Document no. 3:4
(2000–2001)

The Office of the Auditor General's investigation of Norway's compliance with the OSPAR Convention within industry, waste water management and agriculture

To the Storting (Norway's Parliament)

The Office of the Auditor General hereby presents Document no. 3:4 (2000-2001) The Office of the Auditor General's investigation of Norway's compliance with the OSPAR Convention within industry, waste water management and agriculture

Office of the Auditor General, 6 November 2000

For the Board of Auditors

Bjarne Mørk-Eidem
Chairman

CONTENTS

The Office of the Auditor General's investigation of Norway's compliance with the OSPAR Convention within industry, waste water management and agriculture

1. INTRODUCTION

In connection with its treatment of Proposition no. 39 (1994–95) the Storting gave its consent to the ratification of the OSPAR Convention, which is based on the Oslo Convention of 1972 and the Paris Convention of 1974. The OSPAR Convention is an environmental collaboration between 15 nations. The objective of the collaboration is to prevent and eliminate pollution of the marine environment in the north-east Atlantic.

By virtue of its membership in INTOSAI[1], the Office of the Auditor General is part of the Working Group on Environmental Auditing. INTOSAI has approved guidelines on how SAIs may co-operate on the audit of international environmental accords. Denmark, Iceland and Norway have performed parallel audits on various parts of the OSPAR Convention and their respective national regulations. The collaboration has helped to develop a joint approach for the audit. The audit reports from the Danish and Icelandic audits are expected to be submitted to their respective parliaments, Folketinget and Alltinget, in autumn 2000.

In Recommendation no. 205 (1998–99) to the Storting, the Standing Committee on Scrutiny and Constitutional Affairs stated that it regarded the Office of the Auditor General's involvement in environmental issues on both the national and international levels as positive, as this is an important area of political priority in which large amounts of public resources are used. The Committee stated that it believed it is important that the Office of the Auditor General performs audits in this policy area in the same way that it does in other areas and noted that the Office of the Auditor General was collaborating with Denmark and Iceland on the audit of Norway's compliance with the OSPAR Convention.

In ratifying the OSPAR Convention, Norway has undertaken to take all possible steps to protect the relevant maritime area and to ensure that national policies are in keeping with the provisions of the Convention. However, the general obligations of the Convention have been formulated

[1] The International Organization of Supreme Audit Institutions.

in such a way that they do not define specific requirements regarding national regulations. It is therefore up to the national authorities to design instruments that will ensure compliance with the Convention. Nevertheless, the Convention does specify, for example, that the authorities in each country must have a system for setting limits for emissions and a system for monitoring compliance with the conditions laid down in pollution permits. One of the main objectives of the Convention is to effect reductions in emissions of nutrients and hazardous substances.

The Office of the Auditor General studied whether the government administration's systems and use of policy instruments ensure satisfactory compliance with the OSPAR Convention in Norway. The auditors focused on the systems Norway uses to prevent pollution of the maritime area, including the systems for monitoring, sanctions and reporting. Special importance was attached to the authorities' knowledge of the situation regarding water pollution, setting of targets, implementation of measures and use of inspections and sanctions.

The report from the Office of the Auditor General's investigation is enclosed as a printed appendix. The audit criteria and presentation of the facts were submitted to the Ministry of the Environment and the Ministry of Agriculture in a letter dated 19 April 2000. The Ministries' comments were taken into account in the drafting of the final audit report. The audit report was submitted to the Ministry of the Environment and the Ministry of Agriculture in a letter from the Office of the Auditor General dated 4 July 2000. The Ministry of the Environment was asked to co-ordinate the Ministries' responses. The Ministry of Agriculture and the Ministry of the Environment have both submitted written statements concerning various aspects of the report (letters dated 26 July and 18 August 2000 respectively). The Ministries' remarks have been included in chapter 3 below.

2. SUMMARY OF THE INVESTIGATION

The Office of the Auditor General's investigation was delimited to the industrial sector, the waste water treatment sector and the agricultural sector and the environmental problems linked to nutrient enrichment (i.e. emissions of phosphorus and nitrogen) and hazardous substances. The period under investigation was 1995 to 1998.

A variety of documents were analysed including the OSPAR-convention, documents to the Storting, Acts of law, regulations and policy documents. Two questionnaires were answered by the Ministry of the Environment. This information formed the basis for the derivation of the audit criteria. In order to generate information about the implementation of the particular environmental provisions in question, statistics and public evaluations were reviewed. In this context, the auditors also conducted interviews with representatives from the Ministry of the Environment, the Norwegian Pollution Control Authority and the Ministry of Agriculture. A questionnaire was sent to all the county governors and municipalities in Norway to chart how the regional and local pollution control authorities fulfil their responsibilities in this area.

2.1 General

The audit demonstrated that avNorway has established a system for setting limits for discharges and a system for monitoring compliance with the conditions in discharge permits, as required by the Convention. Norway implements the provisions of the OSPAR Convention in keeping with the principle of sectoral responsibility, whereby each sector is responsible for implementing environmental measures in its area of jurisdiction.

The original target in the OSPAR Convention that the Contracting Parties should halve their emissions of nutrients by 1995 (based on the 1985 figures) has been modified, as it was discovered that the target figures were difficult to achieve. The goal of halving Norwegian discharges of phosphorous compounds was achieved in 1999, when inputs of phosphorus had been reduced by 49 % in the area from the Swedish border to Lindesnes. The discharges of nitrogen to the maritime area that is affected by Norwegian emissions (i.e. from the Swedish border to Strømstangen lighthouse and the inner Oslo fjord) have been reduced by 18 % in the same period. Norway has now extended the time limit for reaching the target of halving nitrogen emissions to 2005.

2.2 Compliance in the industrial sector

The audit demonstrated that despite the extensive monitoring system that has been established in the industrial sector, it does not appear that the authorities' reactions to breaches of emissions allowances have been sufficient to reduce the number of violations in the period 1995 to 1998. Companies that have been granted discharge permits must submit a report to the authorities each year on their compliance with the conditions and limits in their discharge permits. There has been a steady increase in the number of land-based industrial enterprises that have been granted discharge permits, from approx. 240 in 1995 to approx. 430 companies in 1998. The annual pollution reports that the companies submit to the Norwegian Pollution Control Authority show that deviation from the conditions in discharge permits was on average 57 % per year. The Norwegian Pollution Control Authority and the county governors perform risk-based inspections of companies that have been granted discharge permits. The audit revealed that some 40 % of the 109 companies that were inspected by the authorities in 1997 and the 131 companies that were inspected in 1998 had violated conditions in their discharge permits. The figures were also high for contravention of the internal control regulations, approx. 60 % in 1997 when 178 companies were inspected and 45 % in 1998 when 148 companies were inspected.

The monitoring system consists of two main elements: the companies' monitoring of their own activities and the authorities' monitoring of companies. The system of self-inspection is inherently paradoxical: harsh reactions from the authorities may lead to companies omitting to report instances of non-compliance, whereas mild reactions will not always have a sufficiently preventive effect.

The audit revealed that there is a general tendency for the authorities to use lenient forms of reaction in connection with detection of violations of conditions in pollution permits; for example, a written order to rectify the matter. Pollution fines and criminal charges were much less frequently used. The fact that the number of breaches has remained relatively stabile at a high level raises the question of whether it would be better to use more severe sanctions as the initial form of reaction in order to achieve a greater deterrent effect.

The consistently high level of violations within the industrial sector means that the authorities ought also to consider a more co-ordinated and varied use of legal, economic and pedagogical policy instruments. Although the OSPAR Convention recommends dissemination of information as a means to spread knowledge about best environmental practice, it

does not appear that this method has been widely used in Norway. In an interview, the Norwegian Pollution Control Authority stated that it provides little information to individual enterprises about less-polluting technology, pollutant removal systems, initiatives to stimulate better environmental performance and changes in regulations and penal rules. The representatives of the Norwegian Pollution Control Authority also said that they are reluctant to give information for fear of being held responsible for the choice of technology.

With regard to the performance monitoring database INKOSYS in the industrial sector, the majority of the county governors stated that they were dissatisfied with the system in terms of user-friendliness, the user manual and technical support and the training they were given. Because the system is not very user-friendly, there is a greater risk of poor effectiveness, registration errors in the system and consequently inadequate control and monitoring on the part of the superior authorities.

2.3 Compliance in the waste water treatment sector

According to the findings of the audit, the municipalities do not assume sufficient environmental responsibility – neither in terms of ensuring that the waste water treatment plants that they own satisfy the environmental requirements set by the county governor nor in connection with their monitoring of private waste water treatment facilities in their capacity as the local pollution control authority. In 1997 and 1998, 85 % and 55 % of the 20 municipal sewage plants that were inspected were found to be in breach of their pollution permits. In addition, the municipalities have been much slower to establish internal control systems than expected. The goal was that all municipal sewage plants would have internal control systems by the end of 1995, but as late as in 1998, 45 % of the 406 municipalities that were checked had still not finished implementing internal control systems.

With regard to the municipalities' role as the local pollution control authority, 57 % of the municipalities reported that they do not perform operating inspections of private waste water treatment facilities, as they are obligated to by the regulations. A new regulation, which will come into force on 1 January 2001, delegates even greater responsibility to the municipalities in the waste water management sector. The new regulation lays down that the municipalities shall issue discharge permits and monitor waste water treatment installations with a capacity of up to 1000 person equivalents. This represents a considerable increase in the municipalities' responsibilities in relation to the current regulations, under which the

municipalities have this kind of authority for facilities with a capacity of up to 25 person equivalents.

The audit revealed that the mildest form of reaction, a written order to rectify an instance of non-compliance, was the most common form of reaction used to sanction municipalities in the waste water treatment sector. Pollution fines were used, but to a lesser extent. Criminal charges were not used by the county governors in the four years studied in this audit.

Because pollution problems often arise in a different municipality to the one where the emissions occur, it has been decided that it is the county governor's responsibility to ensure that municipalities that cause pollution implement the necessary measures. The audit demonstrated that over half of the county governors seldom intervene when municipalities have excessive emissions of pollutants from sparsely populated areas.

2.4 Compliance in the agricultural sector

The audit demonstrated that some environmental measures in the agricultural sector were implemented to a minimal extent in cases where the need was greatest. Measures related to cultivation and tilling methods were implemented to a lesser extent in those parts of the country that drain into "vulnerable" area of the North Sea than in the rest of the country.

Most of the grant funding for alternative tilling and cultivation methods (58 %) did not go to areas with the greatest risk of erosion. The regulation that governs the grant scheme presupposes that funds will primarily be granted to areas that have a high erosion risk. A system has been established in the agricultural sector to assess environmental risks whereby agricultural areas are categorised into four groups according to whether they have a low, moderate, high or very high erosion risk. The grant scheme was set up in 1991, and since 1994 an average of NOK 93 million has been paid out for measures under the scheme each year. It is the municipalities that process and decide applications for the grant for alternative tilling methods, and it is questionable whether current practice is in keeping with the objective of the scheme and whether the allocation of the grant funds is always based on the criteria laid down in the regulation. In many cases, it appears that the grant scheme is not being administered with sufficient target orientation.

The OSPAR Convention recommends application of the polluter pays principle, whereby the party that pollutes shall bear the costs connected to preventing pollution and the costs associated with monitoring activities. In the agricultural sector, unfortunate environmental practice does not usually lead to increased costs, but rather to a reduction in grant funding or transfers from the central government. A more proactive use of the polluter pays principle might be an effective way of preventing pollution from agriculture. This principle has previously been applied in connection with taxes on artificial fertilisers, but this tax was removed in the Annual Agricultural Settlement for 1999. It is unlikely that current practice applies the polluter pays principle as defined in the OSPAR Convention.

The OSPAR Convention presupposes the use of best available techniques, including clean technology, in order to reduce and prevent pollution. In the agricultural sector, technology has been developed that makes better use of the nutrients in livestock manure, but the Ministry of Agriculture has not laid down requirements that this technology be used. The run-off of nutrients in connection with the use of manure may be an important reason for the nutrient enrichment of various water bodies, and in the agricultural sector, the Ministry should consider whether more stringent requirements ought to be set.

The investigation found that data has not been collected on the run-off of phosphorus and nitrogen from the agricultural sector since 1996. This lack of up-to-date information about environmental performance will make it difficult for the Ministry to tailor measures and instruments appropriately.

3. THE MINISTRIES' COMMENTS

3.1 The Ministry of the Environment's comments

In its comments regarding the Office of the Auditor General's investigation, the Ministry of the Environment pointed out that the decision to reduce emissions of nutrients was adopted as a recommendation under the Paris Convention in 1988. Recommendations of this nature are not legally binding. The Ministry also referred to the fact that no nation has yet managed to achieve the objective of reducing their inputs of nitrogen by half. In respect of hazardous substances, the Ministry pointed out that the strategy to eliminate discharges of hazardous substances within one generation was approved by the OSPAR Commission in 1998, meaning that the target is to be achieved by 2020. Mention was made of the fact that the Ministry and the Norwegian Pollution Control Authority are taking active steps within OSPAR to establish concrete measures in this area.

The Ministry of the Environment underlined that the reduction target for phosphorus has already been met, and that the target of a 50 % reduction in inputs of phosphorus and nitrogen has since been modified. The reduction target for nitrogen has now been postponed to 2005.

The Ministry of the Environment believes that the circumstances that are pointed out in the audit report are of relatively little relevance for Norway's compliance with the OSPAR Convention. The Ministry's general impression is that the audit represents a general review of Norway's pollution prevention policy in the areas of industry, waste water management and agriculture.

The Ministry of the Environment does not recognise that the audit gives grounds to query the effectiveness of the authorities' choice of policy instruments to implement environmental measures in the industrial, waste water and agricultural sectors. Reference is made to the fact that in the audit both the Norwegian Pollution Control Authority and the county governors expressed their satisfaction with the means available to them. The Ministry of the Environment also believes that the question of the appropriateness of the current use of instruments and their application ought primarily to be assessed on the basis of the results that have actually been achieved in relation to the targets and decisions of the Convention.

The Ministry of the Environment stressed that the sectoral objective for industry has very nearly been achieved for nitrogen. Actual compliance with goals in 1999 was 71 %, while the target figure for the sector was

75 %. Similarly, the quantitative targets for hazardous substances have been met. The Ministry therefore believes that the instances of non-compliance with the specifications in discharge permits that have been revealed do not have any direct relevance for Norway's compliance with the OSPAR Convention.

The Norwegian Pollution Control Authority performs risk-based inspections, whereby the agency monitors those enterprises in which the probability and the consequences of non-compliance with the regulations are greatest. In other words, inspections are not performed on a statistically representative sample of Norwegian industrial enterprises. According to the Ministry, the statistics do not indicate anything about the nature of the breaches and whether the breaches have serious environmental consequences or not.

The Ministry of the Environment refers to the audit where it is stated that "although the OSPAR Convention recommends dissemination of information as a means to spread knowledge about best environmental practice, it does not appear that this method has been widely used in Norway". The Ministry also refers to the Norwegian Pollution Control Authority's statements in the audit interview that "the Norwegian Pollution Control Authority is reluctant to provide industrial enterprises with information about new technology that pollutes less and about the applicable regulations". In the Ministry's opinion, this is a slightly misleading description of the situation. The Norwegian Pollution Control Authority has informed the Ministry of the Environment that it uses information extensively as an instrument, for example, it publishes booklets etc. about technical solutions for certain industries and guidelines based on OSPAR and EU documents. Moreover, information strategies are always drawn up in connection with the introduction of new regulations. However, the Norwegian Pollution Control Authority *is* reluctant to make concrete recommendations to individual companies about what pollution abatement technology to choose.

According to the Ministry of the Environment, the Norwegian Pollution Control Authority has initiated a resource-intensive and costly upgrade of the administrative database INKOSYS.

In the Ministry of the Environment's opinion, the fact that the municipalities do not assume sufficient environmental responsibility – neither in their capacity as the owner of waste water treatment facilities nor in their capacity as a local pollution control authority – must be considered in light of the developments in the last few years. Reports to the Storting have given the impression that the central government intends to inter-

vene less in the details of municipal matters. This has led to the central pollution control authorities having less direct contact with the municipalities than with trade and industry and other private enterprises. The time limits for compliance with the conditions laid down in discharge permits have generally been subject to negotiation, which, according to the Ministry, has yielded positive results in the form of extensive measures and reductions in emissions of harmful substances. Reference is made to the fact that the municipalities have achieved an overall reduction in discharges of phosphorous compounds of 61 % in the period 1985 to 1998 and a reduction in discharges of nitrous compounds of 13 % in the same period.

