confidence limit	Upper confidence limit		Lower confidence limit	Upper confidence limit
Multi-site IEMS	79	23,800		43	80,900	
		6,400	88,000		11,700	560,700
Single site IEMS	88	185,200		30	243,400	
		82,800	414,200		50,100	1,182,300
Non-devolved non-IEMS	67	29,900		14	97,900	
		12,400	72,600		11,700	816,100
Non-affiliated devolved activities	39	3,400		9	5,700	
		2,200	5,300		1,300	25,600
Affiliated devolved activities	68	8,700		14	51,400	
		3,700	20,300		3,300	795,400
Local Government IEMS (per site)	57	49,600		28	216,600	
		20,100	122,400		51,900	905,000

Note: Environmental investment has not been calculated on a population basis because of complications with confidence intervals related to the sampling strategy used, which aimed to provide comparative rather than predictive data

At 88%, IEMS licences covering multiple ERAs on a site had the highest probability of investment. The amount of investment was also highest for this licence type⁶. An average of \$185,200 has already been spent on compliance costs by this licence type. High budgets for environmental improvements have also been set for many of these IEMSs with multiple ERAs on one site. An average of \$243,400 is budgeted at the 30% of the sites. This is a powerful result, since most of the activities in this licence type held environmental licences under previous legislation. The result therefore shows that the EP Act has had a significant influence on all licence holders, even those that have had a long-term involvement in environmental regulation. This suggests that the regulatory framework provided by the EP Act is more effective in driving environmental improvements, than were previous environment laws.

Probability of investment was lowest for the devolved unaffiliated activities. Only 39% of these invested to comply with EP Act requirements. The amount of investment by those operators was also lowest, averaging \$3,400.

It is important to note that calculations for investment within local government IEMS were made on a site, rather than an IEMS basis. As was stated above, local governments operate ERAs at several sites. For instance, when there are several towns within one local government area, then each of those might have a landfill, sewage and water treatment facilities, each on different sites. Council workshops and quarries also constitute individual sites for the purposes of this study. So for example, a council with 5 sites in its IEMS on average made investments for 57 per cent of those (approximately 3 sites), and that investment averaged \$49,600 per site. This would have resulted in a total environmental investment by that local government of approximately \$148,800 since 1995.

The results of interviews with local government officers during site inspections also suggested that local governments are still in a planning phase for environmental improvements to some of the ERAs they operate. This is reflected in the high environmental budgets for sites within local government IEMSs. 28% of the local government IEMS sites investigated in the Study had environmental budgets averaging \$216,600 for future environmental improvements. Two main factors appeared to underlie patterns of local government environmental investment. These were that:

⁵ Figures R5.1 and R5.2 from the *Scientific Report into Detailed Methods and Findings*.

⁶ Figure R5.3

- it appeared to take longer for local governments than for the private sector, to obtain approval for significant new environmental expenditure, meaning that funds are only now becoming available for environmental improvements in many cases; and
- local governments are aware of DoE policies to bring about significant reductions in environmental risks associated with landfills (both general and regulated waste facilities). These were the highest risk activities operated by local governments and were not licensed under previous legislation. Local governments have already taken steps to reduce environmental risk from landfills, but in many cases are either unsure about the application of broad DoE goals to their specific landfills, or perceive those goals to be impracticably high given current budget constraints.

6.2 Relationship between Cost and Risk Reduction

The relationship between environmental investments and outcomes was calculated for the industry sectors considered in this project. The relationship is most simply described as:

$$\text{Cost of environmental improvements} \propto \text{risk decrease}^{1.5}$$

This means that an increase in baseline environmental compliance costs of 1.5%, will drive a 1% environmental risk reduction. A feature of this relationship is that the actual amount of both cost, and risk decrease varies depending on where an activity is on both scales. Knowledge of this relationship has the capacity to improve government sensitivity to business cost constraints in setting future environmental protection goals.

Recommendations

- Decrease the costs of compliance within operations:
 - ➡ consider proposals by operators for reduced monitoring requirements when such requirements entail undue financial hardship relative to benefits; and
 - ➡ provide training for inspectors in least-cost options for environmental protection. These options may be based on either management or infrastructure systems (for example, consider the relative effectiveness of dirt and concrete bunding, and identify conditions under which the lower cost, dirt option is acceptable).

6.3 Licence Fees

The EP Act regulatory framework provides two main ways for administering authorities to reduce the licence fees paid by licence holders:

- Section 49 of the EP Regulation (as amended on 1 March 1996) provides a head of power for a waiver of all or part of the scheduled fee. This can be on the basis of either financial hardship, or when the risk of serious or material environmental harm is low compared to other activities of its type, or insignificant overall; and
- Section 196 of the EP Act (as amended on 23 May 1996) allows local governments to make local laws prescribing a fee lower than the scheduled fee.

In relation to local laws setting licence fees, there is evidence that the triggers for reduced licence fees are unrelated to environmental issues. Table 5.2 below outlines the patterns of licence fee reduction that were observed amongst the 17 councils surveyed.

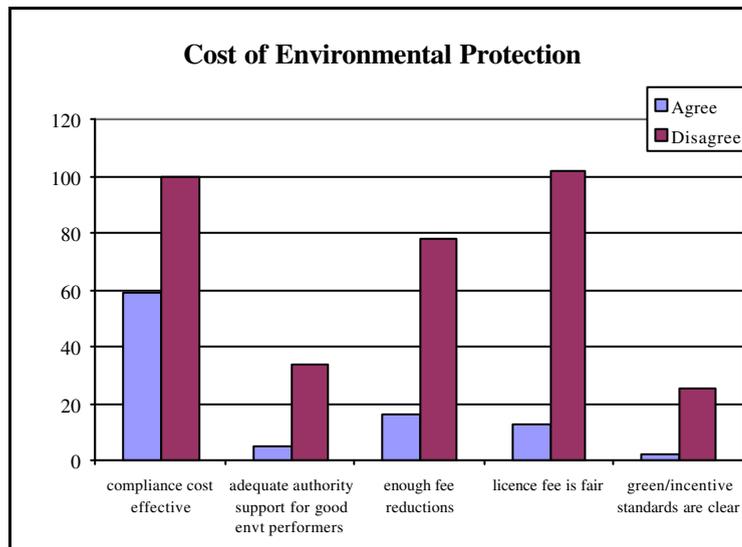
Table 5.3: Patterns of Local Government Licence Fee Reductions

	Full Scheduled Fee	Standard Reduction	Incentive Licence
Larger Councils	Often	Rarely	Sometimes
Smaller Councils	Rarely	Often	Rarely
High Level Approach	Sometimes	Rarely	Often
Moderate Level Approach	Often	Sometimes	Sometimes
Minimal Level Approach	Rarely	Often	Never
Local Economy OK⁷	Sometimes	Sometimes	Sometimes
Depressed Local Economy	Rarely	Often	Rarely

The statistical analysis sheds light on a possible problem associated with this pattern of fee reduction. Operators who are charged a licence fee with a standard reduction have a higher risk overall than those with incentive licences⁸. This could pose problems for the competitiveness (profitability and viability) of businesses in neighbouring local government areas, where one charges a standard reduction, and its neighbour charges a full fee to competitive firms.

It is worth noting that inconsistent fee relief between local governments does not appear to explain operator dissatisfaction with incentives. This is because respondents in the Far North recorded relatively low dissatisfaction with incentives, and each Local Government surveyed in the Far North had charged the standard fee⁹.

Figure 5.2 below shows operators' comments on the cost of environmental protection. The graph suggests that although compliance costs outweigh licence fees in most cases, licence fees are still the focus of most operator frustration about the cost of environmental protection. This appears to be because operators recognise tangible benefits from compliance costs, even when they perceive environmental improvements as adding a net cost to their operations. In contrast, many do not recognise value of the services they receive for their licence fees.



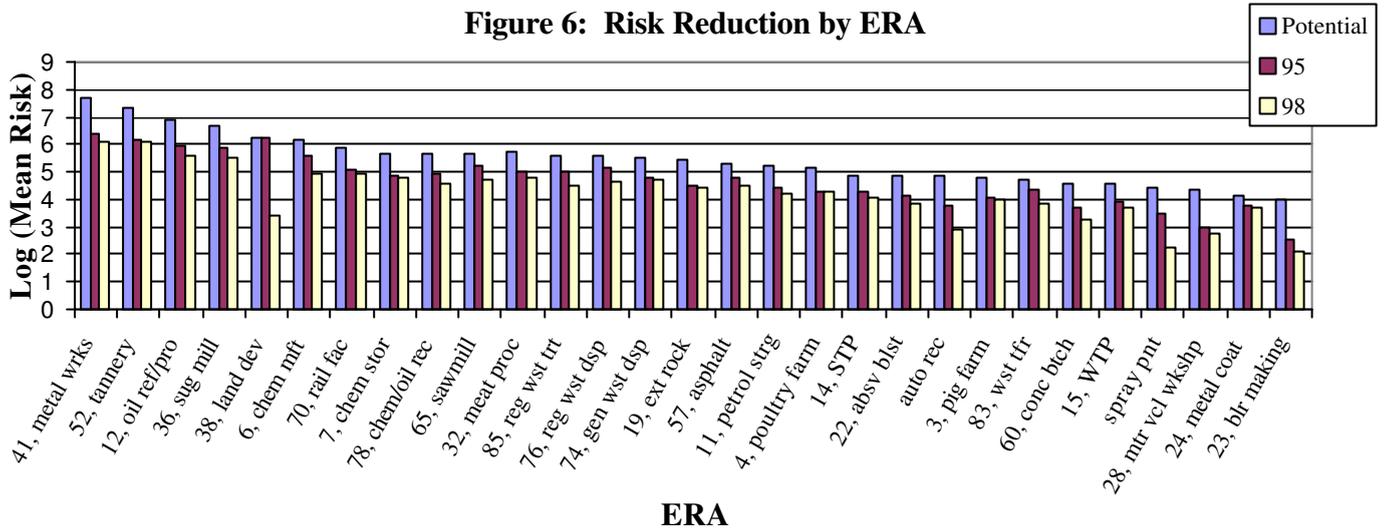
⁷ Local economic conditions estimated on the basis of comments from administering authority representatives and local business people surveyed.

⁸ Figures R4.3.1.5, R4.3.2.5 and R4.3.3.5

⁹ Figure R8.4.4

7 Environmentally Relevant Activities

Statistical analysis showed significant differences in the potential, 1995 and 1998 environmental risk of different ERAs. It also showed differences in environmental risk reduction between ERA types¹⁰. The risk levels for the three benchmark periods are shown in Figure 6 below.



Statistical analysis also provided details on risk reduction and residual risk by ERAs, and these results are summarised in Tables 6a and 6b. The tables show which ERAs have low, medium or high potential environmental risk. Table 6a also shows whether risk reduction by the ERA was low, medium or high compared to others. Table 6b provides a benchmark for the mean residual risk for each ERA type in mid 1998.