The Ministry of the Environment agrees that discharges from areas with sparse residential and recreational buildings in certain parts of the country represent a major cause of the remaining local pollution problems. This has become more significant because of the large reductions in major point source discharges from the municipal sector and other sources. The Ministry of the Environment also agrees that many municipalities have not achieved the defined or expected results in their administration of the Pollution Control Act in this respect. However, the Ministry of the Environment is of the opinion that these emissions have little significance for pollution levels in water bodies that are of national and regional interest.

In the opinion of the Ministry of the Environment, the municipalities' independent responsibility indicates that it is up to the municipalities to decide what priority they want to ascribe to pollution from sparsely populated areas. The municipalities' supervisory authority is now being extended to include waste water treatment plants with a capacity of up to 1000 person equivalents precisely because the Ministry believes that the remaining emissions from small waste water treatment facilities primarily cause only local pollution problems.

The Ministry of the Environment does not agree with the Office of the Auditor General that the large number of violations of the conditions in discharge permits in the waste water treatment sector indicates that new policy instruments are required that will ensure greater compliance with the environmental requirements. The Ministry of the Environment claims that the use of policy instruments must be assessed in relation to the results that are achieved and that it is too early to assess the effectiveness of the current choice and application of policy instruments, since the time limit for the objective of halving discharges of nitrous compounds has been extended to 2005.

3.2 The Ministry of Agriculture's comments

The Ministry of Agriculture refers to the fact that the starting point for all the efforts to reduce pollution from agriculture in Norway is Norway's international commitments and national objectives for local pollutions. The policy instruments intended to reduce pollution from agriculture are therefore designed on a broader basis than the obligations in the OSPAR Convention. An important guiding principle in the development of the policy instruments was the decision that the pollution problems in the North Sea and Norwegian watercourses were to be resolved in a co-ordinated way.

In connection with the scope of the schemes to introduce alternative tilling and cultivation methods and priorities with regard to erosion risk, the Ministry of Agriculture says that these schemes did not function with the intended geographical precision until 1995. Nevertheless, the Ministry underlines that the goal in the regulation relating to alternative tilling and cultivation methods was extended in 1996 with a view to reducing nutrient run-off from agricultural areas in general, including run-off of nitrogen. The background for the amendments in the regulation in 1996 was new knowledge about the impact of the measures on nitrogen run-off. At the same time, there was a need for a greater concerted effort in order to reduce the run-off of nitrogen. Reductions in nitrogen run-off are less directly linked to erosion risk than is the case for run-off of phosphorous compounds. This entailed that it was more important than before to introduce measures across large areas in order to achieve the goals for reduced nitrogen run-off from agricultural land. The Ministry therefore believes that the practical implementation of the scheme "alternative tilling and cultivation methods" ought to be assessed on the basis of the 1996 amendment to the regulation and that the municipalities' current practice is in compliance with the objectives of the regulation.

The Ministry added that new scientific knowledge about environmental aspects of different methods of cultivating crops is vital for a cost-efficient environmental policy in agriculture. The Ministry therefore believes that it is crucial that the regulation regarding the grants for alternative tilling and cultivation methods is continuously amended in keeping with developments. Once soil charts have been drawn up and maps of high erosion risk areas are more widely available, administration of this scheme will be easier and more effective.

In its letter of response, the Ministry of Agriculture pointed out that most of the grants for "alternative tilling and cultivation methods" went to the catchment area of the part of the North Sea that is adversely affected by

Norwegian discharges. The Ministry referred to the fact that 87 % of the grant funding went to this vulnerable area, compared with 13 % that went to less sensitive areas.

With regard to the polluter pays principle, the Ministry of Agriculture claims that the major part of the environmental investments is borne by the users, who must also cover in full the costs of operating and maintaining all systems that have an environmental impact. An example of the application of the polluter pays principle is the central government financing support for establishing manure storage facilities, where the grant funds constitute approx. one third of the approved cost estimate.

With regard to types of grants that are intended to stimulate better environmental practice, the principles applied in Norway are very similar to the fundamental principles applied in other countries and in the EU. For example, an important principle is that compensation may be granted for some increases in expenses and decreases in revenue, and extra funds may be granted to stimulate more environmentally sound practice.

The Ministry of Agriculture pointed out that there are requirements prescribed in regulations regarding good environmental practice in crucial areas. For example, there are regulatory requirements for the submission of an obligatory annual fertiliser plan and sufficient spreading area for manure. If these requirements are not met, money is deducted from the grants paid to the users. The amount of money deducted is such that it is financially unviable to contravene these provisions. In these kinds of cases, it would probably be extremely complicated from an administrative point of view to introduce forms of reaction that more directly reflect the real cost of an instance of pollution according to a literal interpretation of the polluter pays principle.

In respect of the requirement regarding the use of the best available techniques, the Ministry of Agriculture stated that the requirements regarding cost-effectiveness in connection with adaptations to environmental policy presuppose that the necessary adjustments can be made on the basis of local conditions. The various different natural conditions, such as the type and quality of soil and the local topography, necessitate that there must be a selection of different technological solutions that can be used. Today, there are a number of different methods for spreading manure using a variety of different technologies that all satisfy certain environmental requirements. The Ministry of Agriculture has therefore chosen not to lay down provisions regarding the use of specific technologies. Other principles, such as cost-effectiveness, further entail that the Ministry is cautious about directing choices of technological solutions.

Total losses of phosphorous and nitrous compounds from agriculture to the vulnerable area in the North Sea have been calculated using the TEOTIL model, which is administered by the Norwegian Pollution Control Authority and the Norwegian Institute for Water Research (NIVA). The Ministry holds that the calculation of the discharge figures for 1996 together with information about the implementation of new schemes in agriculture the following year still has a high information value in terms of adaptation of instruments.

4. THE OFFICE OF THE AUDITOR GENERAL'S OBSERVATIONS

A pivotal element of the OSPAR Convention is that the Contracting Parties must have a system to regulate activities that cause pollution and a system to monitor compliance with the regulations. The audit revealed that Norway has established systems to serve both these purposes. However, the audit also demonstrated that there is extensive violation of the specifications in discharge permits in the industrial sector and the waste water management sector. The Office of the Auditor General agrees with the Ministry of the Environment that the instruments used ought to be assessed in relation to the results achieved; however, the audit indicates that the effectiveness of the current use of policy instruments can be queried.

The Ministry of the Environment has pointed out that the OSPAR Commission's objective of halving the run-off of nutrients is worded as a recommendation and is therefore not legally binding. The Office of the Auditor General agrees with this claim, but would also refer to the fact that the Ministry has presented these objectives to the Storting, cf. Report no. 64 (1991–92) to the Storting concerning Norway's implementation of the North Sea Declarations.

In order to achieve the greatest possible environmental benefits, it is important that industrial enterprises and municipal sewage plants comply with the environmental provisions laid down by the central government authorities. The Office of the Auditor General would underscore the importance of the central government authorities following up instances of non-compliance with resolutions passed pursuant to legislation with the necessary measures. It is also questionable whether it is judicious of the central government to allow the municipalities to decide whether they want to perform the administrative tasks with which they have been charged in the regulation concerning separate waste water treatment systems.

The pollution control authorities have access to a number of quite powerful instruments in the form of systems of monitoring, inspections and sanctions. Both the Norwegian Pollution Control Authority and a majority of the county governors stated that they are satisfied with the sanctioning means they administer; however, the audit demonstrated that these authorities seldom choose to make active use of all the instruments available to them when they detect instances of non-compliance with the environmental provisions. It can therefore be queried whether the use of stricter sanctions as the first form of reaction might result in fewer violations of the environmental requirements.

The Office of the Auditor General regards it as positive that the Norwegian Pollution Control Authority uses information as a policy instrument; for example, publications about technical solutions for individual industries and guidelines based on OSPAR and EU documents. However, the Norwegian Pollution Control Authority is somewhat reticent in issuing concrete recommendations to individual companies regarding pollution abatement technology. Although it is not the authorities' responsibility to choose technological solutions for individual companies, more direct information about the various technological systems on the market and what is currently considered best environmental practice might help individual companies that do not have own expertise in these fields to comply with the environmental requirements.

The Ministry of the Environment stated that the central government pollution control authorities are less authoritative in their interactions with the municipalities than they are with trade and industry and other private enterprises, because the central government has a policy of not to intervene in the details of local government. In concrete terms, this has manifested itself in requirements in the discharge permits granted to municipal sewage plants being made subject to negotiation. The Office of the Auditor General does not see how this can be interpreted as management of the details of municipal business when central government authorities issue discharge permits for municipal waste water treatment facilities. There are also grounds to query the central government pollution authorities' practice in affording the municipalities special treatment.

The Office of the Auditor General has noted that whilst normative instruments are the most commonly used instruments in the waste water treatment sector and the industrial sector, in the agricultural sector economic measures are more frequently applied. According to the audit, there are some weaknesses in the authorities' monitoring of the use of the available policy instruments and their overview of the environmental results achieved in the agricultural sector. There is uncertainty surrounding the model for calculation of total emissions of phosphorus and nitrogen from the agricultural sector. The model, which is administered by the Norwegian Pollution Control Authority and the Norwegian Institute for Water Research, is supposed to provide information about the overall results of the various schemes, but no figures have been generated for discharges of nutrients from agriculture since 1996. The Office of the Auditor General queries the Ministry of Agriculture's claim that the figures for 1996, together with information about the implementation of new measures in agriculture, provide adequate grounds for an appropriate adaptation of the instruments to meet the environmental challenges.

The Ministry of Agriculture has concluded that the measures associated with alternative tilling and cultivation methods have not been implemented with the intended geographical accuracy, but the Ministry believes precision was improved when the regulation was amended in 1996. In order to achieve reductions in discharges of phosphorous compounds, it is crucial that the schemes are directed towards areas that have a high erosion risk, which entails concentrating the flow of funds to specific limited areas. By contrast, in order to attain maximum reductions in discharges of nitrous compounds, measures need to be implemented as widely as possible. In other words, measures need to be applied differently and ascribed different priorities to fulfil the reduction targets for phosphorus and nitrogen. The Office of the Auditor General queries whether the allocation criteria in the regulation adequately take account of the conditions necessary to reduce emissions of nitrogen.

The Office of the Auditor General agrees with the Ministry of Agriculture that most of the grant funding paid out for "alternative tilling and cultivation methods" have gone to areas that have run-off to the vulnerable area in the North Sea. Nevertheless, the Office of the Auditor General would point out that to date this scheme has not been effective in attaining the prescribed degree of implementation within the most critical areas. A key measure in the scheme was to reduce the amount of land ploughed in the autumn. However, calculations from Statistics Norway indicate that the percentage of cereal-growing areas that were still being ploughed in the autumn in 1997/98 was higher in the "vulnerable area" than in the rest of the country as a whole. There may be special challenges associated with farming in the areas of the country concerned that render it difficult to implement the measures to a satisfactory degree. It can therefore be queried whether the Ministry should assess alternative schemes in order to improve the degree of implementation of the prescribed measures in the areas where the needs are greatest.

A central element of the OSPAR Convention is the principle that the polluter shall bear the costs connected with pollution, including costs associated with monitoring, prevention and reduction measures. The Office of the Auditor General agrees with the Ministry of Agriculture that central government grants can be a positive means to encourage implementation of environmental measures, and according to the findings of the audit, most of the measures to reduce run-off of nitrogen and phosphorus are financed by these kinds of grants. However, the purpose of the polluter pays principle is to make actions that lead to pollution financially unviable. It can therefore be queried whether it is possible to integrate this principle more fully into the apparatus of policy instruments used in the agricultural sector.

5. THE MINISTRY OF THE ENVIRONMENT'S RESPONSE

The findings of the audit were presented to the Ministry of the Environment, which also obtained comments from the Ministry of Agriculture. The Ministry responded in a letter dated 9 October 2000:

"Reference is made to the Office of the Auditor General's letter of 25 September 2000, in which Document no. 3:X (2000–2001) to the Storting concerning the aforementioned audit was sent to the Ministry for comment.

The Ministry has obtained comments from the Ministry of Agriculture, which are included in the last four paragraphs of this letter.

The Ministry would like to make the following comments regarding chapter 4 of this document, "The Office of the Auditor General's observations".

In the first paragraph of chapter 4, it is stated that a pivotal element of the OSPAR Convention is that the Contracting Parties must have a system to regulate polluting activities and a system to monitor compliance with the regulations. The audit revealed that there is extensive violation of the specifications in discharge permits in the industrial sector and the waste water management sector, and the Office of the Auditor General therefore queries the effectiveness of the current use of policy instruments.

The Ministry would like to point out that the pivotal element of the OSPAR Convention is that the Contracting parties together adopt programmes and measures to protect the marine environment in the north-east Atlantic. In this context, the Ministry holds that it is relevant to underline that the Office of the Auditor General did not detect any indications that the Norwegian authorities are failing to comply with the legal decisions and recommendations of the OSPAR Convention.

In order to be able to fulfil the measures nationally, it is necessary that there is a system to regulate and monitor polluting activities. However, the OSPAR Convention does not contain any specific rules concerning monitoring or sanctions; instead it prescribes that the authorities in the individual countries shall provide for a system for regular monitoring and inspection to assess compliance with authorisations and regulations. There are no requirements regarding the frequency of inspections or the forms of sanctions. This is a matter for the individual countries to decide, and in Norway, the framework conditions in these respects are laid down in the Pollution Control Act.

The Ministry has noted that the Office of the Auditor General is of the opinion that the effectiveness of the current use of policy instruments can be queried. This is of course a question that the pollution control authorities constantly assess.

In the second paragraph of chapter 4, it is stated that the Office of the Auditor General is aware of the fact that the OSPAR provision regarding halving nutrient run-off is worded as a recommendation and is therefore not legally binding, but would also refer to the fact that the Ministry has presented these objectives to the Storting, cf. Report no. 64 (1991–92) to the Storting concerning Norway's implementation of the North Sea Declarations. In this context, the Ministry would like to point out that the Storting has also been informed that the national targets in this area have been amended, cf. the Ministry of the Environment's annual budget propositions: Proposition no. 1(1998–99) to the Storting and Proposition no. 1 to the Storting (1999-2000); and Report no. 8 (1999–2000) to the Storting "The Government's Environmental Policy and the State of the Environment in Norway". Further, in Recommendation no. 256 (1999–2000) to the Storting relating to the latter Report to the Storting, the majority of the Standing Committee on Energy and the Environment approved the new national targets for reductions. The Ministry would also refer to its previous comments, included in section 3.1 of this Document.

In the third paragraph of chapter 4, the Office of the Auditor General queries the judiciousness of the central government allowing the municipalities to decide whether they want to perform the administrative tasks with which they have been charged in the regulation concerning separate waste water treatment systems. The new regulation concerning separate waste water treatment systems that will come into force on 1 January 2001 authorises the municipalities to issue discharge permits and monitor sewage plants that have a capacity of up to 1000 person equivalents. This may entail slightly different practices in the individual municipalities. However, it is a general political objective for the entire Government to grant the municipalities greater authority in connection with environmental issues.

With reference to the comments concerning monitoring practices in the fourth paragraph of chapter 4, the Ministry would like to underscore that it is the Norwegian Pollution Control Authority, the county governors and the municipalities that monitor compliance with the specifications laid down in regulations and discharge licences in connection with environmental issues. In the event of contravention of the regulations and/or licensing conditions, these authorities then consider which of the means

of sanctioning available to them to use; for example, imposition of pollution fines or reporting the matter to the police. The extent to which harsh reactions and forms of punishment should be used is a matter of judgement and is always subject to debate. The Ministry will consider signalling to external agencies that they ought to use harsher forms of sanctions more frequently as their first form of reaction.