¹⁰ Figures R4.1.1, R4.1.2, R4.1.3, R4.1.4.

Table 6a: Risk Reduction by ERA Type

Risk Reduction (1998/1995)	Potential Risk		
	Low (1-128)	Medium (129-256)	High (>256)
Low (0-20%)	24, metal surf coating	4, poultry farm 11, petrol prod storage,	3, piggery 7, chemical storage 19, rock extraction 52, tannery 70, rail facility 74, general waste disp 32, meat processing,
Medium (21-40%)	15, water treatment 23, metal working/eng	12, oil refinery 14, sewage treatment 22, abrasive blasting 57, asphalt manfctr 60, concrete batching	12, oil refinery 36, sugar milling 41, metal works 76, regltd waste disp 78, chem and oil recyc
High (>40%)	27, metal recovery (automotive recycling), 28, motor vcl wkshp -spray pnt/pnl beating, 83 Waste transport		6,chem manufacture 38, land development 65, sawmill, 85, regltd waste ttmnt

Note that activities included in the 'High' category for risk reduction exceeded state average.

Table 6b: Residual Risk by ERA Type

Residual Risk (1998/potential)	Potential Risk		
	Low (1-128)	Medium (129-256)	High (>256)
Low (0-20%)	23, metal working/eng 27, metal recovery (automotive recycling), 28, motor vcl wkshop - spray pnt/pnl beating,		
Medium (21-40%)	83 Waste transport	11, pet product storage 12, oil refinery, 22, abrasive blasting 60, concrete batching	6,chem manufacture, 19, rock extraction 32, meat processing, 36, sugar milling 41, metal works 52, tannery 65, sawmill 70, rail facility 85, regltd waste ttmnt
High (>41%)	15, water treatment 24, metal surf coating	4, poultry farm 14, sewage treatment 57, asphalt manfctr	3, piggery 7, chemical storage 38, land development 74, general waste disp 76, regltd waste disp 78, chem and oil recyc

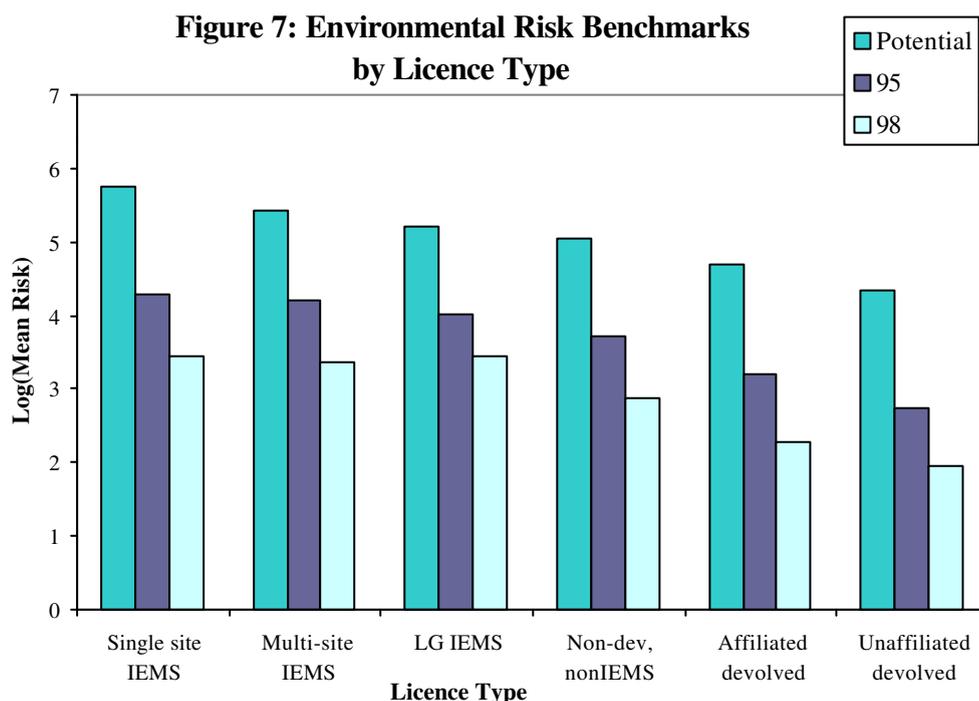
Note that activities included in the 'Low' category for residual risk have fewer unmanaged risks than the state average.

Recommendations

- Develop a 'Goals' 2008 Environmental Protection Policy. This would:
 - establish a 10 year time frame for environmental protection, aiming to provide realistic time frames, and clear priorities to operators;
 - further formalise DoEs role as lead agency for the environment, and link to corporate planning issues;
 - identify activities with high residual environmental risk, that will have furthest to progress to meet goals. Target government resources to provide particular assistance, advice and flexibility to those operations; and
 - provide a mechanism for regular reporting on progress towards goals.

8 Licence Types

Statistical analysis showed significant differences in the potential, 1995 and 1998 environmental risk of different licence types. As with ERA type, analysis also showed differences in environmental risk reduction between licence types¹¹. The risk levels for the three benchmark periods are shown in Figure 7 below.



Statistical analysis also provided estimates of the potential risk level, 1995-98 risk reduction and residual risk in 1998 by licence type. These are provided in Table 7 below.

¹¹ Figures R4.2.1, R4.2.2, R4.2.3, R4.2.4.

Table 7: Potential Risk, Risk Reduction and Residual Risk by Licence Type

Licence Type	Potential Risk Level	1995-98 Risk Reduction	1998 Residual Risk
Single Site IEMS	High	28%	35%
Multi-site IEMS	High	34%	33%
Local Government IEMS	Medium	19%	43%
Non-devolved, non-IEMS	High	32%	35%
Affiliated devolved	Low	52%	16%
Unaffiliated devolved	Low	45%	14%

Key points to note from Table 7 include:

- that the highest risk activities include all non-devolved activities, other than the sites within local government IEMS;
- these highest risk activities have made medium level environmental risk reductions, and this has resulted in medium levels of residual risk, proportional to potential risk;
- that sites within local government IEMS average a medium level risk. Local governments made low level risk reductions, which have resulted in medium levels of residual risk;
- that devolved activities are low risk compared to others, have made the greatest proportional risk reductions, and that these have resulted in low average residual risk.

It is worth briefly considering possible future environmental protection goals for different licence types. Environmental protection goals could be developed along the lines of risk reduction or residual risk targets. Such targets could justifiably differ between licence types.

In the case of residual risk for instance, it is reasonable and practical to expect many devolved activities to operate at an environmental risk level of close to zero. Many individual operations that are still classified as Level 1 devolved ERAs already achieve a zero risk rating under the methodology used in this study. Such operations are usually in industrial estates, or other areas away from sensitive environmental values, store and use few potential contaminants, and have these well managed in bunded storage areas. A practical industry-wide goal for many of the devolved activities would probably be a residual risk of between 5% and 10% of potential risk. This would mostly be achieved through environmental protection measures taken by operators who have not yet taken action to comply with the EP Act, and who might in some cases currently enjoy market advantages compared to their complying competitors, due to lower operating costs.

In contrast, it would be impractical for many of the larger, higher risk activities to achieve residual risk goals of less than 10%. This is because the nature and scale of potential contaminants means that even the best managed sites still entail significant potential risks. In these cases, risk targets may best be set broadly at the state or regional level, and detailed on a site-by site basis.

Recommendations

Address weaknesses of integrated licensing by:

- targeting information to meet corporate environmental management information needs, recognising that many IEMS operators employ environment professionals, capable of dealing with complex technical detail; and
- recognising IEMS as both a vehicle for environmental licensing and a management tool. Consider shifting away from blanket conditions that restrict innovation, to management conditions that support flexibility;

Enhance strengths of integrated licensing. For example:

- Support training systems brought in by IEMS operators to ensure organisational level compliance;
- Recognise organisational level improvements, including better management systems for identifying, reporting and addressing environmental compliance problems; and
- Recognise practical outcomes achieved by IEMS licensees, the high cost of these improvements, and the need for government priorities for environmental protection to be clearly defined.

Recognise the low potential risk, high risk reductions and resulting low residual risk now common for small ERA operators in most sectors. For example:

- Target enforcement at those non-complying operators who could undercut complying competitors, and sectors with disproportionately high residual risk; and
- Target incentives at those complying operators most at risk of competitive disadvantage due to non-complying competitors.

Consider non-IEMS, non-devolved licences as possible future devolved or delegated ERAs, since they have had similar responses to the EP Act (in terms of environmental risk levels and responses to environmental initiatives).

If further devolution or delegation occurs, licence fees listed in the EP Regulation should not be automatically reduced during this process.

- Recognise the different information needs of different types of small operations (as well as differences in information needs between small and large operations).
Target unaffiliated devolved activities with specific, clear, practical information.

9 Regional Issues

Statistical analysis showed significant differences in the potential, 1995 and 1998 environmental risk within different regions. Analysis also showed differences in environmental risk reduction between regions¹². The risk levels for the three benchmark periods are shown in Figure 8a below. A notable feature of the graph is that the environmental risk reduction in South West Region appears to have been minimal. Figure 8b is the regression analysis graph for risk reduction between 1995 and 1998. Findings shown in this graph appear to contradict those presented in Figure 8a, since South West Region has recorded a risk reduction since EP Act commenced, whereas there is little evidence of risk reductions in the Far North and Northern Regions.

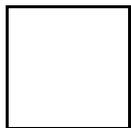
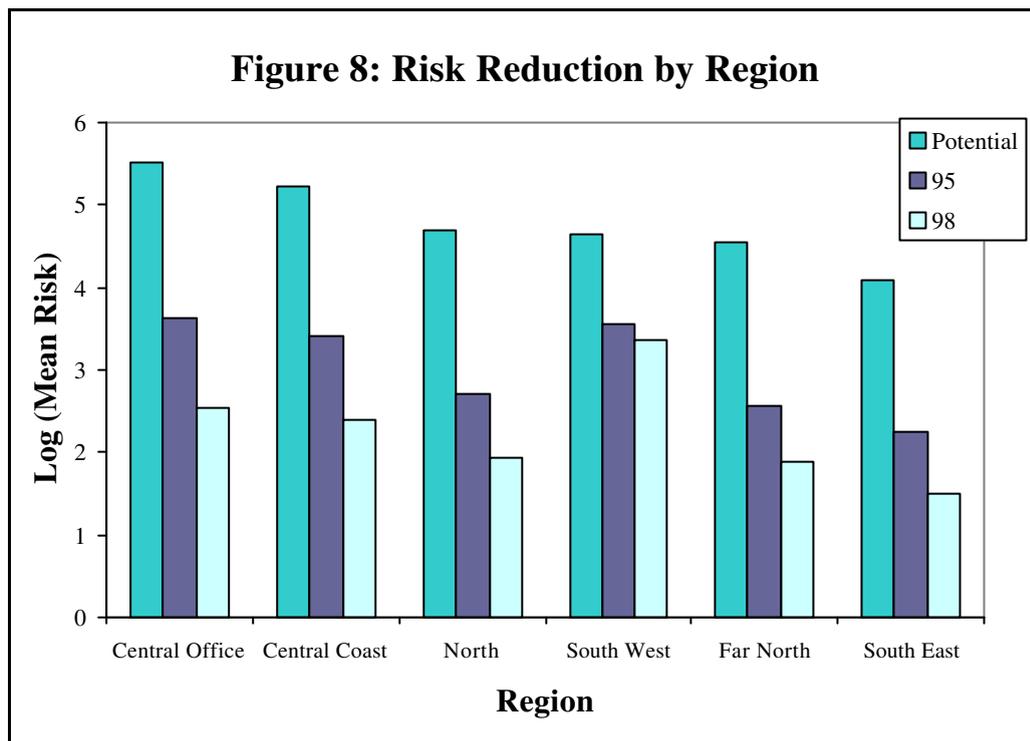


Figure 8b: Total Environmental Risk Reduction Model – Region (Regression)

9.1 Comparing Regions

The apparent contradiction between Figures 8a and b are due to methodological issues that are detailed in Section 3.3.4 of the Benchmarking Study *Scientific Report into Detailed Methods and Findings*. Careful consideration of these issues shows that the apparent contradiction, in fact sheds light on key differences in implementation strategies and outcomes between regions. The methodology used in regression analysis of risk reduction has the potential to exaggerate the impact of a few large scale risk reductions, and contract the measure of small environmental risk reductions. What this suggests, is that the South Western Region approach targeted, and brought about risk reductions, in areas of the highest risk, and lowest compliance. More minor risk issues

¹² Figures R4.3.1.1, R4.3.2.1, R4.3.3.1, R4.3.4.1

have not been as systematically addressed in the South West as in some other regions. Other issues specific to particular regions are discussed further below.

Statistical analysis also provided estimates of the potential risk level, 1995-98 risk reduction and residual risk in 1998 by region. These estimates are provided in Table 8.1 below.

Table 8.1: Potential Risk, Risk Reduction and Residual Risk by Region

Region	Potential Risk Level	1995-98 Risk Reduction	1998 Residual Risk
Central Office	High	44%	25%
Central Coast Region (Gladstone District)	High	45%	26%
Northern Region	High	25%	35%
South West Region	Medium	29%	38%
Far North Region	Medium	15%	49%
South East Region	Medium/Low	48%	13%

It is worthwhile touching briefly on some features of regional implementation strategies, that have brought about different risk reductions, and responses to initiatives at the regional level. A good comparison is provided by the South East and South West Regions.

South West Region is geographically the largest of the five DoE Regions, and has a low population density, and great distances between its many small to medium urban centres,

minimising direct competition between firms. Much of the South West had been experiencing depressed economic conditions for many years, due to factors such as a serious extended drought. EP Act implementation had an uphill battle in the South West, with media attention, and various other public information sources focusing on perceived negative aspects of new environmental protection laws. Despite this, there is a strong sense in the South West that ERA operators have a great personal concern for environmental protection. Many argue that in their small, dispersed communities, they are more closely linked to, and knowledgeable about local environmental conditions than operators in larger population centres.

In recognition of these regional conditions, local and state government administering authorities adopted 'low' to 'medium' level approaches to administering the EP Act. For example, IEMS licensing in South West Region has been a gradual process, and allowances have been made to give extra time for operators to develop IEMSs, compared to the processes in other regions. Most local governments in the South West Region charge far less than the annual licence fee in the EP Regulation, with some administering authorities charging no fee at all, or a nominal fee. In the small communities that characterise the South West Region, authorised persons tend to have good knowledge of local businesses, and have tended to favour direct contact on site over written information about compliance requirements and licence conditions.

In contrast, the South East Region is geographically small, but has by far the highest proportion of Queensland's population, as well as the highest population density of all regions. Direct competition between most types of activities is a feature in South East Queensland. South East Queensland has been among the fastest growing regions in Australia in terms of population for some time, and has had relatively favourable economic conditions compared with the South West. Although there has been With hundreds of ERAs to licence authorised persons in the South East rarely have personal knowledge of all local ERA operators. There has been a focus on communication between operators and authorised persons through written guidelines.

Many administering authorities in South East Region took a 'high' level approach to implementing the EP Act. Tough standards were set, and administering authorities place a high emphasis on consistency of these standards across local boundaries. Written

The outcomes from the different approaches shed some light on broad issues for implementing tough new regulatory requirements, as well as the EP Act in particular. Both approaches were successful in bringing about environmental improvements. The 29% environmental risk reduction in the South West though, was low compared to the 48% decrease in the South East. The different approaches have also brought about different operator responses to initiatives. Dissatisfaction with licence structure and conditions, enforcement and incentives was lower in the South West than in the South East.

Taken together, the results suggest that obtaining support for tough new regulatory requirements requires the careful balancing of:

- regulatory goals;
- the regulatory framework;
- local and regional economic conditions; and
- the pace of reform.

The absence of critical components of the regulatory system, such as low-level enforcement options, a range of practical incentives, and clearly defined compliance conditions seems to have resulted in dissatisfaction with environmental requirements in the South East Region, where the pace of reform was strongest. The problems have not been so apparent in the South West Region, where the pace of reform was kept more in line with the development of new regulatory systems¹³.

¹³ FigureR8.2.3.1, RR8.2.4.1, R8.3.3, R8.3.4.1, R8.4.4

Recommendations

- Develop components of Environmental Protection Policies to address regional issues. These would each:
 - define goals for regional environmental protection (possibly in terms of environmental risk);
 - identify industry sectors with significant compliance problems in each region, and formalise goals and strategies to address these problems;
 - identify economically depressed areas or sectors that may need special assistance to achieve compliance;
 - contain strategies for meeting statewide goals, so that pollution havens do not develop at the regional level;
 - identify regional priorities for enforcement, incentives, information and for simplicity and clarity of licence structure and conditions;
 - formalise the regional partnership between state and local government for the implementation of the EP Act; and
 - be developed at the regional level, requiring additional staff in each region.

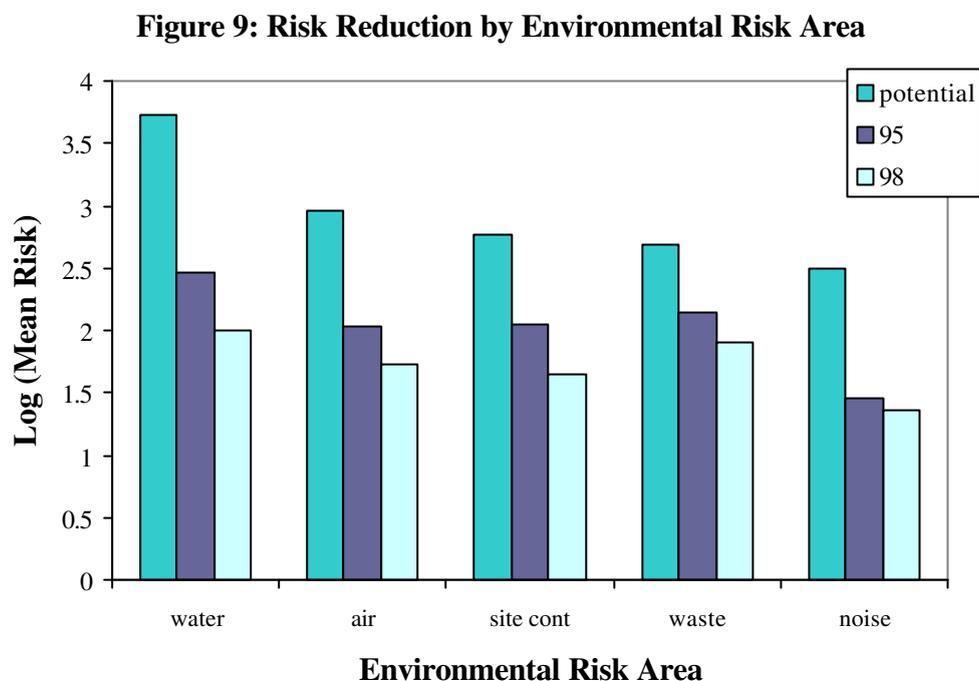
Reconsider the goal of regional consistency. This should be defined as consistency in outcomes, not consistency in how these are achieved. This would require clearer strategic statewide goal definition.

- Develop simple, technical information on key compliance issues, giving options to assist operators to achieve compliance in different environmental and operational circumstances. This could be done through environmental risk assessment as in this Study.
- Facilitate or support more policy development at a regional level for the translation of the statewide goals into information sheets, or other regional documents. This would require additional regional resources, possibly relocated from Central Office.

Involve local government and industry directly in the development of appropriate site-based options to meet statewide goals at a regional level.

10 Environmental Risk Areas

Figure 9 below shows risk reduction by environmental risk area. The graph shows that environmental improvements were made in each environmental risk area, although improvements were limited for noise.

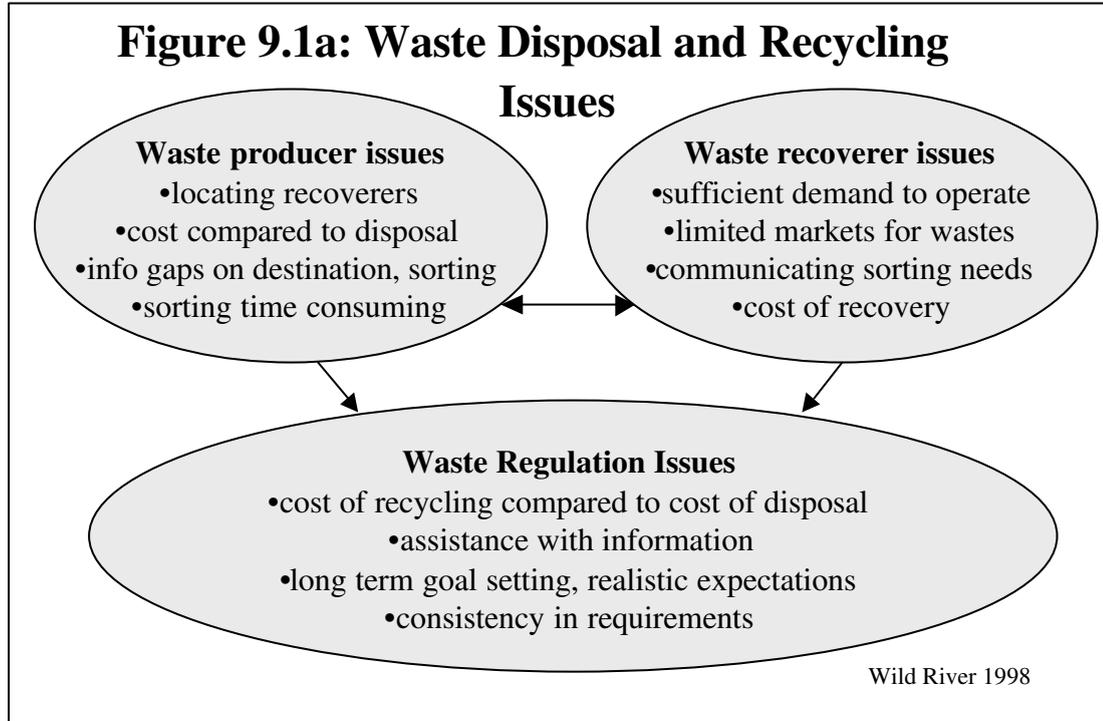


Statistical analysis of risk reduction by environmental risk area was constrained by certain characteristics of the data. Overall, the patterns of environmental improvements within environmental risk areas mirrored those of total environmental risk.