In the fifth paragraph, the Office of the Auditor General suggests that provision of more direct information about the various technological systems on the market and what is currently considered best environmental practice might help individual companies that do not have enough expertise in these fields to comply with the environmental requirements. The Ministry would like to point out that the Norwegian Pollution Control Authority regards the provision of general guidelines about best available techniques and best environmental practice in different industries as an important task. However, in view of its role as an exerciser of authority, the Norwegian Pollution Control Authority does not regard it as natural for it to make concrete recommendations to individual companies concerning their choice of pollution abatement technology.

With regard to the relationship to the municipalities, discussed in the sixth paragraph of chapter 4, the Ministry maintains that the practice that the central government authorities have applied in relation to the municipalities has yielded positive results in the form of implementation of comprehensive measures and reductions in discharges.

The schemes and measures in the agricultural sector are analysed and evaluated each year in connection with the annual Agricultural Agreement. In addition to the annual impact assessment reports compiled by Statistics Norway, results from research, surveys and official studies and reports relating to the policy instruments and measures, including the potential for reduction of run-off of nutrients, form the grounds for the design and development of policy instruments. Special analyses of the measures are also undertaken in connection with the development of policy instruments. The calculation model, which is mentioned in the seventh paragraph of chapter 4 above, is used as the basis for national and international reporting.

The regulation relating to alternative tilling and cultivation methods has been amended several times, as mentioned in the eighth paragraph of chapter 4. The Ministry of Agriculture attaches importance to ensuring that changes in the use of the policy instruments are made on the basis of knowledge that is documented by research and analyses or in official studies and reports. In recent years, greater priority has been given to

measures that are effective in reducing nitrogen run-off, for example, cultivation of cover crops, lighter autumn ploughing and direct sowing without any special tilling. The Ministry of Agriculture will continue its annual review of this regulation and reassess the allocation criteria and the use of alternative policy instruments, with the aim of increasing the degree of implementation of measures in those areas where the needs are greatest.

In the tenth paragraph of chapter 4, the Office of the Auditor General queries whether it is possible to integrate the polluter pays principle more fully into the apparatus of instruments used in the agricultural sector. The Ministry of Agriculture would like to point out that the polluter pays principle now forms the basis for all measures to reduce discharges from point sources, i.e. manure pits, silos and silage effluent plants. The special environmental grant to improve these kinds of manure-storage facilities was discontinued on 31 December 1998. Breaches of provisions concerning point source discharges are treated pursuant to the Pollution Control Act.

As a means of reaction, deducting money from grants and subsidies in the event of non-compliance with regulatory requirements regarding good environmental practice, including the duty to prepare a fertiliser plan and the adaptation of the number of livestock kept according to spreading area, is regarded as being in accordance with the polluter pays principle. Importance has been attached to employing a form of reaction that is quick and economical in terms of administrative costs. The Ministry of Agriculture believes that the use of the polluter pays principle in agriculture is in keeping with the application of this principle in the other North Sea countries. The Ministry of Agriculture keeps itself informed about the policy instruments that are being developed and used in the other OSPAR countries, partly with a view to ensuring an effective prioritisation of the various different principles to reduce pollution from agriculture."

6. THE OFFICE OF THE AUDITOR GENERAL'S STATEMENT

The Office of the Auditor General would like to underline that the audit demonstrates that the Norwegian authorities have established those systems required by the OSPAR Convention to regulate polluting activities and monitor compliance with the regulations. However, many breaches of the requirements laid down by the authorities as measures to ensure the implementation of the Convention were detected, and harsh sanctions were seldom employed in reaction to these breaches. It can therefore be queried whether the authorities' are implementing the national regulations correctly. The Office of the Auditor General has noted that the Ministry intends to consider communicating to external agencies that harsher forms of sanctions ought to be implemented more frequently as the first form of reaction.

The audit revealed that 57 % of the municipalities have not performed the monitoring activities that they have been delegated by the central government. The Ministry stated that it is a general political objective for the Government to grant the municipalities greater authority in connection with environmental issues in all areas. The Office of the Auditor General would like to point out that the overall national responsibility for environmental matters remains with the Ministry, even if it delegates authority to other agencies.

The Ministry of the Environment stated previously that the central government authorities are more lenient in their exercising of authority in relation to municipalities than they are in relation to businesses and other polluting private enterprises. The Office of the Auditor General is of the opinion that a public supervisory authority affording government agencies special treatment may give other polluters an undesirable impression.

The audit showed that total performance figures have not been obtained for reductions of discharges to water bodies of phosphorus and nitrogen from agriculture since 1996. The Office of the Auditor General is assuming that the model for the calculation of discharges of nutrients from agriculture will be improved and that in the future the results achieved will form the basis for the adaptation of measures and policy instruments. The Office of the Auditor General has noted that the Ministry of Agriculture has stated in its annual evaluation of the regulation relating to alternative tilling and cultivation methods that it is going to reassess the allocation criteria and the use of other policy instruments in order to increase the degree of implementation of measures in areas where the needs are greatest.

This report will be submitted to the Storting.

Approved at the Office of the Auditor General's meeting 24 October 2000.

Bjarne Mørk-Eidem **Eivind Eckbo**

Tore Haugen **Helga Haugen**

Therese Johnsen

Appendix

The Audit Report

Norway's compliance with the OSPAR Convention
within industry, waste water management and agriculture

TABLE OF CONTENTS

Summary

The objective of the OSPAR Convention is to prevent and eliminate pollution in the north-east Atlantic. Through its ratification of the Convention, Norway has agreed to adhere to the principles of the Convention to reduce Norwegian pollution of this maritime area. The Office of the Auditor General has studied whether the government administration's choice of measures and use of policy instruments ensures satisfactory compliance with the OSPAR Convention within industry, waste water management and agriculture.

The original goal of halving discharges of nutrients by 1995 on the basis of the 1985 figures has been extended, as the targets proved difficult to realise. Norway has achieved its quantitive targets for reductions of emissions of hazardous substances, but further reductions are still necessary to attain the goal of ceasing all emissions of hazardous substances to the environment within one generation.

Against the background of the relatively large number of violations of specifications in discharge permits in the industrial sector, it may appear that it would be appropriate for the authorities to assess a more co-ordinated application of legal, economic and pedagogical policy instruments. In the industrial sector, the most frequently used sanctions to implement environmental measures are the legal instruments available through the licensing system; economic instruments are also used, but to a lesser extent. With regard to the use of pedagogical tools, the audit revealed that the Norwegian Pollution Control Authority is reticent in providing industrial firms with information about new technologies that are less harmful to the environment and about applicable regulations.

The Norwegian Pollution Control Authority primarily uses mild forms of reaction in connection with violations of licensing conditions; most frequently, written orders to remedy the errors. The Norwegian Pollution Control Authority believes that this is effective, despite the fact that the number of violations has not diminished. The monitoring system is partly based on the companies themselves reporting breaches of environmental requirements. Stricter penalties for violations may discourage companies from reporting breaches and may lead to unfortunate circumstances being kept secret. The structure and methods of the monitoring system may therefore actually hinder the authorities in using the instruments available to them in full.

In the waste water treatment sector, the municipalities play two roles – they act as both polluters and pollution control authorities. The audit revealed that the municipalities do not fulfil their responsibilities adequately in either of these roles. The county governors' inspections of municipal waste water treatment plants revealed a high percentage of violations of the conditions regarding emissions. In 1997, there was 85 % non-compliance; in 1998, this figure had sunk to 55 %. The auditors also found a high percentage of non-compliance with the provisions concerning internal control. As late as in 1998, approximately half of the municipalities did not have functioning internal control systems. The Office of the Auditor General's investigation also demonstrated that some 57 % of the municipalities did not perform operational inspections of private waste water treatment facilities, as they are obligated to do through regulations.

Some environmental measures in the agricultural sector have been implemented to only a minor extent in areas where the needs and the risk of erosion are greatest. Some of the measures associated with alternative tilling and cultivation methods have been implemented to a lesser extent within the catchment area of the vulnerable area in the North Sea than in the rest of the country as a whole. In addition, 58 % of the grant funds for alternative tilling and cultivation methods was allocated to areas that do not have the greatest environmental risks (areas that have high and extremely high erosion risk). The regulation that governs the grant scheme "alternative tilling and cultivation methods" requires that the grant should primarily go to areas that have a high risk of erosion. It is therefore necessary that the Ministry assesses the need to exercise greater control in order to ensure that the grant funds are used in areas that have the highest risk of erosion and water pollution.

The audit demonstrated that data have not been obtained about the run-off of nutrients from the agricultural sector since 1996. This lack of information about the environmental results achieved makes it difficult for the Ministry to determine how best to adapt the measures and policy instruments to serve the needs. It is therefore necessary to consider improving the systems for overall administration and monitoring of the measures and schemes that are intended to reduce run-off of nutrients from the agricultural sector.

1. Introduction

1.1 Background

The OSPAR Convention is an international environmental accord regarding protection of the marine environment in the north-east Atlantic that is legally binding under international law. The objective of the Convention is to prevent and eliminate pollution in the maritime areas covered by the Convention. The countries that have ratified the Convention have agreed to implement all measures that will protect the maritime area and ensure that their national policies are in keeping with the provisions laid down in the OSPAR Convention.

The OSPAR Convention is based on a revision and merger of the Oslo Convention from 1972 and the Paris Convention from 1974.[2] Norway was bound under international law to observe these former conventions. The OSPAR Convention was signed in 1992 by the Ministers of the Environment from 15 nations[3]. Parliamentary consent to ratify the OSPAR Convention was given in the Storting's treatment of Proposition no. 39 (1994–95) to the Storting.[4] The Convention was ratified by Norway in 1995 and came into force in 1998.

The supreme decision-making body of the collaboration is the OSPAR Commission, which is made up of representatives for each nation that has signed the Convention. The Commission usually meets once a year. At the meeting of the Commission, binding decisions are passed that the Contracting Parties are obligated to implement, unless they have reserved themselves against the particular decision. The rules for reservation against decisions are laid out in article 13 of the Convention. There are two committees beneath the Commission: the Programme and Measures Committee (PRAM) and the Environmental Assessment and Monitoring Committee (ASMO). Each of these committees has subordinate working groups. The working groups under the Programme and Measures Committee propose measures to combat various forms of pollution (for example, nutrient enrichment and hazardous substances), while the work-

2 Cf. Proposition no. 99 (1971–72) to the Storting for the prevention of marine pollution by dumping from ships and aircraft and Proposition no. 80 (1976–77) to the Storting regarding the prevention of marine pollution from land-based sources.

3 The following countries have signed the Convention and participate in the OSPAR collaboration: Belgium, Denmark, Finland, France, Germany, Great Britain, Iceland, Ireland, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden and Switzerland. In addition, the EU Commission is party to the OSPAR Convention.

4 Cf. Recommendation no. 163 (1994–95) to the Storting and Stortingstidende (the official report of the proceedings) 1994–95, p. 3610 and p. 3629.

ing groups under the Environmental Assessment and Monitoring Committee concentrate on monitoring pollution.

1.2 Objectives and research questions

The objective of this audit was to assess how Norway implements the provisions of the OSPAR Convention, and whether the government administration's use of policy instruments ensures satisfactory compliance with the OSPAR Convention with regard to run-off of nutrients and hazardous substances from land-based sources.

The following problems were analysed:

***Systems**: To what extent has the government administration established systems to promote compliance with the OSPAR Convention?*

- In this connection, attention was focused on the distribution of responsibility and the systems for monitoring, sanctions and reporting.

***Actual compliance**: How is the actual compliance with the provisions of the OSPAR Convention?*

- What objectives have been set for industry, waste water management and agriculture?
- Is the choice of measures and policy instruments appropriate to ensure compliance with the OSPAR Convention?
- To what extent are inspections and sanctions used against polluters?
- To what extent do the different systems for reporting contribute to regulated central control and monitoring?

1.3 Delimitations

The audit was delimited to the provisions laid down in the *general part* of the Convention and the provisions concerning pollution from *land-based sources*. The OSPAR Commission's ongoing resolutions in the form of decisions and recommendations were not investigated.

In this audit, the auditors studied the degree to which the obligations laid down in the Convention have been implemented in industry, waste water management and agriculture. In each of these sectors, the focus was on environmental problems related to run-off of nutrients and hazardous substances. In industry and the waste water treatment sector, the audit area was further delimited to the licensing system in the Pollution Control Act and the internal control regulations and the regulations concerning sepa-

rate waste water treatment plants. In the agricultural sector, it was delimited to the Land Act and the Act relating to pesticides and appurtenant regulations. Performance was charted for the period 1995 to 1998.

The provisions in the OSPAR Convention cover a broad spectrum. This means that there will be cases where measures that are necessary to comply with the OSPAR Convention will also satisfy requirements in *other* international agreements. For example, there is a good deal of overlapping with the North Sea Declarations, which will be mentioned in cases where this is relevant for compliance with the OSPAR Convention. Norway had already established a number of systems and policy instruments *before* the OSPAR Convention came into force. These systems were reviewed in cases where they were of significance to Norway's compliance with the OSPAR Convention.

1.4 Distribution of responsibility

The Ministry of the Environment stated that it has the *overall* responsibility for compliance with the OSPAR Convention. In Norway, the OSPAR Convention is to be implemented by all the sectors involved. According to the Ministry, the principle of sectoral responsibility for implementation of environmental policy does not entail any conflicts or special challenges in this context. The Ministry pointed out that Norway is obligated under international law to implement all the resolutions passed by the OSPAR Commission as legally binding decisions and to harmonise national environmental policy with the objectives of the Convention.

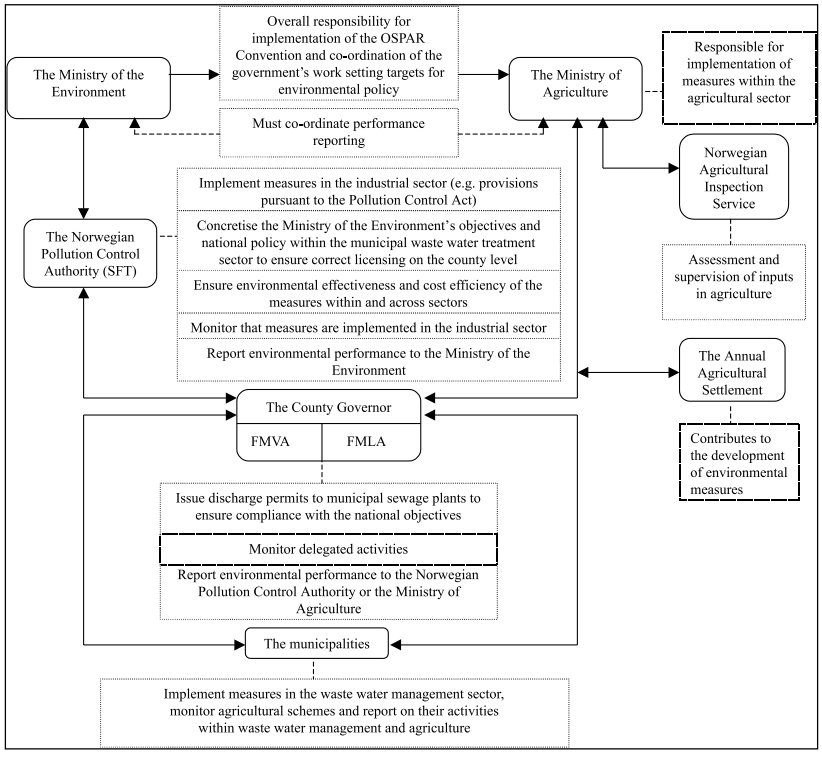
No special systems have been developed to ensure national compliance with the OSPAR Convention in any of the three sectors. Compliance with the provisions in the Convention is based on the established systems of distribution of responsibility and solution of tasks in connection with environmental policy in the sectors.

The Ministry of the Environment and the Norwegian Pollution Control Authority

The Ministry of the Environment is the supreme ministerial department in the industrial sector and the waste water treatment sector. The Norwegian Pollution Control Authority (SFT), is subordinate to the Ministry of the Environment and is responsible for the practical implementation of environmental policy within these two sectors. The Norwegian Pollution Control Authority is responsible for setting the conditions that are necessary to implement the measures in connection with the OSPAR Conven-

tion and is also charged with preparing measures. In addition, the Norwegian Pollution Control Authority is responsible for the implementation of measures in connection with which it has been delegated authority; for example, individual decisions made pursuant to the Pollution Control Act. In a letter to the Office of the Auditor General, the Ministry of the Environment stated that the Norwegian Pollution Control Authority is responsible for ensuring and monitoring that measures are implemented in large industrial companies. In an interview in connection with the audit, the Norwegian Pollution Control Authority stated that one of its tasks was quality assurance of the measures that are to be introduced, by means of assessing the cost effectiveness of the schemes.