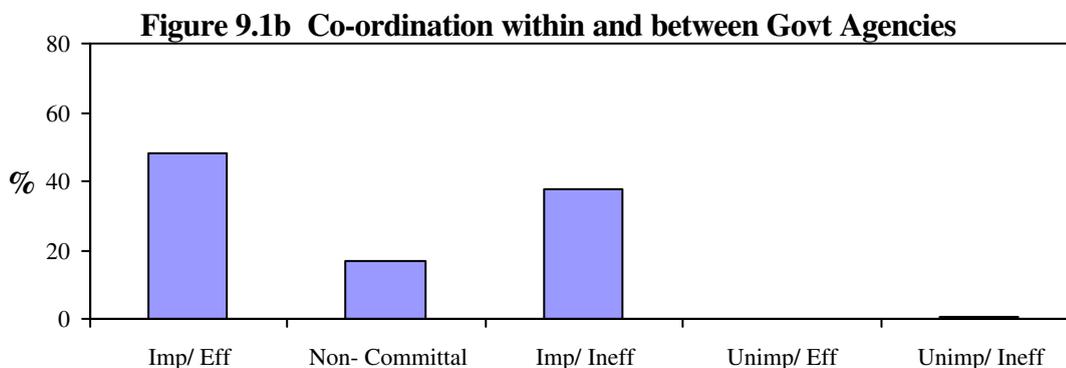
It is worth noting some practical considerations underlying risk reductions by environmental risk area. Potential risks for most risk areas can be reduced through management on a site basis. For instance, concrete sealing work areas can reduce site contamination, and bunding and working under cover can reduce the risk of both site contamination and stormwater pollution. Reducing waste poses different problems for operators. Waste disposal and recycling options are usually external to businesses themselves, relying on the presence of a waste recovery industry sector.

10.1 Waste Recovery and Recycling

Features of the relationship between ERA operators and the waste industry sector influence the success of recycling initiatives. Some key features of this relationship are shown in Figure 9b.1a below.



There is evidence from this Study that recycling has increased significantly since the EP Act commenced (for example, see Figure 9 above). However the ongoing success of recycling programs is not guaranteed. For example, operators from the waste recovery and recycling industry sector reported that they would face difficulties keeping costs low for recycling, due to a range of new government charges, many of which are unrelated to environmental issues. These have the potential to add to operating costs of the recycling industry, and will therefore result in raised costs of recycling. These sorts of apparently conflicting government requirements led to responses such as those shown in Figure 9.1b below, that shows that many ERA operators consider coordination within government to be important, but ineffective.



Many operators interviewed for this Study who had only started recycling wastes since the EP Act commenced had changed their recycling behaviour because of the availability of low or no-cost recycling. Recycling appears more likely to be undertaken when its cost is less than, or equal to other waste options.

Recommendations

Recognise the need to support the waste recovery industry. For example:

- consider options for industry sponsorship within the recycling industry. These would aim to keep the cost of the best environmental management option lower than or equal to that of alternatives that are inconsistent with waste minimisation;
- consider industry sponsorship to encourage the use of environmental best practice in waste management;
- recognise that where recycling options are zero cost, those options are used almost universally. Consider government opportunities to provide or support zero cost recycling systems.

11 Information

Statistical analysis of operator responses to information on environmental management requirements provided by administering authorities focused on:

- Guidelines, codes of practice and other written information provided to operators to explain EP Act requirements; and
- Feedback provided by inspectors during site visits.

Results of analysis showed significant differences in the importance of this information between different licence types. The information was considered most important by affiliated devolved activity operators. It was considered least important by unaffiliated devolved activity operators¹⁴.

There was some evidence that the local government operators considered information provided to them to be more important than did any other group of non-devolved activity operators.

Dissatisfaction with information also varied between operators. Modelling of this dissatisfaction showed that:

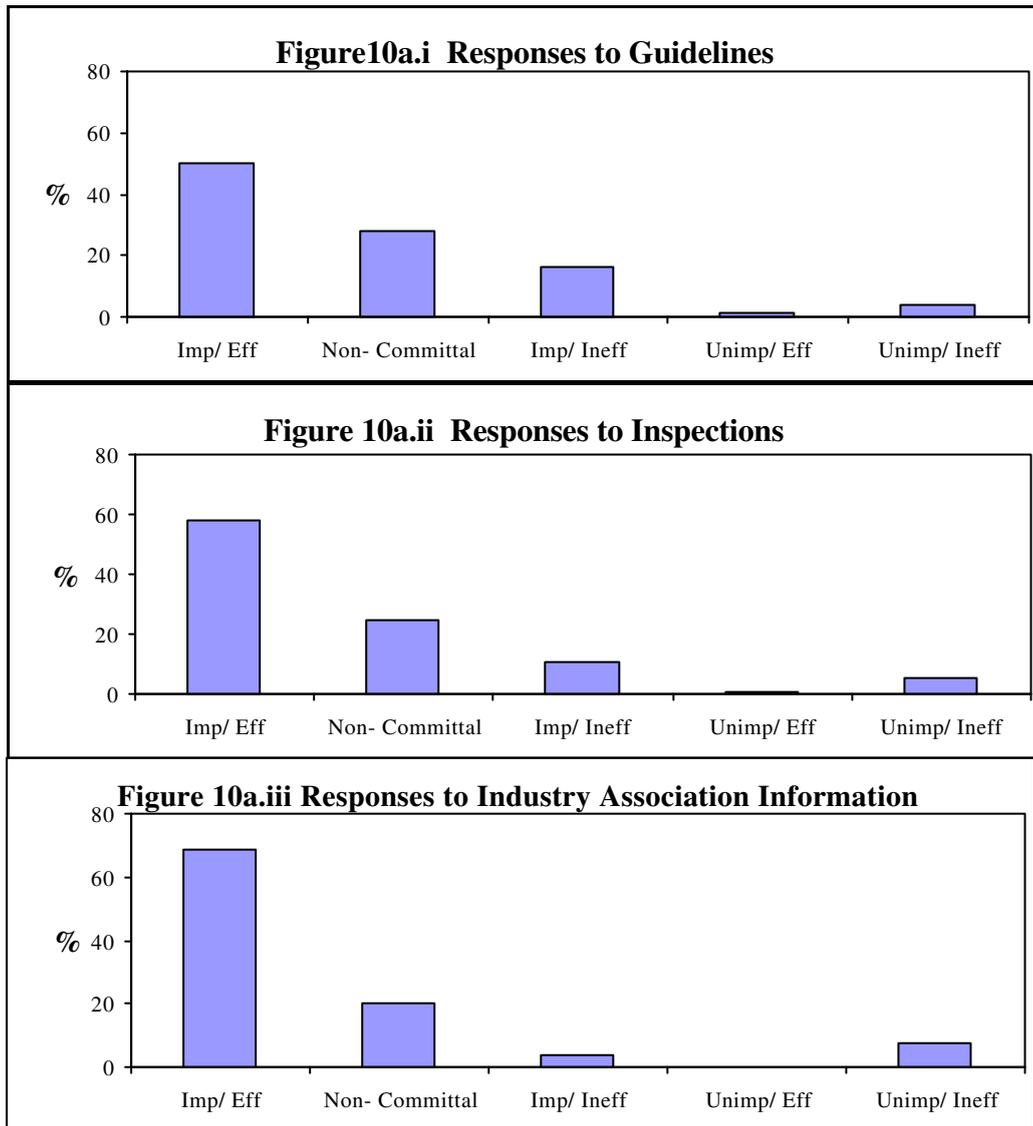
- operators that perceived a link between environmental improvements and efficiency were more satisfied with the information than those who perceive environmental improvements as being a net cost;
- operators paying full licence fees were dissatisfied overall with information. There was no evidence that operators paying a standard reduced fee, or those with incentive licences were dissatisfied with information; and
- dissatisfaction with information was higher for publicly owned operations than privately owned operations.

The graphs in Figures 10a (i-iii) below show the differences in responses to three types of information provided to operators. These were:

- for all of the types of information considered, more operators considered these to be both important and effective than any other response;
- a non-committed response was the second most common response for all three types of information; and

¹⁴ Figures R8.1.3, R8.1.4.1, R8.1.4.2.

- written guidelines and codes of practice were most often considered to be important but ineffective.



In addition to asking about the importance and effectiveness of particular environmental information sources, operators were asked whether they received environmental information from any other source. Figure 10b below shows the most common sources of other information. By far the majority of operators did not receive information from sources other than those related to the EP Act. The most common other source of environmental information was internal to the operation, or industry sector. This information tended to be from industry journals, or site inspections undertaken by operators. Second most common was information from public authorities other than the EP Act administering authority. Consultants and other professional industry sources were next most common.