The various environmental protection authorities have been ascribed responsibility for providing suitable systems for monitoring the state of the natural environment and for collaborating with the sector authorities with regard to the reporting of results.[5]



FMVA = The Department of Environmental Affairs
FMLA = The Department of Agriculture

Figure 1 Distribution of responsibility between the sector authorities on different levels

5 Report no. 58 (1996–97) to the Storting *Environmental Policy for a Sustainable Development.*

The Ministry of Agriculture

The Ministry of Agriculture is responsible for the implementation of measures in the agricultural sector in accordance with the decisions in the OSPAR Convention. According to the Ministry of the Environment, schemes can be initiated under the provisions of the Act relating to pesticides, the Land Act and by means of the Agricultural Agreement.[6] The Ministry of Agriculture is responsible for environmental policy instruments within the agricultural sector.

The Norwegian Agricultural Inspection Service

The Norwegian Agricultural Inspection Service is a directorate under the Ministry of Agriculture that monitors that the inputs[7] used in agriculture do not cause harm to human health, animals, plants or the environment in either the short or the long term and that they have optimal utility value. The Norwegian Agricultural Inspection Service's responsibilities include work to keep health and environmental risks entailed by the use of pesticides at an acceptably low level. The Norwegian Agricultural Inspection Service approves pesticides for use in Norway and in this context, increasing importance is being attached to the products' environmental properties. In connection with the assessment of pesticides, the Norwegian Agricultural Inspection Service attaches particular importance to the risk of pollution of the groundwater and surface water.[8]

The Annual Agricultural Settlement

According to the Ministry of Agriculture, many of its general responsibilities related to control and monitoring are focused on measures that are linked to the Agricultural Agreement and other schemes that are administered by the Ministry. The environmental targets for many of the schemes are decided in the annual negotiations in connection with the Agricultural Agreement. The Ministry of Agriculture describes the Annual Agricultural Settlement as *"absolutely decisive"* and *"the main arena"* for the design of environmental measures in agriculture today.

The county governors and the municipalities

The County Governors Departments of Environmental Affairs are subordinate to the central environmental protection authorities (the Norwegian Pollution Control Authority) and play a key role in the day-to-day moni-

6 Letter from the Ministry of the Environment to the Office of the Auditor General dated 22 March 1999.
7 Inputs include all kinds of pesticides and artificial fertilisers.
8 Proposition no. 1 (1998–99), to the Storting the Ministry of Agriculture's budget proposition.

toring of the municipalities' and sectors' efforts to avoid pollution. For example, national environmental targets must be communicated to the local and regional levels of government, and the central government interests in the area of environmental protection must be documented and presented. The County Governors Departments of Environmental Affairs have been charged with tasks related to implementation of measures and schemes in industry and the waste water management sector. The County Governors Departments of Environmental Affairs are also the pollution licensing authority for and perform monitoring and inspections in small industrial companies. The county authorities also set requirements regarding removal of pollutants from municipal waste water and monitor and inspect the municipalities' performance. The County Governors Departments of Agriculture are subordinate to the Ministry of Agriculture. Their tasks include promoting compliance with the national targets in agricultural policy and facilitating effective regional adaptations. The business interests in agriculture must be combined with the interests of nature, culture and the environment in the long term.[9]

The municipalities are responsible for initiating and implementing measures in the waste water treatment sector and shall perform inspections of small waste water treatment plants. The municipalities have also been charged with carrying out monitoring tasks in connection with certain environmental measures in the agricultural sector. The municipalities report to the county governor about their activities in the waste water treatment sector and the agricultural sector.

9 Proposition no. 1 (1998–99), to the Storting the Ministry of Agriculture's budget proposition.

2. Methodological approach

The research questions were studied by means of document analysis[10], questionnaire surveys and interviews.

2.1 Document analysis

Much of the audit consisted of charting and assessing the text of the Convention, a variety of Storting documents, Acts of law, regulations, rules and policy documents. The audit criteria were derived from these sources.

The document analysis performed in connection with the audit also included a review of a number of reports and documents produced by the government administration. In addition, the auditors reviewed the performance reports on the environmental results achieved and evaluations of statistical data and qualitative assessments of the environmental measures that have been implemented.

The reports from the government administration about monitoring activities performed by external agents and the information about the implementation of environmental measures in the waste water treatment sector were based on insufficient data. One of the problems was the low reporting percentage from the county governors to the Norwegian Pollution Control Authority for the years 1995 and 1996. For these two years, only a little over two-thirds of the county governors reported to the Norwegian Pollution Control Authority. However, there are no grounds to suspect misrepresentative reporting, and it is therefore reasonable to believe that the *percentages* of violations for these years express the general tendencies.

In the report, the cost of implementing measures is given in current *krone* (NOK) value.

2.2 Interviews

Interviews were carried out with the central authorities for industry, waste water management and agriculture. Executive officers from the

[10] For a complete list of references, please see Appendix 1 to this report: List of documents.

Norwegian Pollution Control Authority and the Ministry of Agriculture were interviewed in June 1999, and executive officers from the Ministry of the Environment were interviewed in November 1999. The purpose of the interviews was to obtain information about compliance with the provisions of the OSPAR Convention in the three sectors and to gain a better understanding of the field. The transcripts from the interviews were verified by the agencies concerned.

2.3 Questionnaire surveys

Questionnaire surveys were undertaken of the Ministry of the Environment, the county governors and the municipalities.

In this report, the findings from the questionnaire sent to the Ministry of the Environment are referred to as "the letter from the Ministry of the Environment".[11] The purpose of this means of gathering data was to ascertain the connections between the OSPAR Convention and the Norwegian schemes and policy instruments that are intended to ensure compliance with the Convention. The structure of the questionnaire was based on the general obligations laid down in the OSPAR Convention and the provisions concerning pollution from land-based sources. The questionnaire had open response categories. These data were then processed to chart the systems and routines that are intended to ensure Norway's compliance with the OSPAR Convention, with special focus on the responsibility for implementation, effectiveness, cost-effectiveness, monitoring and reporting.

The questionnaire surveys that were sent to all the county governors and all the municipalities were performed in November and December 1999. The aim was to chart and assess the *general compliance* with the Convention without regional or local variations distorting the overall picture. The data obtained from the county departments and the municipalities has therefore been presented as data for the whole country. Both the questionnaires had closed multiple-choice response categories that had been tested in advance. The questionnaire sent to the county governors also allowed the respondents to add explanatory comments. Responses were received from 375 municipalities, which equals a response rate of 86 %. All of the (18) county authorities completed the questionnaire.

The purpose of gathering data from the county governors and the munici-

11 The questionnaire was answered in the letter dated 22 March 1999.

palities was to ascertain how the regional and local pollution control authorities *fulfil their responsibilities* with regard to administering the measures and instruments that have been chosen to ensure Norway's compliance with the OSPAR Convention. The questionnaire sent to the municipalities focused on the waste water treatment sector, but also provided an overview of the municipalities' performance of the tasks with which they had been charged in the agricultural sector. The questionnaire sent to the county governors covered all three sectors and also contained a general section on how the county dealt with tasks related to water pollution.

There was a high non-response rate for some of the questions to the county governors and the municipalities. The reason for this is that these questions had been preceded by a question to filter out certain groups, as not all the circumstances covered in the questionnaires were relevant to all the respondents. In order to avoid the non-response rate for certain questions affecting the overall picture, valid percentages and figures have been calculated. The representation in this report therefore provides a true expression of the distribution among the parties that responded to any particular question, i.e. the actual population for the matter concerned.

3. Audit criteria

The audit criteria will be presented in three stages. First, we will discuss the provisions that ensue from Norway's ratification of the OSPAR Convention.[12] These audit criteria were derived from the general obligations pursuant to the Convention and Annex I, which regulates pollution from land-based sources.[13] The second part of this chapter studies Norwegian Acts of law and regulations that govern environmental policy in the three sectors and the environmental targets for nutrient enrichment and hazardous substances. A key goal here was to clarify the degree to which the provisions in the OSPAR Convention are incorporated in Norwegian legislation and regulations. The third part covers guidelines for reporting and management.

3.1 The OSPAR Convention

3.1.1 General obligations

The *purpose* of the OSPAR Convention is that the Contracting Parties shall, in accordance with the provisions of the Convention, take all possible steps to prevent and eliminate pollution.[14] To achieve this objective, the Contracting parties shall implement the necessary measures to protect the maritime area[15] against the adverse effects of human activities. To this end, the Contracting Parties shall, individually and jointly, adopt programmes and measures and shall harmonise their policies and strategies.

12 Cf. Proposition no. 39 (1994–95) to the Storting *Consent to ratification of Convention for the Protection of the Marine Environment of the North-East Atlantic.*

13 Cf. the delimitations in section 1.3 above.

14 Cf. Article 2.1 of the OSPAR Convention.

15 "Maritime area" means the internal waters and the territorial seas of the Contracting Parties, the sea beyond and adjacent to the territorial sea under the jurisdiction of the coastal state to the extent recognised by international law, and the high seas, including the bed of all those waters and its subsoil, situated within the following limits: those parts of the Atlantic and Arctic Oceans and their dependent seas which lie north of 36˚ north latitude and between 42˚ west longitude and 51˚ east longitude, but excluding, the Baltic Sea and the Belts lying to the south and east of lines drawn from Hasenore Head to Gniben Point, from Korshage to Spodsbjerg and from Gilbjerg Head to Kullen, the Mediterranean Sea and its dependent seas as far as the point of intersection of the parallel of 36˚ north latitude and the meridian of 5˚ 36' west longitude. The maritime area as defined in the Convention also includes that part of the Atlantic Ocean north of 59˚ north latitude and between 44˚ west longitude and 42˚ west longitude (Article 1 of the OSPAR Convention).

Figure 2 Map of the “maritime area” as defined in the OSPAR Convention
Source: http://www.ospar.org/eng/html/areamap.htm

The OSPAR Convention contains the following general obligations that are to form the basis for compliance with the objectives of the Convention:

The precautionary principle

The precautionary principle means that preventive measures are to be taken when there are reasonable grounds for concern that substances or energy introduced, directly or indirectly, into the marine environment may bring about hazards to human health, harm living resources and marine ecosystems, damage amenities or interfere with other legitimate uses of the sea, even when there is no conclusive evidence of a causal relationship between the inputs and the effects.[16]

The polluter pays principle

The polluter pays principle entails that the costs of pollution prevention, control and reduction measures are to be borne by the polluter.[17]

16 Cf. Article 2, paragraph 2 a) of the OSPAR Convention.
17 Cf. Article 2, paragraph 2 b) of the OSPAR Convention.

Best available techniques (BAT) and best environmental practice (BEP)

In implementing the Convention, Contracting Parties shall adopt programmes and measures which contain, where appropriate, time-limits for their completion and which take full account of the use of the latest technological developments and practices designed to prevent and eliminate pollution fully. In selecting programmes and measures, the Contracting parties shall define the application of "best available techniques"[18] and "best environmental practice".[19]

"Best available techniques" is defined as "*[…] the latest stage of development (state of the art) of processes, of facilities or of methods of operation which indicate the practical suitability of a particular measure for limiting discharges, emissions and waste*". In determining whether a set of processes, facilities and methods of operation constitute the best available techniques in general or individual cases, special consideration shall be given to comparable processes, technological advances, the economic feasibility of such techniques, time limits and the nature and volume of the discharges and emissions concerned.[20]

Similarly, in the Convention, "best environmental practice" is defined as "*[…] the application of the most appropriate combination of environmental control measures and strategies*". In determining what constitutes the "best environmental practice" in concrete cases, the countries should attach importance to the provision of information and education to the public and to users about the environmental consequences of choice of particular activities and choice of products, their use and ultimate disposal. Furthermore, the countries should also consider the application of economic instruments to activities, products or groups of products.[21]

Best available techniques and best environmental practice will change with time. For example, there may be changes in scientific knowledge or new economic or social factors that necessitate a reassessment of what constitutes best available techniques and best environmental practice. If the reduction of inputs resulting from the use of best available techniques

18 The original English version of the OSPAR Convention uses the term "best available techniques" (BAT), whereas in the Norwegian version that was presented to the Storting, this was translated as "best available technology". This means that in Norwegian, some texts refer to "best available techniques" and others to "best available technology". The original Norwegian version of this audit report consistently used "best available technology"; in this English translation of the audit report, this is consistently rendered "best available techniques".
19 Cf. Article 2, paragraphs 3 a-b) of the OSPAR Convention.
20 Cf. Appendix 1 to the Convention, paragraph 2.
21 Cf. Appendix 1 to the Convention, paragraph 6.

and best environmental practice does not lead to environmentally acceptable results, additional measures have to be applied and best environmental practice redefined.[22]

3.1.2 Point source discharges and diffuse source discharges from land-based sources

The Contracting Parties shall take, individually and jointly, all possible steps to prevent and eliminate pollution from land-based sources in accordance with the provisions of the Convention.[23] Land-based sources are defined as "*[…] point and diffuse sources on land from which substances or energy reach the maritime area by water, through the air, or directly from the coast. It includes sources associated with any deliberate disposal under the sea-bed made accessible from land by tunnel, pipeline or other means and sources associated with man-made structures placed, in the maritime area under the jurisdiction of a Contracting Party, other than for the purpose of offshore activities.*"[24]

When adopting programmes and measures for the purpose of this Annex, the Contracting Parties shall require, either individually or jointly, the use of best available techniques for point sources and best environmental practice for point and diffuse sources, including, where appropriate, clean technology.[25] The Convention also lays down that the Contracting Parties shall take preventive measures to minimise the risk of pollution caused by accidents.[26]

3.1.2.1 Systems for discharge permits and monitoring

The Convention requires that the authorities in each country have a system for setting limits for discharges and a system for monitoring that the conditions in the discharge permits are observed. The Convention prescribes that point source discharges shall be strictly subject to authorisation or regulation by the competent authorities of the Contracting Parties. Such authorisation or regulation shall, in particular, implement relevant decisions of the Commission, which bind the relevant Contracting Party.[27] It is also stated that the Contracting Parties shall provide for a system of

22 Cf. Appendix 1 to the Convention, paragraphs 3 and 8. *Environmental Policy for a Sustainable Development.*
23 Article 3 of the OSPAR Convention.
24 Article 1, e) of the OSPAR Convention
25 Annex I to the Convention, Article 1, paragraph 1.
26 Annex I to the Convention, Article 1, paragraph 3.
27 Annex I to the Convention, Article 2, paragraph 1.

regular monitoring and inspection by their competent authorities to assess compliance with authorisations and regulations.[28]

3.2 The OSPAR Convention and Norwegian legislation and regulations

In this section, we will discuss where the general obligations of the Convention and the specific provisions concerning discharges from land-based sources are covered in Norwegian legislation and regulations. In a letter to the Office of the Auditor General, the Ministry of the Environment stated that these aspects of the OSPAR Convention are catered for in *the Pollution Control Act, the Act relating to pesticides* and *the Land Act*.[29] Further, the Ministry of the Environment stated that a number of *regulations* have been formulated pursuant to these Acts, which promote compliance with the targets laid down under the OSPAR Convention even though they were not passed with the specific intention of implementing OSPAR decisions. The Ministry pointed out that as a result of the North Sea Declarations regarding the reduction of discharges of hazardous substances and nutrients and the EEA Agreement, several policy instruments have been approved that also contribute to compliance with the OSPAR Convention.