Figure 10b: Information Sources for Environmental Issues

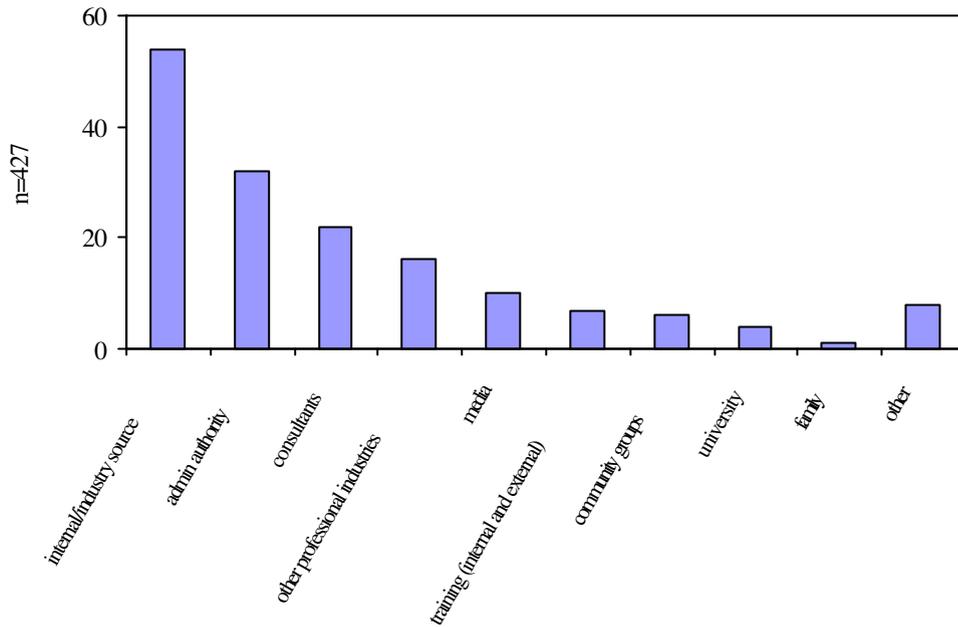
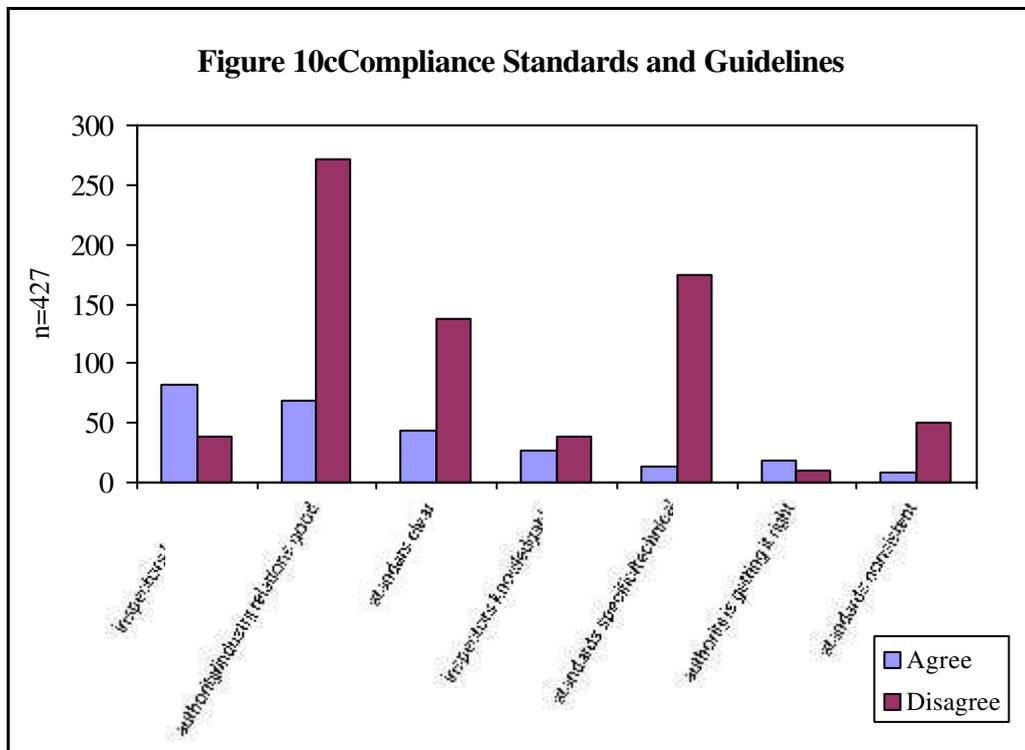


Figure 10c below shows a range of comments made about information, received through inspections and written guidelines and standards. The graph shows that operators views about these issues differed markedly, with some operators satisfied with the information, and others dissatisfied.



Recommendations

- Clarify technical detail and prioritise compliance issues in standards, guidelines and codes of practice.
- Target information better to different licence types (level of integration), and to groups that are most dissatisfied with the information that is currently provided. Undertake regular (eg annual) surveys of operators to assess responses to initiatives, for continual improvement to the effectiveness of the regulatory system.
- Ensure inspectors are adequately trained and experienced with issues related to particular industry sectors. Provide a system of mentoring new authorised persons, including more ongoing technical training for authorised persons.
- Increase consistency of standards, particularly within local or regional areas, so that operators in competition with one another have consistent requirements.

Consider using government skills and experience from outside the existing environmental protection networks where available and appropriate. For example, this could include inter-agency partnerships, such as DoE liaison with local government trade waste officers to find better solutions to trade waste issues. It might also include greater use of DoE officers by local governments for technical advice on issues less commonly encountered by local governments.

Develop a report on EP Act outcomes, pitched at ERA operators and the general public. An outline of such a report is provided as an attachment to this Report.

12 Licence Structure and Conditions

Statistical analysis of licence structure and conditions focused on the importance and effectiveness of:

- licence application and renewal forms that are simple, easy to use and valuable to operators; and
- environmental licence conditions that are clear, achievable and enforceable.

The results of analysis showed significant differences between groups of operators in relation to both the perceived importance of, and dissatisfaction with clear and simple licensing. Differences relating to both importance of, and dissatisfaction with information were based on:

- regional differences; and
- experience with EMPs or EPOs.

Differences relating only to the importance of information were based on:

- different administering authority approaches to EP Act implementation;
- whether administering authorities applied specific or general conditions to licences¹⁵.

There was evidence that both the importance of, and dissatisfaction with information was higher in South East than in any other region. Possible reasons for this include:

- that EP Act implementation by local governments started first in South East Region, and local governments in other regions were able to apply lessons learnt in that region to develop simpler, clearer systems;
- that the licence conditions applied to IEMS licences by DoE South East Region are detailed and prescriptive for each ERA, rather than the risks to be addressed IEMS as a whole. This appears to be perceived as adding complexity to the system.

Both the importance of, and dissatisfaction with licence simplicity and clarity was lower in the Northern and Central Coast Regions than in other regions. There was no evidence of dissatisfaction with licence simplicity and clarity by Central Coast or Central Office licence holders.

¹⁵ Figures R8.2.3.1, R8.2.3.2, R8.2.3.3, R8.2.3.4, R8.2.4.1, R8.2.4.2.

Operators with experience with EMPs or EPOs considered licence clarity and simplicity to be more important than did operators without such experiences. Operators with this experience with enforcement were also most dissatisfied with the clarity and simplicity of the licensing system. This suggests that some of the perceived complexity of the system is related to EMP and EPO provisions in particular.

Operators whose administering authorities had a high level approach to implementing the EP Act placed a lower level of importance on the clarity and simplicity of the system than did others. A lower level of importance was also found amongst operators whose administering authorities placed specific conditions on them.

Figures 11a.i, ii and iii below show the ratings that operators gave to the importance and effectiveness of different environmental management information sources.

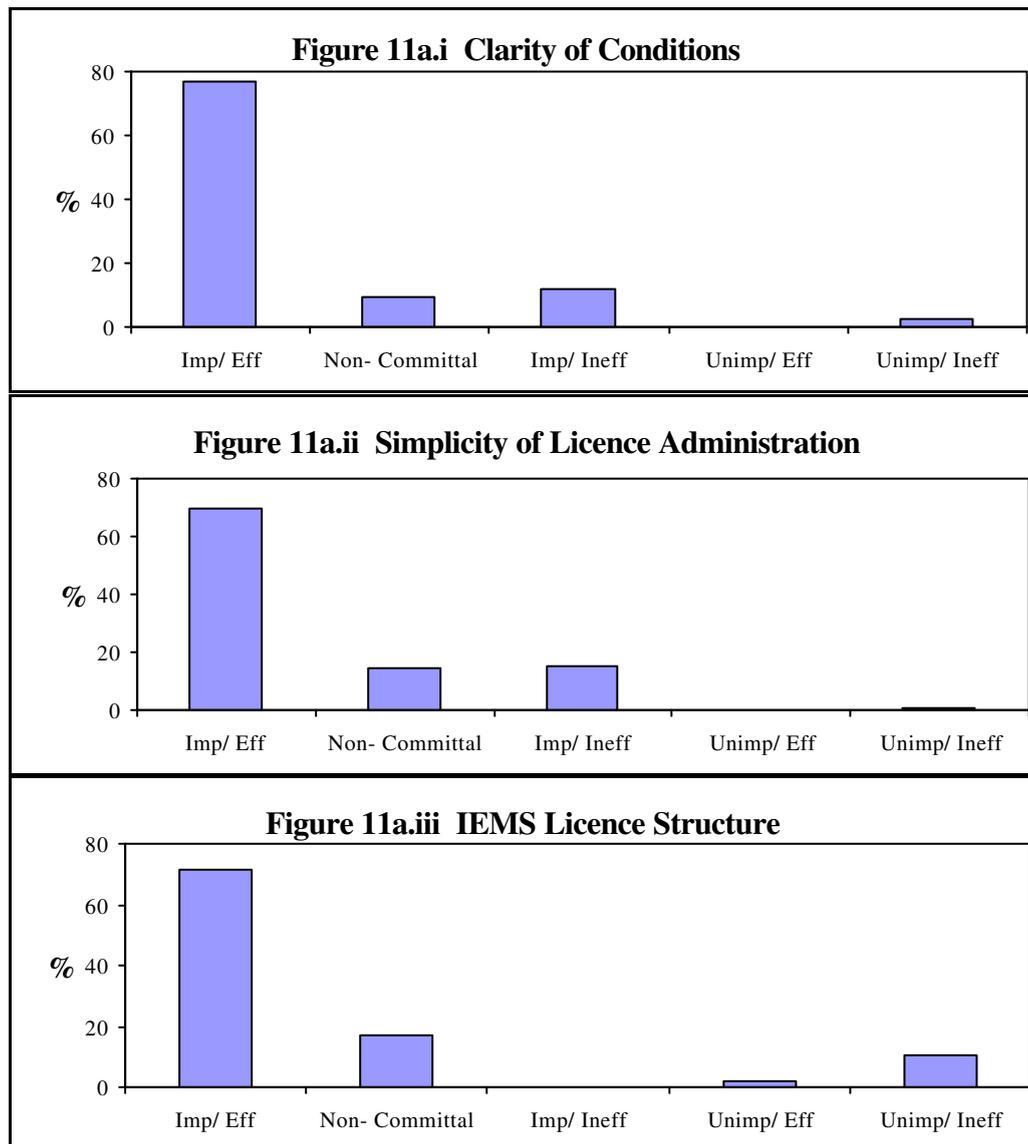


Figure 11b below shows a range of comments made about the simplicity and clarity of forms, conditions and requirements. The graph indicates which aspects of licensing are more often positively or negatively perceived. Areas in which operators were generally positive about licence structure and conditions included:

- IEMS as a way of simplifying licensing;
- IEMS as a way of effectively managing environmental risk; and

- IEMS as a method of licence fee reduction.