3.2.1 The provisions of the Pollution Control Act pertaining to technology and the polluter pays principle

Requirements regarding technology

The Pollution Control Act lays down a number of provisions regarding technology. The Act states that efforts to avoid and limit pollution and waste problems shall be based on the technology that will give the best results in the light of an overall evaluation of current and future use of the environment and economic considerations.[30]

The phrase in the OSPAR Convention that what constitutes "best available techniques" may change with time is met by Section 18 of the Pollution Control Act. This Section provides that the pollution control authority may alter the conditions attached to discharge permits, for example, if new technology makes substantial reduction of the pollution

28 Annex I to the Convention, Article 2, paragraph 2.
29 The Ministry also stated that the provisions in the OSPAR Convention are implemented in the Seaworthiness Act, the Act pertaining to Petroleum Activities and the Product Control Act, but these Acts have not been included in this audit.
30 Section 2, sub-section 3, of the Pollution Control Act.

possible. Changes of this nature may be made regardless of whether they are to the advantage or disadvantage of the polluter.

The polluter pays principle

The polluter pays principle is covered by Section 2 of the Pollution Control Act, which states that the costs of preventing or limiting pollution and waste problems shall be met by the person responsible for the pollution or waste.

3.2.2 The provisions of the Pollution Control Act pertaining to point source discharges

The purpose of the Pollution Control Act is as follows: "*The Act shall ensure that the quality of the environment is satisfactory, so that pollution and waste do not result in damage to human health or adversely affect welfare, or damage the productivity of the natural environment and its capacity for self-renewal*".[31] The Act also lays down a duty to avoid pollution. It is stated that no person may possess, do or initiate anything that may entail a risk of pollution unless this is lawful pursuant to Section 8, which contains a number of limitations on this duty.[32] One such limitation is that "*ordinary pollution*" from agriculture, among others, is permitted pursuant to the Pollution Control Act insofar as no special regulations have been issued.

3.2.2.1 Systems for authorisation and regulation of discharges

The OSPAR Convention requires that discharges from point sources shall be subject to authorisation or regulation.[33] The Ministry of the Environment stated that Section 7 of the Pollution Control Act regarding duty to avoid pollution meets this requirement.[34] The licensing system pursuant to the Pollution Control Act is based on a general prohibition for which dispensation may be granted through the issuing of discharge permits.[35] In connection with licensing decisions (usually called discharge permits), conditions may be set "*in order to prevent pollution causing damage or disadvantage*".[36] This entails that discharge limits may be set, orders may be given for the implementation of concrete measures to limit

31 Section 1 of the Pollution Control Act.
32 Section 7 of the Pollution Control Act.
33 Cf. section 1.2 above.
34 Letter from the Ministry of the Environment to the Office of the Auditor General dated 22 March 1999.
35 Section 11, first paragraph, of the Pollution Control Act.
36 Cf. the discussion of the licensing system in NOU 1995:4 *Policy instruments in environmental policy*.

pollution and requirements may be set regarding measures in the receptor.[37]

The Pollution Control Act lays down that if possible, pollution problems shall be solved for larger areas as a whole on the basis of general plans and local development plans.[38]

The duty of the Contracting Parties under the OSPAR Convention to take preventive measures to minimise the risk of pollution caused by accidents[39] is covered by the *duty to have an emergency response system* in the Pollution Control Act that applies to persons engaged in any activity which may result in acute pollution.[40] The emergency response system must be adequate to prevent, detect, stop, remove and limit the impact of the pollution. The pollution control authority may by regulations or individual decision lay down that contingency plans shall be submitted for approval for any activity that may result in acute pollution.[41] The responsibility for the emergency response system to deal with acute pollution was discussed in more detail in the Fiscal Budget for 1999, where a target is set that by the year 2000 there shall at all times be an adequate level of emergency preparedness in relation to the risk of acute pollution. Pursuant to the Pollution Control Act, the municipalities are responsible for provision of an adequate emergency response system for acute pollution.[42]

3.2.2.2 The monitoring system in industry and the waste water treatment sector

The Ministry of the Environment stated that the requirement in the OSPAR Convention regarding the establishment of a system for regular monitoring and inspection to assess compliance with authorisations and regulations is met through the Norwegian Pollution Control Authority's monitoring and inspection activities. The Norwegian Pollution Control Authority's monitoring activities include checking the pollution reports

37 A receptor is an entity in the natural environment that receives emissions of pollutants. The main categories of receptor are air, soil and water. A receptor may have natural boundaries, such as, for example, a lake, a river, an area of land, the air space over a city, etc. This report is focused on water as a receptor of pollution. All receptors have a certain normal state, which is characterised by particular forms of plant and animal life that constitute the receptor's ecosystem. The condition of the receptor can be described using a number of quantifiable factors, such as the quantity of fish living in the water, the pH value of the water, etc. (Source: Ascehoug og Gyldendahls *Store norske leksikon*; Førsund and Strøm: *Miljø og ressursøkonomi* [Universitetsforlaget, 1980]).

38 Section 11, third paragraph, of the Pollution Control Act.

39 Annex I to the OSPAR Convention, Article 1, paragraph 3.

40 Section 40 of the Pollution Control Act.

41 Section 41 of the Pollution Control Act.

42 Proposition no. 1 (1998–99) to the Storting, the Ministry of the Environment's budget proposition.

submitted by companies and inspections and audits performed in accordance with predefined criteria and plans. The various sanctions available are warranted by Section 73 of the Pollution Control Act.[43] Under the provisions of this Section, the pollution control authority may impose pollution fines either until the conditions have been fulfilled or as a fixed amount to be paid for each contravention.

A pollution fine may be imposed when contravention of the Act or decisions pursuant thereto is discovered. The pollution fine is imposed on the person responsible for the contravention.[44] If the regulatory authority believes that an enterprise has failed to comply with the provisions governing emissions, contingency plans, orders, etc., the regulatory authority is entitled to report the matter to the police. Section 78 of the Pollution Control Act lays down detailed provisions regarding the circumstances that entail criminal liability for pollution.

Special rules governing waste water treatment facilities etc.

The Pollution Control Act defines waste water treatment installations as installations for the transport and treatment of waste water.[45] The *municipality* is responsible for the operation and maintenance of waste water treatment installations that are wholly or partly owned by the municipality. In the case of *private* waste water treatment installations, the owner of the property for which the installation was originally built is responsible for operation and maintenance of the facility.[46]

Regulation concerning emissions from separate (private) waste water treatment systems

The regulation concerning emissions from separate (private) waste water treatment systems is founded on the Pollution Control Act and applies to minor emissions of waste water from buildings that are not connected to the municipal sewage system and which must instead be connected to a separate waste water treatment plant. The municipality processes applications for discharge permits for separate waste water treatment facilities. The regulation also lays down that decisions must be based on the interests of the users, and that the natural state of the receptor of the waste water shall not be affected significantly. The municipality is responsible for monitoring these kinds of installations and must approve them before

43 Letter from the Ministry of the Environment to the Office of the Auditor General dated 22 March 1999.
44 Section 73 of the Pollution Control Act.
45 Section 21 of the Pollution Control Act.
46 Section 24 of the Pollution Control Act.

they can be used. The municipality shall also undertake periodic inspections of separate waste water treatment systems in use.

The owner of the separate waste water treatment system is responsible for ensuring that the installation is operated and maintained in accordance with the conditions laid down in the discharge permit. Pursuant to Sections 48 to 51 of the Pollution Control Act, the municipality is authorised to perform inspections to ascertain that the regulations are being complied with and to make individual decisions in accordance with the provisions in the regulation. The same rules also apply to the municipalities' authority to issue orders to change or cease legal discharges pursuant to Section 18 of the Pollution Control Act, in cases where the municipality issued the original discharge permit.

The municipality, or the party authorised by the Ministry of the Environment, is entitled to issue pollution fines pursuant to Section 73 of the Pollution Control Act. Chapter 10 of the Pollution Control Act on penal measures shall be applied in the event of contravention of the regulation or decisions made pursuant to the regulation.

The internal control regulations

The Ministry of the Environment stated that the OSPAR Convention's requirement for preventive measures to reduce the risk of accidents is met through the internal control system.[47] The internal control regulations are founded on the Pollution Control Act and lay down the obligation to maintain internal control.[48] Section 1 of the regulations states that one of the objectives of the regulations is to promote efforts to improve conditions in enterprises in regard to protection of the external environment against pollution and improved treatment of waste so as to ensure that the objectives of the health, environmental and safety legislation are achieved. To this end, plans and measures shall be drawn up to reduce risks. The enterprises are also obligated to implement routines to detect, rectify and prevent breaches of requirements established in or pursuant the Pollution Control Act and appurtenant regulations. The supervisory authority shall supervise and provide guidance on implementation of and compliance with these regulations. The provisions on penalties and other sanctions set out in the Pollution Control Act are applicable in the event of contravention of the provisions in these regulations.

47 Letter from the Ministry of the Environment to the Office of the Auditor General dated 22 March 1999.
48 The Internal Control Regulations (Regulation no. 1127 of 6 June 1996).

The Norwegian Pollution Control Authority and the Directorate for Nature Management collaborated on the development of the *Guidelines for the county governors' activities in connection with environmental issues* (the "Basis Document"), which came into force on 1 January 1997. Here it is stated that the monitoring and inspection activities of the *County Governors Department of Environmental Affairs* (FMVA) must be focused on ascertaining systematic target orientation and the use of the internal control system. It is the County Governors Department of Environmental Affairs' task to ensure that the municipalities submit documentation of sufficient quality. It is also stated that the supervisory authorities shall encourage the quick development and implementation of internal control systems in the enterprises under their jurisdiction and shall increasingly base their supervision on system audits and verification. The guidelines also draw the County Governors Departments of Environmental Affairs' attention to the dual role played by the municipalities – on the one hand, the municipalities are polluters and therefore are responsible for the operation of waste water treatment plants; on the other hand, they have been entrusted with responsibilities as the exerciser of government authority. As the exerciser of government authority in the waste water treatment sector, the municipalities have been charged with a number of supervisory tasks, for example, in connection with separate installations not owned by the municipality. The purpose of the internal control regulations in respect of the external environment is to regulate polluting activities; monitoring pursuant to the regulations must therefore be aimed at the municipality as a polluter. It is laid down that all municipalities are to have established an internal control system for the external environment by 31 December 1995 at the latest. The Basis Document also underlines that it is important that the County Governors Departments of Environmental Affairs use the policy instruments afforded to them by the Pollution Control Act to ensure that all polluting enterprises in the county, and especially municipal enterprises, comply with the requirements.

3.2.3 The provisions of the Land Act pertaining to diffuse source discharges

3.2.3.1 The monitoring system in the agricultural sector

The Ministry of the Environment stated that in Norway a system has been developed for regular *monitoring and inspection* in order to assess compliance with authorisations and regulations of releases into water or air in the agricultural sector in keeping with the requirement in the OSPAR Convention. The Norwegian system of monitoring and inspection is based

on the county governors' and the municipalities' supervision pursuant to various Acts of law and regulations.[49]

One of the objectives of *the Land Act* of 12 May 1995 is that land resource management shall be environmentally sound and, among other things, take into consideration protection of the soil as a production factor. To this end, the Land Act provides that the Ministry of Agriculture may issue provisions regarding cultivation that aim at preventing erosion and regulating the use and storage of fertilisers and other inputs in the production process.

A coercive charge may be determined when contraventions of the Act itself or of decisions pursuant to the Act are discovered. The Land Act also provides that a coercive charge may be determined in advance and shall increase as long as the offence continues, or that it shall be payable for each contravention. Some of the measures that are intended to ensure compliance with the provisions of the OSPAR Convention in the agricultural sector have been formulated as regulations founded on the Land Act. Five of these regulations lay down a variety of measures all of which are intended to help reduce diffuse source discharges of nutrients from agriculture.

Regulation no. 558 of 22 May 1998 relating to the investment grant for environmental measures

The objective of this regulation is to protect agricultural areas, to prevent erosion, run-off of nutrients and pollution from agriculture and to increase the natural green infrastructure in rural areas by awarding an investment grant for implementation of environmental measures. This grant provides support for a variety of measures – individual schemes and joint measures – and covers technical environmental measures, planting schemes and ecological pollution abatement measures. The county governor monitors projects that are awarded funds under this grant scheme and may order that additional work or improvements be undertaken if this is necessary to ensure that the measures have the intended effect. The county governor may also demand that the grant funds or investment loan be repaid, in part or in full, if circumstances are discovered that are in breach of the conditions on which the support was granted.

Regulation no. 671 of 19 June 1998 relating to the grant for alternative tilling and cultivation methods etc.

The objective of this grant scheme is to stop farmers ploughing in the autumn and to stimulate the sowing of permanent vegetation in order to

[49] Letter from the Ministry of the Environment to the Office of the Auditor General dated 22 March 1999.

reduce erosion and run-off from agricultural land. This grant is intended primarily for areas that have a high risk of pollution. The municipalities assign priorities between applications and make recommendations to the county governor about payments. Before funds are paid out under this scheme, the municipality must perform a number of checks in accordance with guidelines issued by the Norwegian Grain Corporation. The county governor shall ascertain that the necessary inspections have been performed and may demand repayment of the entire subsidy if the conditions for the grant are not fulfilled. In connection with the grant for alternative tilling and cultivation methods, spot checks shall be performed on at least 20 % of the applicants.[50]

Regulation no. 1093 of 26 November 1998 relating to livestock manure

The manure regulations are founded on the Land Act and the Pollution Control Act. The objective of these regulations is to ensure that optimal use is made of livestock manure as a resource in the crop production process and to prevent water pollution from manure. New manure storage facilities must be inspected and approved by the county governor before they can be used. In certain cases, the county governor may issue an order to implement any measures that are deemed to be necessary to prevent, limit or stop pollution that is in contravention of the regulations. If there is insufficient spreading area, the county governor shall pass a decision concerning a deduction in the agricultural production subsidy. The size of the deduction is determined by the Ministry of Agriculture. In the event of contravention of these regulations or decisions passed pursuant thereto, the county governor or the party authorised by the Ministry of the Environment, may impose pollution fines payable to the central government in accordance with Section 73 of the Pollution Control Act.

Regulation no. 1213 of 18 August 1995 relating to fertiliser plans

The objective of this regulation is to provide grounds for a qualitatively good crop and to minimise releases of nutrients to water and the air from agricultural areas. This objective is to be achieved by means of the users preparing a plan for the various different types of fertiliser they intend to apply, i.e. mineral fertilisers, manure, slurry and other organic and inorganic fertilisers. The regulations apply to all agricultural properties that are entitled to production support, cf. the general regulations relating to agricultural production support. The local municipality is responsible for monitoring that fertiliser application plans have been prepared and that

50 Letter from the Ministry of Agriculture to the Office of the Auditor General dated 3 September 1999.

they satisfy the requirements laid down in the regulations. Applicants for the agricultural production subsidy have a duty to provide all the necessary particulars and to accept any control and monitoring measures that are implemented. If the conditions in the regulations are not observed, funds may be deducted from the agricultural production subsidy.

Regulation no. 1465 of 4 December 1996 relating to the grant for environmental improvements in cereal-growing areas

The main objective of this regulation was to reduce erosion from cereal-growing areas that have a high erosion risk. A secondary objective was to provide means for farmers to test and develop environmentally sound and extensive plant production in areas with a high erosion risk that are currently being used to cultivate cereals or other crops in open fields. The county governor was to supervise and monitor the schemes that received conversion support and ensure that the conditions laid down in the regulations and contracts had been met before the annual acreage payments were paid out. This grant could be demanded to be repaid in full or in part, if circumstances were discovered that were in breach of the requirements for the support. The county governor was entitled to issue orders to perform any extra work and improvements necessary to ensure the scheme was satisfactory. The requirement for reimbursement from the county governor was intended to be aimed at users that had received the grant. This regulation was in force from 1 January 1996 to 31 December 1999.

3.2.4 The provisions of the Act relating to pesticides pertaining to diffuse source discharges

The Act relating to pesticides etc. of 5 April 1963 applies to pesticides and substances and preparations (chemical products) for a variety of purposes.[51] The Ministry of Agriculture may delegate the responsibility for monitoring compliance with the Act and appurtenant regulations to other agencies. The Ministry may issue detailed regulations concerning monitoring and inspection. Any person who wilfully or through negligence contravenes the Act or regulations issued pursuant to the Act is punishable with fines. Complicity in a contravention is subject to the same penalties.[52]

51 Cf. Section 1 of the Act relating to pesticides.
52 Section 18 of the Act relating to pesticides.

Regulation no. 166 of 23 February 1999 relating to pesticides

All pesticides must be approved by the Norwegian Agricultural Inspection Service. Any party that produces, imports or trades pesticides must register all the information that the Norwegian Agricultural Inspection Service deems necessary to ensure effective monitoring. The Norwegian Agricultural Inspection Service and the Customs and Excise Administration monitor compliance with the regulations. Contravention of the regulations may result in revocation of the licence and is punishable with fines.