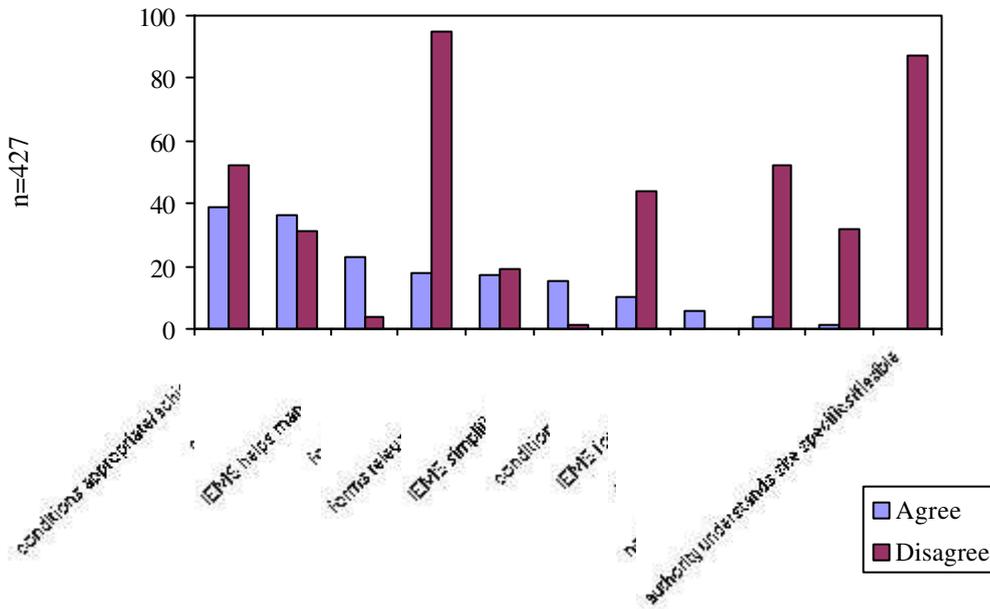
Areas in which operators more often made negative comments included:

- clarity and simplicity of forms;
- specific or technical detail in forms;
- consistency of licence conditions; and
- appropriateness and achievability of licence conditions.

Views were relatively balanced for:

- Relevance and appropriateness of forms; and
- Clarity of conditions.

Figure 11b: Forms, Conditions and Requirements



Recommendations

Recognise that the natural distinction in environmental risk levels and response to initiatives among ERA operators is between IEMS and non-IEMS, and not only between devolved and non-devolved activities. Target initiatives to consider this distinction.

Take steps to increase the simplicity and clarity of the licence system, which:

- make use of environmental risk assessment, including the methodology used in this report for percentage risk reduction, and residual risk, to clarify environmental licensing goals;
- use Central Coast, Central Office and Northern Region licences as models of clear and simple licences, and compare these to licences and conditions issued in the South East Region;
- further investigate and address the clarity and simplicity of the EMP system. Consider developing alternative EMP provisions for low-risk compliance issues. In these cases, build more flexibility into the system (including the capacity for EMP amendment at the local or regional level), and develop administrative systems to make it more accessible as an enforcement tool to be used by local governments, especially for small-scale (non-IEMS) operations; and
- consider policies and procedures to apply specific, rather than general, educative conditions onto operators. This could be particularly beneficial when administering authorities have had a low level approach to EP Act implementation.

13 Enforcement

Statistical analysis of responses to enforcement focused on the importance and effectiveness of:

- consistent enforcement across all industry sectors;
- the existence of an environmental protection Act, with high penalties, including possible imprisonment for committing serious environmental offences; and
- legal protection for operators who report pollution incidents (by way of the EP Act Environmental Management Program provisions).

The results of analysis showed significant differences between groups of operators in their levels of dissatisfaction with enforcement. Dissatisfaction with enforcement was different between operators:

- with different licence types (level of integration);
- between operators in different regions; and
- between IEMS and non-IEMS licence holders¹⁶.

With regard to licence type, operators of unaffiliated devolved activities were least happy with EP Act enforcement. Various characteristics of that licence type might contribute to the observed differences. It is by far the most numerous licence type, and even in local governments areas with very few ERAs, there are often several unaffiliated devolved activities within the same industry sector. This means that of all the licence types, this is the group with the greatest immediate competition between firms. This is also the group that apparently has the lowest discretionary budget that might be spent on environmental improvements or other investments. So although the smallest proportion of this sector invested to comply with the EP Act (39%), and although that investment was lowest (averaging \$3,400), the impact of this investment on those firms would likely have been substantial in many cases. This means that any cases of inconsistent compliance would adversely impact on complying firms, affecting their market share.

¹⁶ Figures R8.3.2, R8.3.3, R8.3.4.1, R8.3.4.2.

These licence type characteristics would also mean that any failure on the part of administering authorities to enforce consistent compliance could negatively impact on the viability or profitability of complying firms. This problem appears to have emerged in practice, because of an absence of low-level enforcement options, considered appropriate for tackling non-compliance among these firms.

Table 12a below shows the breakdown of enforcement options used by the administering authorities interviewed for this Study. It shows that local governments appeared as willing as the state government to use EMP and EPO enforcement provisions. However, comments made during interviews suggest that although the flexibility of these enforcement options make them attractive, local governments are left without appropriate mechanisms to deal with failure of operators to comply with the enforcement requirements. This is because the penalties for non-compliance with requirements under EMPs and EPOs are very high, even for minor incidents.

Table 12a: Enforcement Options Used by Administering Authorities

Option	State Government		Local Government	
	Enforcement	None	Enforcement	None
EMP	5	2	11	3
EPO	4	3	10	4
Investigation	3	4	5	9
On-the-Spot fines	3	4	3	11*
Educative/consultative role	2	5	2	-

*On-the-spot fines not being used because not available. Currently under trial by only the 3 local governments identified as using them.

Table 12b below shows the results of enforcement actions completed to date under the EP Act.

Table 12b: Summary of EP Act Prosecutions to June 1998

Offence	Nature of Offence	AA	Region	C	D	Fine (\$)	Costs (\$)
S39, Carrying out a Level 1 activity without licence	<ul style="list-style-type: none"> Transporting regulated waste High risk waste storage 	DoE	FN	✓	-	4,000	500
		DoE	CC	✓	-	5,000	*
S70, Breach of licence conditions	<ul style="list-style-type: none"> Poor storage of contaminants Waste transport wrong vehicle 	LG	SE	✓	-	2,000	-
		DoE	SE	-	-	8,000	1,376
S112, Wilfully contravening EP Order	<ul style="list-style-type: none"> High risk waste storage Piggery discharge to creek 	DoE	CC	✓	✓	5,000	*
		DPI	SW	-	-	10,000	55
S119, Wilfully contravening EP Order	<ul style="list-style-type: none"> High risk storage toxic waste 	DoE	SE	✓	✓	*	*
S120, Unlawfully causing serious environmental harm	<ul style="list-style-type: none"> Release refrigerant gas to atmosphere (2 defendants) 	DoE	SE	-	-	20,000	2,335
		DoE	SE	-	✓	1,000	55
S121, Unlawfully causing material environmental harm	<ul style="list-style-type: none"> 1,500-2,000L oil to storm water 10,000L sewage to mountain High risk waste storage 2-300KL organic waste to river Discharge pesticides to water 	LG	SE	✓	-	10,000	13,552
		DoE	FN	✓	✓	25,000	8,512
		DoE	CC	✓	✓	5,000	15,727
		DoE	SE	-	-	1,000	21,178
		DoE	SE	-	-	30,000	21,139
S123, Unlawfully causing an environmental nuisance	<ul style="list-style-type: none"> Odours from gelatin factory Nuisance from dust offence 	DoE	SE	✓	-	50,000	24,219
		DoE	SE	-	-	12,500	4,355
S126, Placing contaminant where it could reasonably be expected to cause environmental harm	<ul style="list-style-type: none"> Waste water to stormwater Fuel/water mix to stormwater High risk storage toxic waste Syphoning fuel mixture to road Waste boxes stored in gully, rain washed waste to river 	DoE	SE	✓	-	7,500	576
		LG	SE	✓	-	2,000	1,166
		DoE	SE	✓	-	10,000	80,000
		DoE	CC	✓	-	200	285
		DoE	FN	-	-	1,000	1,057

AA = Administering Authority, DoE = Department of Environment,
 LG = Local Government, DPI = Department of Primary Industries
 C = Conviction, ✓ = Conviction, - = No Conviction
 D = Imprisonment in default, ✓ = Imprisonment in default, - = No Imprisonment
 * = costs recorded under other Section covered in same court action

The Section 70 breach of licence conditions for poor storage of wastes demonstrates the points made above in relation to low level enforcement options. In this case, the waste storage resulted in a risk of pollution, but no recorded release of contaminants to the environment, and no environmental harm or nuisance. The local government administering authority attempted to use the EMP provisions to address continued failure of the operator to improve waste storage. The case resulted in the operator receiving 3 criminal convictions, as well as a \$2000 fine. Authorised persons from the administering authority considered that the criminal convictions were too harsh a penalty in this case, but considered they had no realistic alternative to the process they used.

Other points to note from the table include:

- it shows a willingness by administering authorities to initiate prosecution actions, particularly by the South East Regional office of DoE, which recorded 10 of the 21 enforcement actions; and
- it also shows a high level of success with prosecutions for the EP Act to date.

It shows that some novel elements of the EP Act enforcement armory have been successful in practice. For instance, offences under Section 126 of the EP Act (placing contaminants where they might cause environmental harm) has been used in several successful prosecutions.

Figures 12a.i, ii and iii below shows operator responses to enforcement under the EP Act. Of the three issues considered for enforcement, ‘consistent enforcement across industry sectors’ was most often considered important, but ineffective by respondents. This response seems inconsistent with the notable success of the EP Act in court. Two likely sources of this apparent inconsistency are:

- that although there have been many successful prosecutions, these have been very poorly publicised, so operators are unaware that they have occurred; and
- that these prosecutions have in most cases (appropriately) dealt with only the most serious environmental offences. They have not usually focused at the level of compliance with licence conditions, or other areas that directly affect competitive advantages that could accrue to non-complying operators due to lower operating costs (the issue of high cost of complying is dealt with further below).

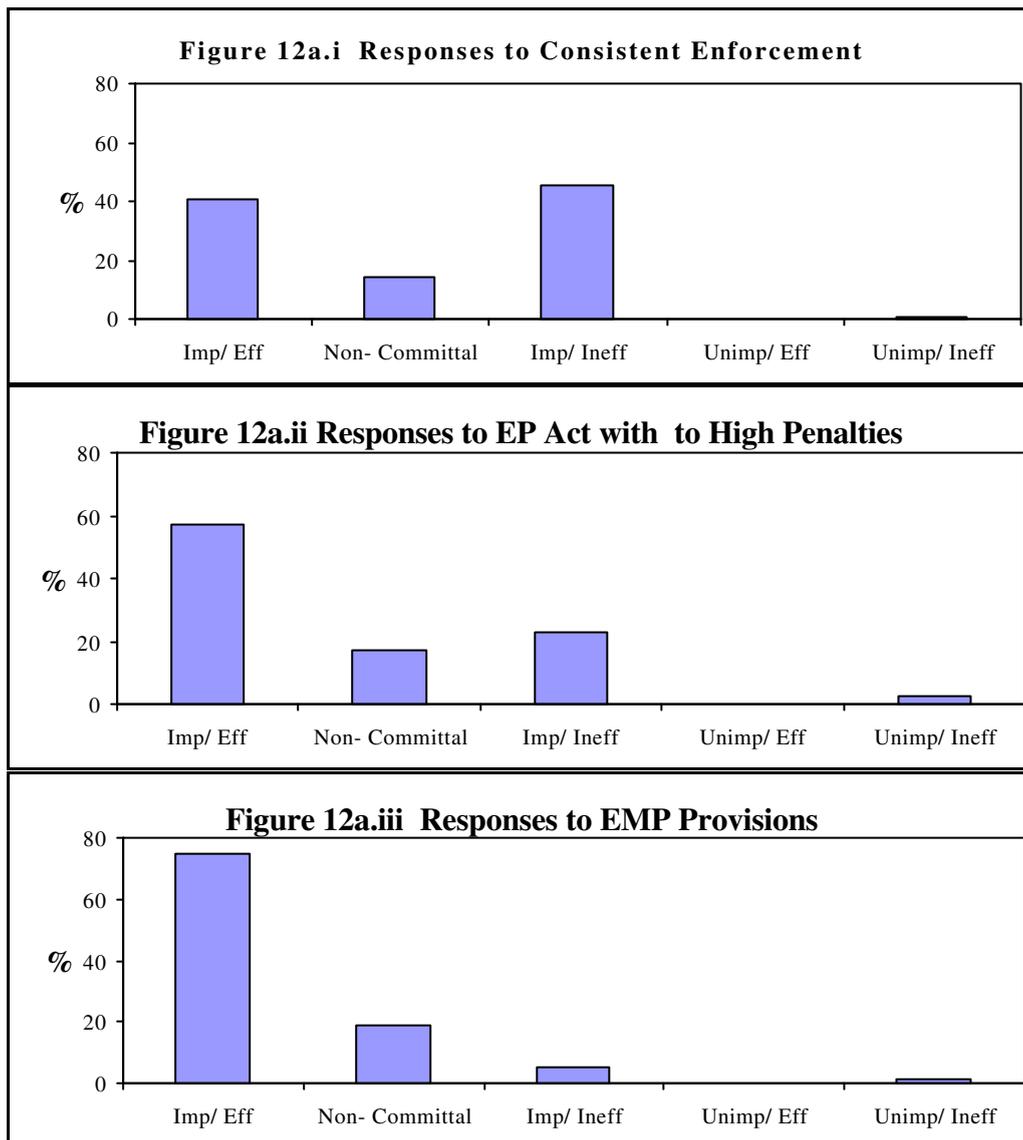


Figure 12b below indicates the main sectors that ERA operators perceive not to be covered by, or complying with the EP Act.

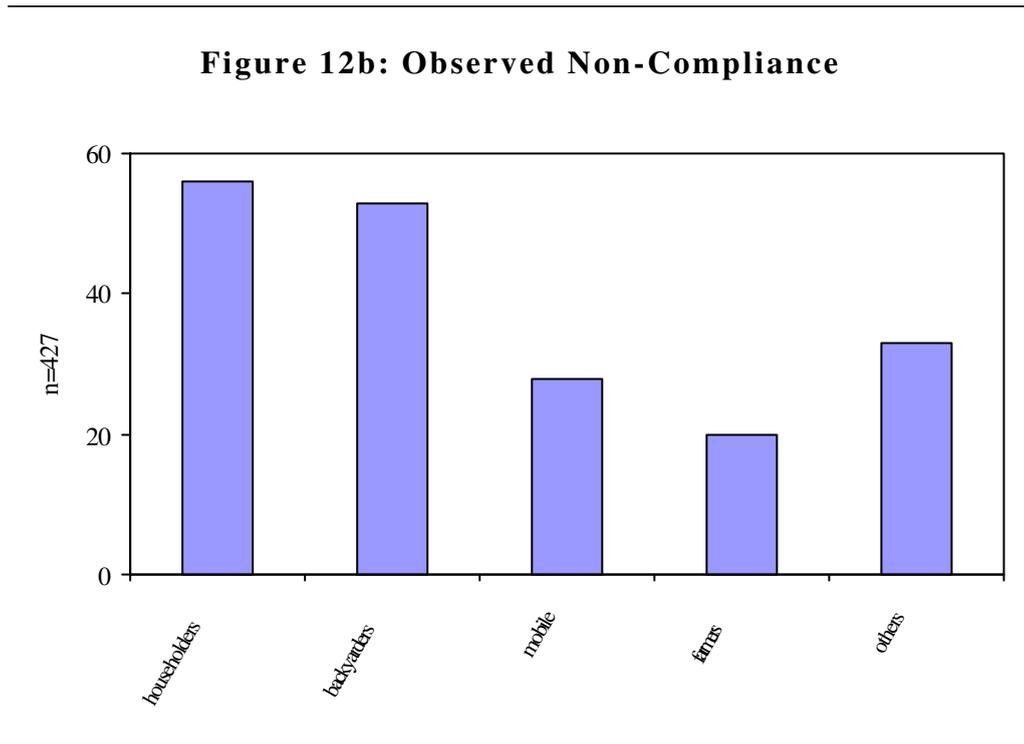
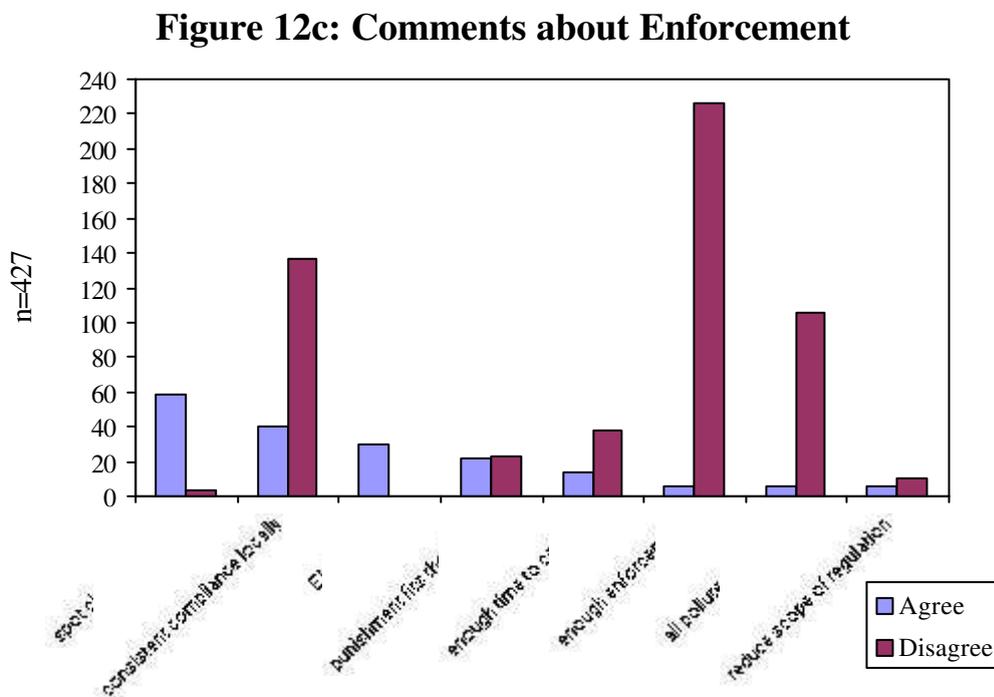


Figure 12c below shows operators comments about enforcement issues. The graph shows:

- considerable frustration among operators at a perceived lack of enforcement;
- that a major source of this frustration could be due to the limited scope of the EP Act, which many operators perceive is not targeting all potential polluters; and
- that many consider that consistent compliance has not been achieved locally.



Although many operators commented that more enforcement was needed, they emphasised several other features they would consider important for a successful EP Act enforcement system. In

particular, many operators wanted more clear and technical advice about their own compliance levels. Many operators, particularly of unaffiliated devolved activities wanted assistance to identify and prioritise actions they could take to address potential pollution problems.

Operators also emphasised the need for fair enforcement in which the punishment fitted the crime. As with other identified enforcement problems, the system they described was consistent with the structure and content of the EP Act, but would have more low level enforcement options, to tackle minor pollution incidents or risk issues.

Recommendations

- Address problems with Enforcement. For example;
 - provide information to operators about enforcement mechanisms and scope related to their particular environmental offences;
 - balance the enforcement of environmental requirements for ERAs and non-ERAs. Avoid 'petty' enforcement actions (for example avoid enforcement action when an equivalent action by a householder or backyarder would not incur a penalty);
 - continue site inspections, with an emphasis on enforcing licence conditions to ensure that complying operators are not financially disadvantaged compared to non-complying operators;
 - consider options for self-funding, including introducing site inspection fees to cover costs of extra assistance; and
 - bring in more low level enforcement options for all types of offences.

Ensure that any new enforcement options are urgently provided to all local government administering authorities, as well as the state government, with training to facilitate consistent application.

Communicate the outcomes from enforcement broadly, to operators and the general community, including consideration of publicising the results of enforcement actions, including through public notices in newspapers.

- Consider an Environmental Protection Policy for enforcement, that spells out low level offences for minor environmental offences, considering the following new offence provisions:
 - Breach of licence conditions not involving environmental nuisance (or harm) as an on-the-spot fine of around \$100 as a first offence, with fines increasing with subsequent cases of observed non-compliance;
 - Equivalent on-the-spot fines for backyarders, householders, farmers and other groups among which non-compliance is commonly observed;
 - Breach of licence conditions involving environmental nuisance, as a bigger on-the-spot fine (eg between \$500 and \$1000); and
 - Delayed on-the-spot fines with a warning mechanism, so that operators can avoid the fine if problems are addressed within a specified (short) time period.
- The Environmental Protection Policy for Enforcement could also:
 - Incorporate and formalise the DoE Enforcement Guidelines;
 - Establish a range of small-to medium scale enforcement options;
 - Identify circumstances appropriate to their use; and
 - Provide some flexibility in application at the local or regional level.

14 Incentives

Statistical analysis of incentives under the EP Act focused on the importance and effectiveness of:

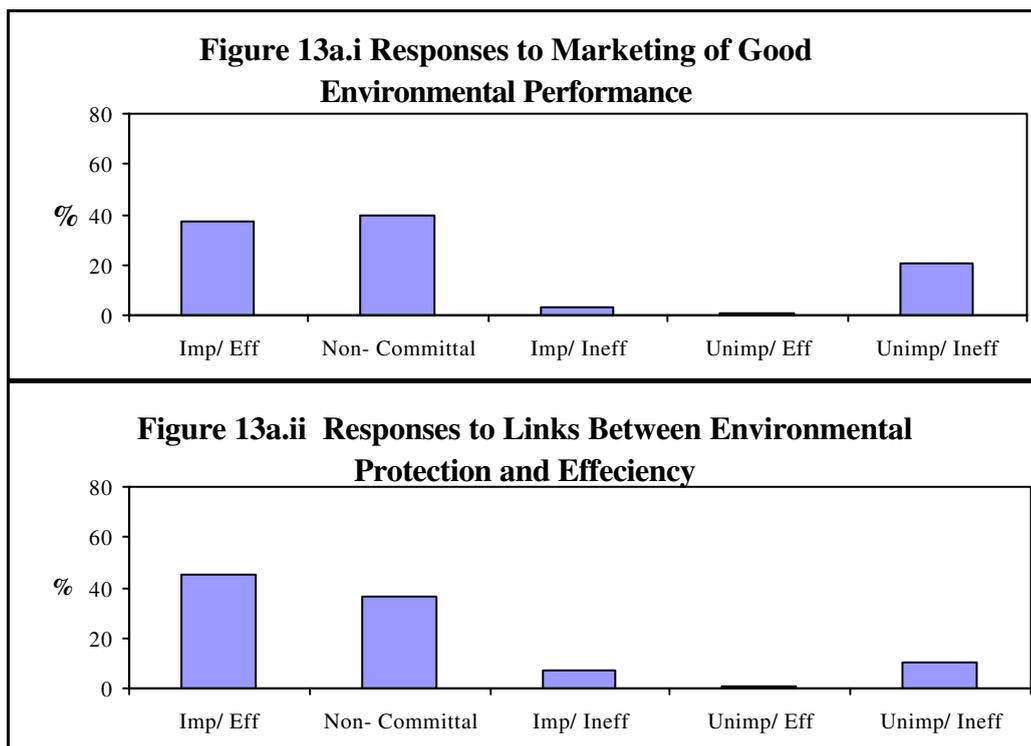
- Licence fee reductions for operators with low pollution risk; and
- Marketing opportunities derived from good environmental performance.