3.2.5 Environmental targets

Nutrient enrichment

As far as possible, the selection of measures shall be based on their having the greatest environmental impact and incurring the least costs in reducing pollution. This means that the most effective measures must always be chosen regardless of the traditional boundaries between sectors.[53]

The national targets for reduction of discharges of nutrients have been changed in recent years. Originally, the run-off of nutrients to vulnerable parts of the North Sea was to be halved in the period 1985 to 1995.[54]

The target of halving the run-off of nutrients has subsequently been discussed and concretised in more detail in the annual budget propositions submitted by the Ministry of the Environment. In the budget proposition for 1997, it was stated that the goal for nutrient enrichment and discharges of organic substances was basically to have renovated the waste water treatment sector by the year 2000.[55] A further target was set that discharges of the nutrients phosphorus and nitrogen to the "vulnerable area" in the North Sea was to be reduced by 50 % *as quickly as possible* based on the 1985 figures. According to the budget proposition, new knowledge about costs and effectiveness has necessitated a new and thorough revision of the analysis of the measures across the sectors.[56] In respect of this

---

53 Report no. 64 (1991–92) to the Storting *Concerning Norway's implementation of the North Sea Declarations*.
54 Report no. 46 (1988-89) to the Storting *Environment and Development*.
55 Proposition no. 1 (1996–97) to the Storting, the Ministry of the Environment's budget proposition
56 This analysis of the measures was published as the Norwegian Pollution Control Authority (SFT)'s report no. 92:14 "The North Sea Declarations – measures to reduce nutrient inputs". All references in this audit report to "the analysis of the measures" refer to this report published by the Norwegian Pollution Control Authority

target, a new *interim sector target* has been set to reduce nutrient run-off based on calculations of cost-effectiveness. The sector figures are quoted in relation to 100 % discharges for each individual sector, whilst the total figures demonstrate the overall reduction targets. The new *interim* sector targets are as follows:

Table 1 Reduction targets for phosphorus and nitrogen in the three sectors

Sector	*Phosphorus*	*Nitrogen*
Agriculture	40 %	44 %
Waste water management	54 %	44 %
Industry	50 %	75 %
Total reductions	50 %	50 %

Source: Proposition no. 1 (1996–97) to the Storting– The Ministry of the Environment's budget proposition.

In the budget proposition for 1999, the time limit for reducing run-off of phosphorus and nitrogen by 50 % in relation to the 1985 figures was extended to 2005. It is also stated that Norway has amended its definition of the vulnerable area for nitrogen. Consequently, new target figures for reductions of nitrogen run-off must be calculated for the three sectors. The sectoral reduction targets for phosphorus have not been changed, according to the budget proposition.[57]

The goals set in the Ministry of Agriculture's budget propositions have not changed significantly in recent years. In the budget proposition for 1998[58], it is stated that the Ministry has set the target of registering and documenting the state of the environment and measures to improve environmental performance with regard to erosion and loss of nutrients, hazardous substances and spread of pesticides[59]. A further goal was to increase knowledge about environmental issues in the government administration and the business community in order to promote a safe and quick

57 Proposition no. 1 (1996–97) to the Storting, the Ministry of the Environment's budget proposition.
58 Proposition no. 1 to the Storting (1997–98), cf. also Proposition no. 1 to the Storting (1998–99) and Proposition no. 1 to the Storting (1999–2000), the Ministry of Agriculture's budget propositions for these years.
59 Pesticides are toxins. They may be produced naturally or artificially by human beings, called natural and synthetic pesticides, respectively. Many plants develop poisonous substances in order to protect themselves against or deter their natural enemies. Researchers do not agree on the significance of natural pesticides. Moreover, there is no clear division between the natural pesticides formed in plants and synthetic pesticides, since many man-made pesticides are copies of naturally occurring substances. However, perhaps the most important factor in connection with assessments of pesticides is the methods and effects of their absorption by the human body.

changeover to more environmentally sound operation in high-priority areas, such as pest and disease control and the use of fertilisers.

Hazardous substances

For the most part, Norway has achieved the quantitive reduction targets that were set in the North Sea Declarations and national decisions for a number of specified hazardous substances. Nevertheless, these reductions are not sufficient. The goal for the work to implement the decisions of the Fourth North Sea Conference held in Esbjerg in 1995 is to ensure a sustainable, sound and healthy ecosystem in the North Sea by applying "the precautionary principle". This goal shall be achieved by "*[…] continuously reducing discharges, emissions and losses of hazardous substances thereby moving towards the target of their cessation within one generation (25 years)*".[60] The ultimate goal is that concentrations of hazardous substances in the environment shall be reduced to levels close to the background values for naturally occurring substances and close to zero for synthetic substances and substances created by human actions.

In the budget proposition for 2000, it is stated that this goal must be further operationalised and that this has been done within the OSPAR collaboration. It is also stated that Norway wishes that ambitious goals be set for this project and that Norway plays a central part in the process under the OSPAR Convention to develop a system to indicate which chemicals shall be included in the objectives. The list of hazardous chemicals is to be completed by the end of 2000. By 2003, the OSPAR Commission shall have determined measures to stop discharges of these chemicals. It is also stated that Norway is responsible for the management of a project to establish a joint reporting system for discharges of chemicals, which can be used for the submission of progress reports to the Fifth North Sea Conference.[61]

The main aim of stopping all emissions of hazardous substances has been broken down into more concrete performance targets. For example, a target has been set that discharges of certain hazardous substances shall be stopped completely or reduced significantly by 2000, 2005 and 2010.[62] It

60 Proposition no. 1(1996–97) to the Storting, Proposition no. 1 (1997–98) to the Storting, Proposition no. 1 (1998–99) to the Storting and Proposition no. 1 (1999–2000) to the Storting, the Ministry of the Environment's annual budget propositions.
61 Proposition no. 1 (1999–2000) to the Storting, the Ministry of the Environment's budget proposition.
62 Cf. the list of priorities, table 3.5.1, p. 144 in Proposition no. 1 (1997–98.

is also stated that the risk of losses and the use of chemicals that are harmful to human health and the environment shall be reduced considerably.[63]

For 1998, the performance requirement was set that the Norwegian Pollution Control Authority shall ensure the reduction of discharges and use of the chemicals on the list of priorities. In consultation with the other Nordic countries, the Norwegian Pollution Control Authority shall establish criteria for defining negative properties as a basis for the cessation of losses of hazardous substances within the OSPAR collaboration. The Norwegian Pollution Control Authority is also responsible for ensuring that the business community complies with the current rules and regulations, for example, by means of increased monitoring and information. It is expected that the Norwegian Pollution Control Authority will draft a plan for the further integration of increased monitoring activities into the work on hazardous chemicals.[64]

Priority areas

The environmental challenges associated with the elimination and prevention of discharges of hazardous substances and nutrients have different geographical priorities. Measures in connection with hazardous substances have the same priority throughout the whole country, whereas measures to reduce discharges of the nutrients phosphorus and nitrogen have different geographical priority according to whether the area drains into the part of the North Sea that has been defined as affected by eutrophication[65]. Nowadays, the area that is adversely affected by eutrophication[66] is defined as the marine area from the Swedish border to Lindesnes (Skagerrak). *Norwegian inputs* of nitrogen have a significant effect on the degree of eutrophication within the area from the Swedish border to Strømstangen lighthouse (Hvaler–Singlefjorden) and in the inner Oslo fjord. Certain fjords that have limited water renewal are also adversely affected by concentrations of phosphorus and nitrogen as a result of discharges from Norwegian sources. In addition, there are certain bodies of fresh water across the whole country that have poor or very

63 Proposition no. 1 (1997–98) to the Storting, Proposition no. 1 (1998–99) to the Storting and Proposition no. 1 (1999–2000) to the Storting , the Ministry of the Environment's annual budget propositions.
64 The Norwegian Pollution Control Authority (SFT)'s annual plan for 1998.
65 Eutrophication means nutrient enrichment, which is the result of large inputs of plant nutrients and particles to water, cf. Report no. 8 (1999–2000) to the Storting *The government's environmental policy and the state of the environment in Norway*, p. 56.
66 Also called "the vulnerable area".

poor water quality. The *outer coastline* from western Norway (Vestlandet) and northwards is not affected by nutrient enrichment.[67]

3.3 Reporting and management

The requirement to report to the OSPAR Commission is laid down in article 22 of the OSPAR Convention. The Ministry of the Environment stated that there are no special routines for the Norwegian Pollution Control Authority's reporting to the Ministry on results in the light of the OSPAR Convention's programmes and measures. The Norwegian Pollution Control Authority is responsible for reporting results directly to the Commission. The Norwegian Pollution Control Authority's reports are included in the OSPAR Commission's annual reports, which are also submitted to the Ministry of the Environment for informational purposes.[68]

Norway's reporting to the OSPAR Commission presupposes that there is a *national system* for reporting in connection with the measures that are implemented. It is this aspect of the reporting that has been investigated in the audit. The Ministry stated that routines have been established on the national level for reporting on emissions once a year for approx. 450 companies that have been granted discharge permits. In the agricultural sector, reports are submitted each year in preparation for the negotiations in connection with the Agricultural Agreement, based on the inspections performed by the county governors and the municipalities. Most of the reporting is to be accomplished through the Norwegian Environmental Monitoring Programme (JOVÅ). With regard to municipal waste water management, the Ministry stated that the municipalities report their performance results to the county governor each year, who in turn reports to the Norwegian Pollution Control Authority via the database SESAM.[69]

The financial management regulation in the central government and appurtenant functional requirements defines more detailed requirements concerning reporting. According to the functional requirements regarding financial management in the central government, the Ministry has the overall responsibility for ensuring that its subordinate agencies observe Acts of law, regulations and instructions and that they have sound internal control routines. Reports must contain all the information that the

67 Report no. 8 (1999–2000) to the Storting *The government's environmental policy and the state of the environment in Norway*.
68 Letter from the Ministry of the Environment to the Office of the Auditor General dated 22 March 1999.
69 Letter from the Ministry of the Environment to the Office of the Auditor General dated 22 March 1999.

Ministry needs to be able to perform its superior management tasks and prepare budget propositions with the necessary reports to the Storting.

The Ministry must also make sure that the agencies' performance of their assignments and use of the instruments available to them are analysed in such a way that it is apparent whether the agencies' activities are fulfilling their objectives. Further, the evaluations that are performed may encompass the whole of or parts of one or several agencies' activities. Evaluations also include grant schemes. The frequency of these evaluations varies according to the importance of the scheme and whether annual reports give grounds to believe that circumstances may have changed. It is stated that the less precise the description of the annual performance results, the more important it is to undertake a thorough evaluation. A responsible ministry may delegate collection and comparison of the necessary information to subordinate bodies, research institutes and other similar organisations.

Monitoring on the county level

The County Governors Department of Environmental Affairs (FMVA) plays an important role in ensuring that the national targets are met. The County Governors Department of Environmental Affairs must have an overview of discharges and run-off of nutrients and organic substances in the county and have an overview of the state of and changes in the bodies of water that are affected by emissions. Requirements set by the county authorities regarding reductions in discharges must be firmly anchored in the national targets and as far as possible be justified on the basis of a combination of local and regional advantages for the receptors. The criterion for implementing any single measure must be that the benefits will be greater than the costs.[70]

With regard to municipal waste water treatment systems, the County Governors Departments of Environmental Affairs shall set environmental requirements and functional requirements rather than requirements regarding the use of specific technical systems. The owner of a waste water treatment facility is responsible for finding satisfactory technical solutions. The authority to issue discharge permits is an important and effective tool in the County Governors Departments of Environmental Affairs' work to set environmental requirements and functional requirements for municipal waste water treatment. It is also stated that the County Governors Departments of Environmental Affairs shall have

70 Guidelines for the county governors' activities in connection with environmental issues (the "Basis Document"), applicable from 1 January 1997.

knowledge of the state of the environment in sparsely populated areas of the county. If discharges of pollutants from sparsely populated areas prevent downstream municipalities from achieving their targets, or if the discharges clearly violate the requirements that have been set for other emissions in the area, the County Governors Department of Environmental Affairs shall indicate to the municipality concerned that measures must be implemented.[71]

During the course of 1998, all the counties in Norway were to have compiled county environmental status reports. These reports will constitute an important tool in the effort to provide central target groups with access to information about the current state of the environment and developments. The goal is to mediate knowledge that will contribute to better understanding and overview of environmental issues nationally and locally within a global perspective. The aim is that county environmental status reports will be published every four or five years.[72]

[71] Guidelines for the county governors' activities in connection with environmental issues (the "Basis Document"), applicable from 1 January 1997.
[72] Guidelines for the county governors' activities in connection with environmental issues (the "Basis Document"), applicable from 1 January 1997.

4. Description of the findings

This chapter contains a description of Norway's practice in its implementation of the OSPAR Convention in industry, waste water management and agriculture. First, there is a presentation of Norway's compliance with the general obligations of the OSPAR Convention. Then there is a review of *each of the three sectors*. To what degree has Norway implemented the measures that are intended to ensure compliance with the provisions of the OSPAR Convention, and how are the available policy instruments being used? Other central questions include ascertaining what is being done to monitor enterprises that pollute and what sanctions are used when violations are discovered. The sections on each of the three sectors describe the use of reporting schemes that are intended to ensure overall management and control. The presentation of the facts is concluded with a description of how the county governors perform their tasks in connection with pollution of water and a presentation of the status of nutrient enrichment and discharges of hazardous substances.

4.1. Compliance with the general obligations of the OSPAR Convention

The Ministry of the Environment's interpretation of the objective of the OSPAR Convention

According to the Ministry of the Environment, the objective of the OSPAR Convention is extremely broad, and it is not the case that the countries that have adopted the Convention "take all possible steps to prevent and eliminate pollution" in practice. The Ministry understands the objective of the Convention to be a *general guideline* and goal, not an absolute requirement.

The Ministry distinguishes between the general obligations in the Convention and obligations on which decisions are based. The Ministry believes there is room for national judgement in the sense that the individual countries can deviate from the general principles insofar as this is necessary, without such deviations being regarded as contravention of the Convention in a legal sense.

The precautionary principle

The precautionary principle, as it is defined in the OSPAR Convention, is not mentioned in the Pollution Control Act, the Land Act or the Act relat-

ing to pesticides. The Ministry of the Environment stated that it is important to distinguish between a general preventive environmental policy and "the precautionary principle". The OSPAR Convention focuses on the preventive element in the precautionary principle, entailing that the formulation in the OSPAR Convention has much in common with what can generally be called preventive environmental policy. However, the core of the precautionary principle is a guideline that preventive measures are to be taken when there are reasonable grounds for concern that substances or energy introduced into the environment may bring about serious environmental hazards, even when there is no conclusive evidence of a causal relationship between the inputs and the effects. In general, then, the precautionary principle falls within the framework of preventive environmental policy, but preventive environmental policy includes much more than the essence of the precautionary principle[73]. In the audit interview, the Ministry pointed out that preventive environmental policy is the starting point for all its measures and was unaware of any concrete measures that were in breach of this principle.

It is generally believed that the risk of damage or harm caused by emissions of hazardous substances is greater than the risks associated with discharges of nutrients. Receptor-oriented policies are employed in connection with nutrients. This means that the requirements for nutrient removal are determined on the basis of the size of inputs that the bodies of water concerned *can tolerate* and on the basis of the cost-effectiveness of the measures.[74] However, for hazardous substances, the Ministry assumes that the sea *cannot tolerate any* hazardous substances and that inputs of hazardous substances must be ceased if possible, or at least reduced significantly. The reasoning behind this is that hazardous substances are dangerous even in small doses and take a very long time to break down in the environment. In other words, emissions of hazardous substances entail the risk of irreversible damage to the environment, whilst emissions of nutrients entail the risk of damage over a limited period of time. Nevertheless, the Ministry stated that there is ongoing debate about the maximum *level* of the nutrient concentration that the sea can tolerate.