A third issue of the achievement of efficiency gains through good environmental performance was also addressed.

Results of analysis showed that the importance of incentives is viewed differently by different operators. Those perceiving environment/efficiency links see incentives as more important than those who are not¹⁷.

Dissatisfaction with incentives varied between regions. Operators in the Northern and South Eastern Regions were more dissatisfied with incentive systems than operators in South Western and Far Northern Regions.

Figures 13a.i, ii and iii below show importance and effectiveness ratings of incentive issues by ERA operators. They show that fee reductions have been perceived as the most important and effective incentive overall.



¹⁷ Figures R8.4.3, R8.4.4

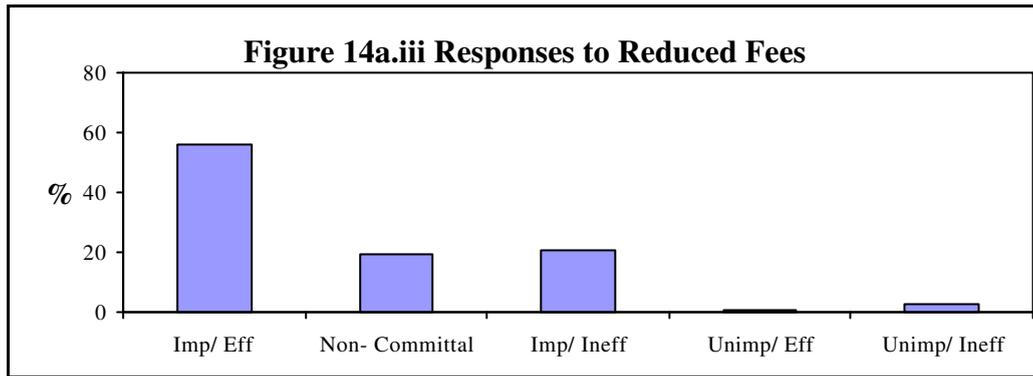


Figure 13b below shows unsolicited comments made by operators during inspections, and shows that they perceive many reasons for not polluting. A possible weakness of environmental protection regulatory system to date might be that it has not fully engaged with these issues that already work to encourage environmental compliance by operators.

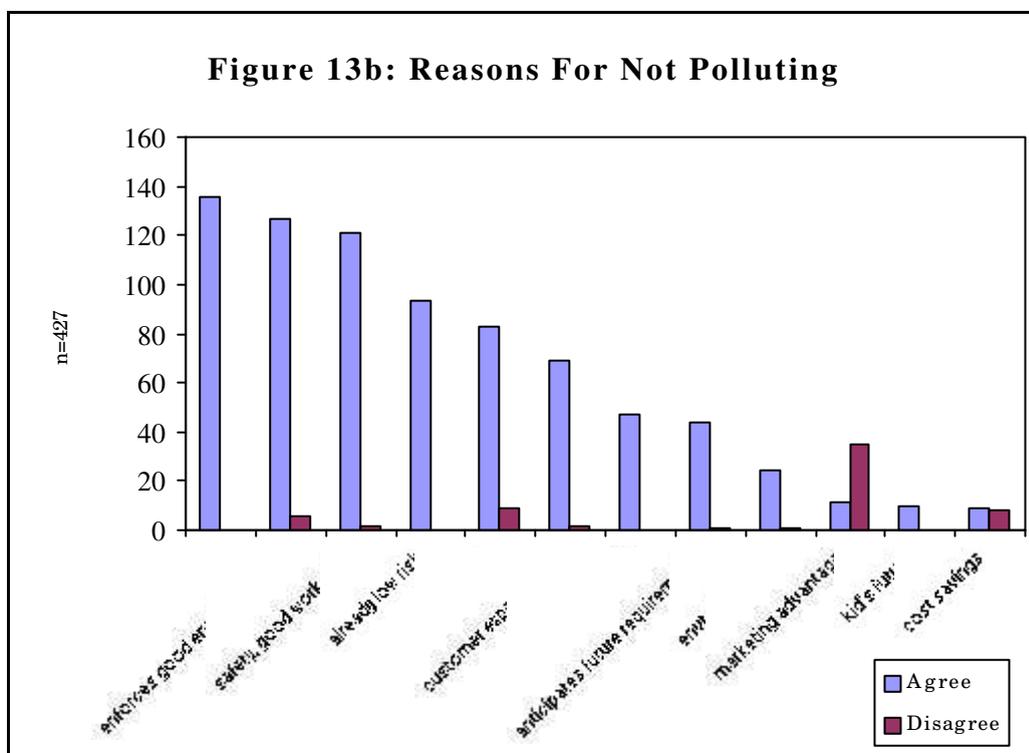


Table 13 below shows the different incentive systems used by different administering authorities. It shows that fee reductions are the most commonly used incentive, but that state government administering authorities are much less likely to use these options than are local government administering authorities. Other incentives are rarely used.

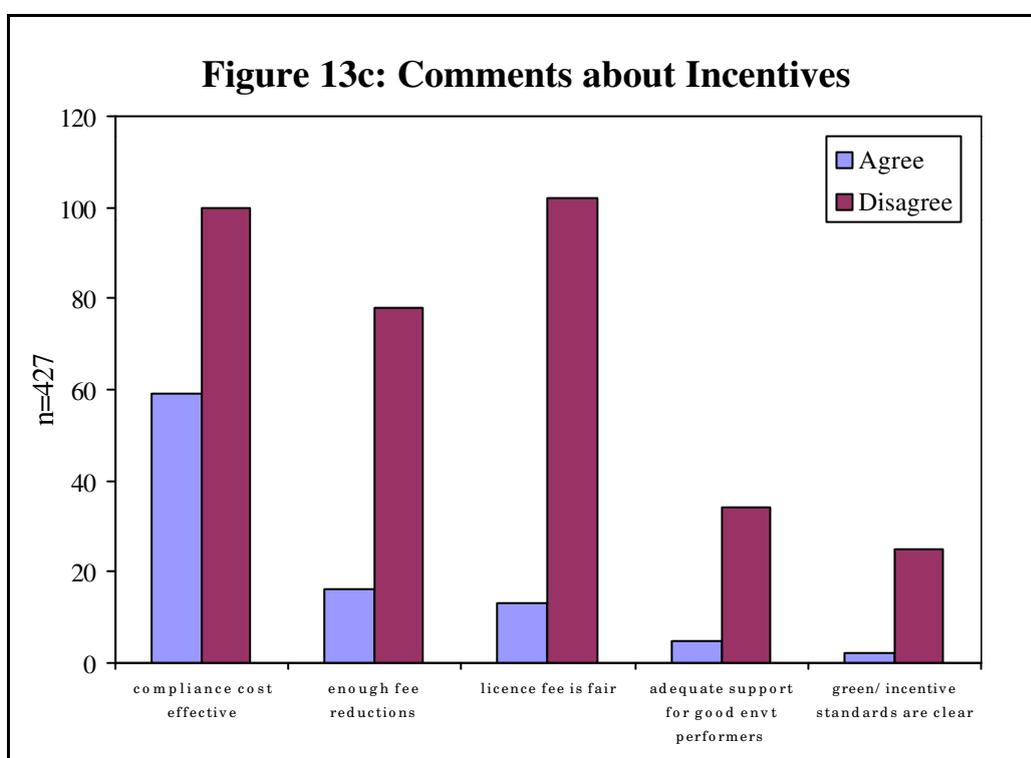
In addition to the relatively low use of incentives by administering authorities, inconsistency of incentives is another issue. The specifics of systems for fee reductions, marketing opportunities and other incentive systems vary between administering authorities. This probably decreases their value to operators, especially in areas where there is competition within ERA categories, across administering authority boundaries.

Table 13: Use of incentives by administering authorities.

Option	State Government		Local Government	
	Incentives	None	Incentives	None
Reduced licence fees	4	2	11	
Marketing opportunities	1		2	
Personal acknowledgment	1		1	
Cleaner production encouragement			2	
Good technical and admin advice	1			

Figure 13c below shows unsolicited comments made about incentives under the EP Act. It shows that the main sources of operator frustration with incentives are related to:

- the high cost of compliance;
- not enough licence fee reduction opportunities;
- licence conditions that are considered unfair, or too high; and
- perceived lack of support for good environmental performance.



Recommendations

- Consider developing an 'Incentives' Environmental Protection Policy. This would:
 - have an overall goal of making the benefits of compliance greater than the costs;
 - establish a service to provide advice to ERA operators, on low-cost solutions to environmental problems. This could be provided by trained and experienced personnel responding to requests for assistance by operators. The service would be separate to any enforcement system so that operators could safely seek advice. The service should be available to operators licensed by both local and state government; and
 - hardship provisions and technical information to provide simple, cost-effective pathways to compliance. These would be pitched at operators at risk of closure due to the financial implications of meeting environmental requirements. Information would facilitate the identification of realistic and practical actions that could be taken to avoid environmental harm (simple ways to meet the general environmental duty).
- Increase the benefits of compliance within operations. For example:
 - recognise the potentially high costs of compliance for operators of all licence types, and that the majority of operators perceive few practical benefits from compliance;
 - assist operators to perceive practical benefits from compliance, by drawing links between productive efficiency and environmental protection;
 - develop a system to enable environmentally responsible operators to market themselves on the basis of good environmental performance. The system should build on existing 'green licence' marketing systems, but be recognisable across administering authority boundaries (for instance, use a consistent symbol to designate operators who are meeting all environmental requirements);
 - provide community education on reasons and ways to identify and support good environmental performers;
 - further refine existing incentive licence systems, to provide a system that could readily be adopted and administered by any administering authority; and
 - directly support good environmental performers through government purchasing policies (with regard to price and environmental accountability).