According to the Ministry of the Environment, it is difficult to concretise how preventive environmental policies are put into practice in the three sectors industry, waste water management and agriculture. The Ministry of the Environment stated that ideally it would like to go farther in con-

73 Letter from the Ministry of the Environment to the Office of the Auditor General dated 16 May 2000.
74 Letter from the Ministry of the Environment to the Office of the Auditor General dated 22 March 1999.

cretising preventive environmental policy in the three sectors, but that it is necessary to distinguish between ideals and what is practicable.

The polluter pays principle

This principle is laid down in the guidelines in Section 2 of the Pollution Control Act and is a general principle in Norway's national pollution control policy. Norway has not based its environmental policy in the agricultural sector on this principle in full, as the central government grants financial subsidies to minimise the pollution from this sector. However, the Ministry emphasised that money is deducted from the grants given to farmers that do not satisfy the environmental requirements and that, in the Ministry's opinion, deductions of this nature can be regarded as application of the polluter pays principle in the agricultural sector.

Best available techniques (BAT) and best environmental practice (BEP)

The Ministry of the Environment stated that "best available techniques" are an underlying norm for the conditions given in discharge permits. These conditions are set on the basis of the size of emissions that the best available techniques would yield. Nevertheless, individual companies are free to choose another technique as long as it meets the requirements. Companies are never instructed to invest in a particular technological system.

New technology and new techniques are being developed continuously, and it is important to ensure that the new knowledge that is generated is integrated into the ongoing work to prevent and eliminate pollution. According to the Ministry of the Environment, the authorities' requirements to polluting activities are always set in relation to current knowledge, what is available and what is technically and financially possible at the time authorisation is granted. For this reason, requirements to new enterprises may be more stringent than the requirements that apply to older enterprises, and there will be differences between enterprises in the same industry because the licences were granted at different times.

The Ministry of the Environment stated that an existing pollution permit may be altered or withdrawn. Discharge permits may be altered in the event of changes in policy, technological developments etc. that necessitate that the Norwegian Pollution Control Authority revise the requirements for an entire industry or group of permits. Because licence holders are entitled to reasonably predictable framework conditions, there are limits regarding when the authorities may change an existing permit to make the conditions harsher. If the authorities are considering amending a per-

mit, they must first undertake a new evaluation to balance the needs for removing pollutants on the one hand and the costs these changes will entail for the licence holder that performs polluting activities on the other. In this context, Section 18 of the Pollution Control Act on alteration of discharge permits is applied, and it is also referred to continuously in the deciding of industrial cases, according to the Norwegian Pollution Control Authority. Normally this Section is used to make the conditions in discharge permits more stringent, but sometimes changes are made that entail a relaxing of the conditions in a company's licence. The Norwegian Pollution Control Authority stated that for industry, there are approx. 150 cases per year in which the conditions in discharge permits are altered. The Norwegian Pollution Control Authority takes a fee that is registered for each alteration that is made pursuant to Section 18. It is therefore possible to say exactly how many alterations have been made in the discharge permits. However, it is more difficult to calculate the figures for how many of these changes entail that the permit conditions were made more stringent and how many entail that they were relaxed.

In order to encourage trade and industry to assume greater environmental responsibility and to develop protection of the environment as a criterion of competition on the market, the Ministry of the Environment provides support for the development of environmental technology. The central government's environmental fund is a loan scheme that is administered by the Norwegian Industrial and Regional Development Fund (SND), which grants support to projects to improve environmental technology. Priority is generally given to projects that aim to reduce emissions of greenhouse gases, but it is also possible to apply for support for measures that reduce other types of pollution. The licensing system is used to ensure that the technology is used. The authorities use information to try to promote a general opinion that enterprises should be quick to start using cleaner technology.

With regard to the waste water treatment sector, the Ministry stated that in Norway requirements are not set regarding the use of best available techniques or best environmental practice in order to limit discharges of nutrients from municipal waste treatment facilities. This is because Norway has a receptor-oriented environmental policy. The Norwegian Pollution Control Authority has formulated national minimum requirements regarding removal of certain pollutants from waste water, and the county governors can issue licences that contain instructions to the municipalities in accordance with a receptor-oriented policy.[75] It is thus up to the individual

[75] Letter from the Ministry of the Environment to the Office of the Auditor General dated 22 March 1999.

owner of a sewage treatment facility to choose technology that satisfies the requirements for removal of nutrients and other pollutants.

The Ministry of Agriculture is responsible for ensuring that best available techniques (BAT) and best environmental practice (BEP) are used within the agricultural sector.[76] However, in the audit interview, the Ministry of Agriculture stated that requirements are not set regarding the use of the best available techniques or best environmental practice in the agricultural sector as is generally defined in the OSPAR Convention. In this context, the Ministry refers to the fact that on the international level, it is not possible to define in concrete terms what constitutes best available techniques and best environmental practice; rather it is up to the individual countries to ascertain what suits their needs and situation best. The reason for this is that agriculture varies considerably from country to country, depending on the local natural conditions, entailing that technology and environmental practice also vary accordingly. Norway attaches importance to cost-effectiveness, and according to the Ministry of Agriculture, cost-effectiveness is always necessarily related to technology and environmental practice. Environmental measures aimed at the use of fertilisers may reduce the input of nutrients to the soil (cf. the presentation of the various environmental measures in the agricultural sector in section 4.4.2 below).

4.2 Compliance in the industrial sector

4.2.1 Policy instruments and measures

Cost-effectiveness

The Ministry of the Environment stated that in the industrial sector the companies themselves are free to decide what constitutes a cost-effective system for their operations in connection with discharge permits. The authorities set requirements concerning emissions levels, but the companies must choose the most cost-effective means to achieve the targets in the discharge permit. In addition, most manufacturing firms have releases of pollutants via the municipal sewage system. The discharges from these companies will thus also be reduced as a result of the measures to reduce pollution from municipal sewage plants.

76 Letter from the Ministry of the Environment to the Office of the Auditor General dated 22 March 1999.

Normative instruments[77]

The pivotal policy instrument in the industrial sector is the Pollution Control Act and the licensing system laid down therein.[78] This system is intended to ensure compliance with the requirement in the OSPAR Convention that the authorities must provide for a system to regulate polluting activities and issue discharge permits in the industrial sector. Pursuant to the Pollution Control Act, manufacturing firms that perform activities that cause pollution must have a discharge permit.[79] There are currently approximately 1600 companies in Norway that have discharge permits. Discharge permits may include requirements regarding the volume of production, consumption of raw materials, emissions to water and air, waste and noise levels.[80]

The internal control performed by the companies is also an important means to achieve the goals set out in environmental legislation to protect the external environment against pollution and can contribute to compliance with the objectives of the OSPAR Convention. According to the Norwegian Pollution Control Authority, the instances of non-compliance with requirements that are detected by means of the internal control system are often of a formal nature; for example, perhaps an enterprise does not have copies of all the regulations that govern its activities. Therefore, a violation of the internal control regulations will not always automatically cause harm to the environment. Violations that can be described as environmental crimes are serious instances of non-compliance that entail a risk of adverse environmental consequences if they were perpetrated with a sufficient degree of guilt. According to the Norwegian Pollution Control Authority, it is often misleading to refer to all instances of non-compliance with requirements in the internal control regulations as environmental crime.

---

77 The description of the policy instruments that are used in the three sectors is based on a division into three categories: normative, economic and pedagogical instruments. This system is taken from T. Eckhoff (1983), chapter 2 ”Overview of the means of influence”. Here, means to influence behaviour are divided into four categories: physical, normative, economic and pedagogical instruments. Physical instruments have not been included here as they are not relevant in our context. Normative policy instruments are generally defined as prohibitions and instructions; in connection with the industrial sector, these are mostly Acts of law and regulations the purpose of which is to regulate the activities of the individual company to ensure that they take account of environmental factors. Economic policy instruments in our context are for the most part grants schemes, taxes and other schemes that make it financially advantageous for the individual company to implement measures to preserve the environment. Pedagogical policy instruments are defined in our context as information, seminars, training, guidance and advice.

78 Cf. section 3.2.2 above.

79 Cf. Sections 7 and 11 of the Pollution Control Act.

80 The Norwegian Pollution Control Authority’s Factual Series 95:05 *INKOSYS – The Industrial Control System*.

Economic instruments

The OSPAR Convention's recommendation that the Contracting Parties ought to consider using economic instruments vis-à-vis enterprises in order to ensure "best environmental practice" is implemented in the industrial sector in Norway. The authorities use economic incentives to encourage companies to assume environmental responsibility. The Norwegian Pollution Control Authority stated that up until 1998, *technology funds* were available to companies, i.e. financial support for companies facing expensive investments to convert to more environmentally sound technology. This grant existed from the beginning of the 1990s until 1998.

The Norwegian Pollution Control Authority stated that *EMAS registration* can also be regarded as an economic policy instrument to encourage companies to assume greater environmental responsibility.[81] EMAS registration entails that enterprises commit themselves to performing thorough internal inspections. This kind of scheme can be regarded as an indirect economic measure that increases the incentives to reduce discharges, because the Norwegian Pollution Control Authority performs fewer inspections in EMAS registered companies than non-EMAS registered enterprises. By way of an illustration, the Norwegian Pollution Control Authority said: "Some companies almost feel as if they have moved down a system audit charge class"[82]. The size of the charge for system audit reflects the amount of monitoring performed by the Norwegian Pollution Control Authority and must be paid by the individual company, meaning that a reduction in the amount of monitoring performed by the Norwegian Pollution Control Authority will save the company money.[83]

Routines have been established in the industrial sector whereby polluting enterprises bear the costs of licensing and monitoring. Expenses associated with the processing of an application for a new licence, an application for alteration of a licence, inspections and system audits are charged to

---

81 EMAS stands for the Eco-Management and Audit Scheme. Companies that adopt EMAS commit themselves to charting the company's environmental impacts, introducing an environmental management system, ensuring compliance with legislation and regulations related to environmental issues, setting targets in the form of an environmental programme, performing environmental audits to ensure that the environmental management system is functioning as intended, implementing measures to attain continual improvements in environmental performance, and being more open and informing the public about their environmental performance by publishing an environmental report (the Norwegian Pollution Control Authority's Factual Series no. 7, 1998).

82 *For a more detailed discussion of the inspection classes, see section .4.2.2.1. "The authorities' inspections and system audits" below.*

83 Letter from the Ministry of the Environment to the Office of the Auditor General dated 16 May 2000.

the companies that are monitored by means of inspection fees, as prescribed in regulations.[84]

The rates for the processing of applications for new discharge permits range from NOK 17 600 to NOK 99 500.[85] For changes in licences, companies must pay from NOK 4700 to NOK 40 800, depending on whether the changes are small or substantial. The rates for inspection fees vary according to which inspection class the company has been placed in. For example, the rate for an inspection of a company in inspection class four is NOK 4000, whereas the rate for an inspection of a company in inspection class one is NOK 17 700. In connection with system audits carried out by the Norwegian Pollution Control Authority, companies must pay:

High charge class:	NOK 188 000
Moderate charge class:	NOK 120 000
Low charge class:	NOK 71 300
Extra low charge class:	NOK 39 500

Pedagogical instruments

Dissemination of information about environmental consequences is central to the authorities' work to communicate what constitutes "best environmental practice". In the audit interview, the Norwegian Pollution Control Authority stated that it provides little information to individual companies about cleaner technology, pollutant removal systems, initiatives to stimulate better environmental performance and changes in regulations and penal rules. Furthermore, insofar as it does provide such information, this is not done in close collaboration with trade and industry. On the contrary, the Norwegian Pollution Control Authority is reluctant to provide information for fear of being held responsible for companies' choices of technology.

The Norwegian Pollution Control Authority provides companies with information and advice about internal control systems. For example, seminars on the internal control regulations are held to ensure compliance with the licensing requirements.

The Norwegian Pollution Control Authority stated that it believed it had implemented measures that could be regarded as incitements for the individual companies to reduce their pollution beyond the scope of the given

84 Regulations relating to collection of payment to the Treasury for the Norwegian Pollution Control Authority (SFT)'s licensing and monitoring of polluting enterprises that are subject to licensing requirements.

85 These rates are taken from the regulation that came into force on 31 January 1996.

requirements. The Norwegian Pollution Control Authority stated that a new element has been introduced into the inspection report that is written after each inspection of a company giving an account of the results of the inspection. There is now a section for praise for positive actions, but not for the status achieved. In the report, the Norwegian Pollution Control Authority also commends companies that have set ambitious goals, i.e. goals that go beyond the requirements in their discharge permits. Each individual inspection report is sent to the inspected company. These reports are also available to the public. The Norwegian Pollution Control Authority felt that this might have a positive marketing value for the individual company.

4.2.2 Monitoring practices

The OSPAR Convention's requirement that the Contracting Parties shall provide for a system of regular monitoring and inspection to assess compliance with authorisations and regulations of releases into water or air is met through the Pollution Control Act.[86] A monitoring system has been established to detect the degree to which measures are implemented as intended, which will also have a preventive effect.

Monitoring activities in the industrial sector consist of:

1. *The authorities' inspections and system audits:*
   Inspections consist of an initial inspection and subsequent follow-up inspections of operations of pollution abatement installations, routines for sampling and analyses. Inspections are usually performed without prior warning.
   System audits are extensive forms of inspection and often last for up to a week. The audits include interviews with employees on different organisational levels, inspections of facilities and pollution abatement systems, reviews of relevant routines and procedures, measurement of discharges, etc. The Norwegian Pollution Control Authority sends out two or three representatives to perform system audits. System audits are extremely resource-intensive for the enterprise, so they are given plenty of prior notice.

2. *Pollution reports submitted by the companies*

There are special routines for the performance of the various different types of controls that the companies undertake. Below is a description of the routines that have been developed for the performance of monitoring in industry and an overview of the monitoring practices in terms of the number of inspections and violations of the provisions.

86 Cf. section 3.2.2 above.

4.2.2.1 The authorities' inspections and system audits

The Norwegian Pollution Control Authority has developed a system of risk assessment that it uses to determine where to perform its inspections and system audits. Enterprises are classified into inspection classes on the basis of the size of their discharges and the tolerance of the receptor according to the following criteria:[87]

Companies that have:	Are classified in:
• Considerable emissions, weak receptor or considerable emissions, moderate receptor	Inspection class 1
• Moderate emissions, weak receptor or considerable emissions, tolerant receptor	Inspection class 2
• Moderate emissions, moderate receptor or minor emissions, weak receptor	Inspection class 3
• Moderate emissions, tolerant receptor or minor emissions, moderate receptor	Inspection class 4

The inspection class that a company is placed in in turn determines the type of inspections and how frequently the company will be inspected by the pollution control authorities. Once the company has been inspected, the pollution control authority registers any instances of excessive discharges or non-compliance.[88] Excessive discharges may lead to the company being classified in a stricter inspection class. Companies that report major discharges in excess of the limits set in their permit shall receive quick feedback, and if necessary, be inspected, in order to ensure that the matter is rectified as quickly as possible. The Norwegian Pollution Control Authority requires that all instances of non-compliance with requirements be corrected.

The following rules for *inspection frequency* are used in the different inspection classes:[89]

	Frequency of inspection:	Frequency of system audit
Inspection class 1	Once a year	Every 3 to 6 years
Inspection class 2	Every other year	Every 3 to 6 years
Inspection class 3	Every other year	-
Inspection class 4	Sporadically	-

87 Cf. the Norwegian Pollution Control Authority's procedure no. KA-K7201.
88 Circular from the Norwegian Pollution Control Authority (TA 902/92).
89 The Norwegian Pollution Control Authority's procedure no. KA-K7201.

As demonstrated in table 2, the total number of inspections performed each year in land-based industry decreased from 1995 to 1998. In 1995, 243 inspections were carried out, compared with 180 in 1998. The number of inspections to assess internal control systems was also reduced, from 178 in 1997 to 148 in 1998. However, there was an increase in the number of inspections of actual emissions from 109 in 1997 to 131 in 1998.

Table 2 The Norwegian Pollution Control Authority's inspections of compliance with discharge permits, with the internal control regulations and total, 1995 to 1998

Year:	The number of inspections of actual emissions: *	The number of inspections to assess the internal control system: *	Total number of inspections, land-based industry: **
1995	---	---	243
1996	---	---	215
1997	109	178	221
1998	131	148	180

Source: INKOSYS, the Norwegian Pollution Control Authority.

* Data from this field of inspection have only been recorded since 1997.

** The total number of inspections for land-based industry does not constitute the sum of inspections of actual emissions and inspections of internal control. The reason for this is that inspections of land-based industry encompass several other elements. In connection with each individual inspection carried out by the Norwegian Pollution Control Authority, priorities must be assigned between the following main categories: Internal control systems, processing facilities (including actual emissions), production/consumer waste, special waste, chemicals and the emergency response system. Each of these main categories is further subdivided into areas that may be subject to inspection by the Norwegian Pollution Control Authority.

The number of instances of non-compliance with the individual emissions allowances for the companies in the entire period was relatively high (see table 3). In both 1997 and 1998, approximately 40 % of the inspected companies had violations of their allowances.

Table 3 Instances of non-compliance with conditions in discharge permits, 1995 to 1998
(Figures are only for land-based industries that are subject to licensing)

Year	*Non-compliance / violations in terms of actual emissions:*	
	No. of instances detected	**%**
1995	45	---*
1996	49	---*
1997	41	37.6 %
1998	54	41.2 %

Source: INKOSYS, the Norwegian Pollution Control Authority.
* Data on the total number of inspections performed in this area have only been recorded since 1997. It is therefore not possible to calculate percentages for 1995 and 1996. The percentages for 1997 and 1998 were calculated in relation to the number of inspections to ascertain "actual emissions".

The Norwegian Pollution Control Authority's inspection activities also detected many instances of non-compliance with requirements laid down in the internal control regulations.[90] As demonstrated in table 4, in 1997 60 % non-compliance was detected in relation to the internal control regulations. The following year, this figure had dropped to approx. 45 %.

Table 4 Instances of non-compliance with the internal control regulations, 1995 to 1998
(Figures are only for land-based industries that are subject to licensing)

Year	*Non-compliance / violations of the internal control regulations:*	
	No. of instances detected	**%**
1995	26	---*
1996	71	---*
1997	107	60.1 %
1998	66	44.6 %

Source: INKOSYS, the Norwegian Pollution Control Authority.
* Data on the total number of inspections performed in this area have only been recorded since 1997. It is therefore not possible to calculate percentages for 1995 and 1996. The percentages for 1997 and 1998 were calculated in relation to the number of inspections in the area "internal control".

90 This regulation was amended in 1996/97 and according to the Norwegian Pollution Control Authority, it is difficult to compare the situation before and after this amendment because of changes in the requirements regarding reporting. It is much easier to gauge instances of non-compliance against the new, revised regulations.

In relation to both emissions allowances and the internal control regulations, it is clear that the number of instances of non-compliance with requirements rose from 1995 to 1998. Nevertheless, the increase in actual emissions was relatively small, and in 1997 there was a temporary decrease in emissions. There was a marked increase in the number of violations of provisions in the internal control regulations. If we compare the figures for the number of violations for the various years, we notice a leap in the number of violations in connection with the introduction of the new regulations in 1997. However, the Norwegian Pollution Control Authority stressed in the audit interview that this does not indicate that performance deteriorated, but rather that the requirements had become more stringent. From 1997 to 1998, there was a clear decrease in the number of instances of non-compliance, which may indicate that manufacturing firms were now more familiar with the new regulations.

The Office of the Auditor General investigated the degree to which the county governors believed that the manufacturing firms in their county maintained satisfactory internal control systems. The study was limited to manufacturing firms for which the county governor was the licence-issuing authority. Half (nine) of the county governors stated that the manufacturing firms in their county had a fairly satisfactory internal control system. The other half stated that the manufacturing firms in their county had a fairly unsatisfactory internal control system. None of the county governors responded with “totally satisfactory” or “unsatisfactory”.

4.2.2.2 Pollution reports submitted by the companies

In addition to the pollution control authorities’ inspection activities (inspections and system audits), the monitoring system in the industrial sector is also based on the companies submitting their own pollution reports. Self-inspection is based on the operational inspections programme that is defined in the discharge permit. Each company that has been given a discharge permit must submit a report for each calendar year by 1 March the following year.[91]

Companies must include the following three elements in their annual pollution reports:

Part 1: Statements dealing with specific requirements in the discharge permit

Part 2: Statements of deviations, i.e. descriptions of circumstances that deviate from the specifications of the discharge permit

Part 3: Statements of total annual pollution and waste quantities for the

91 Circular from the Norwegian Pollution Control Authority (TA 902/92).

entire enterprise, i.e. figures for specified components of pollution and waste per calendar year

In respect of the companies' reporting on their performance, table 5 demonstrates that the scope of breaches of actual emissions remained stabile throughout the entire period at around an average of 56.5 %. Reporting is achieved through the companies' annual reports. The number of violations that the companies reported themselves was thus higher than was detected by the authorities' monitoring activities.

Table 5 Instances of non-compliance reported by the companies themselves, 1995 to 1998
(Figures are only for land-based industries that are subject to licensing)

Year	*Companies that have reported one or more instances of non-compliance*	
	No. of instances	**%**
1995	138	57 %
1996	166	58 %
1997	194	52 %
1998	252	59 %

Source: the Norwegian Pollution Control Authority

The relationship between the authorities' inspections and internal monitoring

The system that has been established to detect inadequate compliance with the conditions laid down in discharge permits is based on companies' submission of pollution reports and the authorities' inspection of companies. This system may entail that violations of conditions in discharge permits are not always discovered. The reason for this is that the authorities must react to detected deviation from the requirements laid down in licences, at the same time as they must also encourage companies to report deviations they detect themselves (in their pollution reports) and implement measures and introduce systems to avoid similar occurrences in the future. Thus, harsh reactions may lead to the companies omitting to report violations and unfortunate incidents being kept secret.

In order to avoid circumstances being kept secret, it is important, according to the Norwegian Pollution Control Authority, that companies do not have violations registered twice. The Norwegian Pollution Control Authority underlined that this does not imply that they overlook significant deviations. However, in the Norwegian Pollution Control Authority's guidelines it is not a formal requirement that instances of non-compliance of this nature be reg-

istered in the inspection reports at all; rather, a system has been devised whereby it is up to the professional judgement of the individual inspector. According to the guidelines, if an instance of non-compliance is reported in writing to the Norwegian Pollution Control Authority and processed by the Norwegian Pollution Control Authority, or if an instance of non-compliance is reported to the Norwegian Pollution Control Authority in a company's own pollution report, the matter should not be classified as a deviation in the inspection report. Instead, the matter should be mentioned in the section "Miscellaneous circumstances".[92] The Norwegian Pollution Control Authority registers all instances of non-compliance to give it an overview of the situation, but these figures are not specified in the annual monitoring and inspection reports published by the Norwegian Pollution Control Authority.

The Norwegian Pollution Control Authority stated that large companies are generally extremely professional in their conduct and notify the Authority if they violate the specifications in their discharge permits. The Norwegian Pollution Control Authority believes that harsh reactions on its part do not lead to a deterioration of the climate of co-operation.

4.2.3 Reactions to non-compliance

This section contains a description of the sanctions that are available to the authorities to react to detected violations of requirements in the industrial sector, followed by a presentation of the actual use made of the various different forms of sanctions. In the audit interview, the Norwegian Pollution Control Authority stated that its most important instrument of reaction to deviation from the regulations is to remind the perpetrator of their statutory duty to implement corrective measures. The Norwegian Pollution Control Authority believed that the feedback it has received from monitored enterprises and the Norwegian Pollution Control Authority's spot checks of monitored companies indicate that *reminding the perpetrator of their duty to implement corrective measures* is a simple and effective tool. In those cases where corrective measures are not initiated, the Norwegian Pollution Control Authority imposes pollution fines on the company. Other sanctions in the industrial sector include reporting the matter to the police (bringing criminal charges) and shutting down operations.[93]

The size of a pollution fine can be determined by professional judgement, but should be high enough to ensure that continued violation is not profitable. For example, a typical fine is NOK 1000 per day. Average fines range from NOK 10 000 upwards. Pollution fines may be imposed either

92 Guidelines no. KA-K7208.
93 Cf. section 3.2.2 above.

as a daily charge incurred until the conditions have been fulfilled or as a fixed amount to be paid for each violation.[94]

The Norwegian Pollution Control Authority sends a copy of its inspection report to the inspected enterprise with a cover note. The cover note explain the duty to implement corrective measures in connection with non-compliance with or violation of conditions in the discharge permit. The company is requested to send the Norwegian Pollution Control Authority information about the corrective measures they implemented within a given time limit. If measures are not implemented within this time limit, a reminder is sent with a new time limit for corrective action. This reminder *"may contain notification that the use of pollution fines will be considered if the time limit is not respected."*[95] If the information required has still not been received within the expiry of the new time limit, the Norwegian Pollution Control Authority *shall* decide to impose a pollution fine. The decision entails that the fine will start to accumulate if feedback about implemented measures is not received within a given time limit (usually two or three weeks from the date of the decision). If it is deemed necessary, the Norwegian Pollution Control Authority may decide in individual cases to provide the required information and notify the enterprise about fines in connection with its first form of reaction (in the cover note to the inspection report).[96]

According to the Norwegian Pollution Control Authority, *reporting the matter to the police* is an important tool in connection with serious instances of environmental crime. The Norwegian Pollution Control Authority stated that they always consider whether to ask the police to investigate cases of serious violations that are discovered during their inspections. In many cases, other parties are also entitled to report enterprises to the police. According to the Norwegian Pollution Control Authority, in these kinds of cases, the police always ask the Norwegian Pollution Control Authority to assess the matter. Bringing criminal charges is a resource-intensive form of reaction. The Norwegian Pollution Control Authority stated that it always evaluates which form of reaction will yield the greatest benefit to the environment within the framework of the resources that are available.

The Norwegian Pollution Control Authority gave an account of examples of violations that entail that the enterprise requires special follow up.[97]

---

94 The Norwegian Pollution Control Authority's procedure no.: KA-A6025, section 7.

95 The Norwegian Pollution Control Authority's memorandum "The size of pollution fines and coercive fines", the Norwegian Pollution Control Authority's Procedure no.: KA-A6025, section 7.

96 Cf. Procedure no. KA-A6025, section 4.

97 In an appendix to KA-K7104. Procedure no. KA-K7104 provides guidelines for "Registration and classification of inspections".

Two categories of deviation were afforded particular attention:

- Infringements that created a risk of pollution
- Infringements that resulted in emissions of pollutants or damage to health or the environment

In connection with these types of violations, the guidelines state that bringing criminal charges should be considered if an enterprise is performing activities for which a licence is required without a licence, if there are grounds to believe that the company deliberately provided the Norwegian Pollution Control Authority with misleading information or if important details of significance to the environment were incorrect or were withheld.

Data on the frequency with which the various forms of sanctions are employed shall be available in the INKOSYS database, in which all inspections must be registered. Table 6 demonstrates the degree to which the Norwegian Pollution Control Authority used the various forms of sanctions.

The figures do not reveal any obvious trends. The table demonstrates fluctuations in the use of all the forms of sanctions from year to year, without these changes illustrating an obvious development in any particular direction. However, it is clear that the form of sanction that the Norwegian Pollution Control Authority used most frequently against manufacturing firms was a written reminder of the duty to correct deviations. Use of this form of sanction remained relatively stabile in the period 1995 to 1998, with an average of 243 times per year (ranging from 225 to 265). Both pollution fines and criminal charges were used relatively infrequently, with an average of 3.5 and four times respectively in the period of audit.

Table 6 Frequency of use of various forms of reaction/sanctions, 1995 to 1998 *(Land-based industry)*

Year:	*Written reminder of the duty to correct instances of non-compliance*[98]	*Pollution fines*	*Criminal charges*
1995	246	2	9
1996	222	7	1
1997	265	5	3
1998	238	0	3

Source: INKOSYS, the Norwegian Pollution Control Authority.

98 The number of written reminders for the entire period is larger than the total number of inspections performed in manufacturing companies that are subject to licensing because several reminders may be issued in connection with a single inspection.

In its assessment of the current system of sanctions in the industrial sector, the Norwegian Pollution Control Authority expressed satisfaction with the legal authorities they currently administer. The Office of the Auditor General's survey of the county governors also revealed that a majority of the county governors were of the opinion that the policy instruments available to them in connection with their supervisory functions in the industrial sector were effective. The county governors in six of the 18 counties stated that they found the available policy instruments effective, while 11 stated that they found them fairly effective. Only one respondent stated that the instruments were not very effective. None of the county governors stated that the policy instruments were ineffective.

4.2.4 Reporting systems

There is a joint database in the industrial sector, INKOSYS, that contains information about the implementation of the various environmental measures. Both the Norwegian Pollution Control Authority and the county governors monitor companies and other enterprises and report the findings of their inspections in INKOSYS. The database contains information on:

- all the discharge permits that have been issued and a list of the requirements each enterprise has to fulfil
- inspections carried out by the Norwegian Pollution Control Authority
- annual quantities of industrial emissions and waste

The information recorded in the database is used to determine the monitoring activities that will be carried out the following year and to prepare annual statistics about the results of inspections. The Norwegian Pollution Control Authority receives annual reports from the county governors about contravention of environmental requirements in industry.

The Norwegian Pollution Control Authority claimed that systematic studies have been done to analyse the degree to which the sanctions they use effect improvements in environmental compliance in that the evaluation forms that are completed after each inspection are recorded in INKOSYS. In other words, it is possible to trace the history of each individual company and see any improvements over time.

The county governors' assessment of INKOSYS

The Office of the Auditor General's investigation revealed that all of the county governor's offices in Norway have installed INKOSYS. The county governors in 17 of 18 counties stated that they record all or most of the data from the county's industrial cases in INKOSYS. One respondent stated that the county only recorded data from the county's industrial cases to a limited extent and not consistently.

With regard to the quality of the information that is recorded in INKOSYS, most of the county governors stated that the documentation from the companies' own pollution reports had not changed after the introduction of the system. The county governors of nine counties reported that the quality was as good as before, while three said the information was as bad as before. The audit revealed that four of the county governors felt that the documentation they received from companies had improved after the introduction of INKOSYS. The county governors in two counties did not respond to this question.

The user-friendliness, quality, availability of user manuals and training for users of the database system will affect the degree to which the system functions as intended. The survey of the users' perception of the database's user-friendliness indicates that a majority of the users were not satisfied. One county governor felt that the user-friendliness of INKOSYS was poor, and nine stated that user-friendliness was fairly poor. The county governors of eight counties stated that the user-friendliness of the system was fairly good, but none of the respondents said that it was good.

The county governors' assessment of the user manual for INKOSYS was also charted. Again, the majority stated that they were not satisfied. The county governors in nine counties answered "no" to the question of whether there is a good, up-to-date and easily accessible user manual for INKOSYS, while eight answered "yes" to this question. One county governor did not respond to this question.

In the questionnaire survey, the county governors were asked to give an assessment of the training that the Norwegian Pollution Control Authority offered in connection with INKOSYS. 12 out of 18 county governors stated that the training was inadequate, five said that the training was adequate, and one county governor did not respond to the question.

4.3 Compliance in the waste water treatment sector

The OSPAR Convention recommends that compliance with the obligation to use "best environmental practice" be stimulated through the use of economic incentive schemes and information, in addition to being made mandatory through Acts of law and regulations. This section of the audit report contains a presentation of how the Norwegian authorities have employed these kinds of policy instruments in order to achieve the objectives in the waste water treatment sector.

4.3.1 Policy instruments and measures

In the early 1990s, Norwegian waste water management policy was primarily concerned with constructing ever more sophisticated sewage treatment facilities in order to meet the new requirements for removal of pollutants.[99] However, the requirements regarding the construction of facilities to remove nitrogen were relaxed a little and the amount of grant funding to finance these schemes was reduced in the period 1995 to 1998. We will now give a brief chronological review of the developments in the waste water sector from the Norwegian Pollution Control Authority's analysis of the measures in 1992 to the actual construction of pollutant removal systems and the use of economic policy instruments to stimulate construction of pollutant removal systems.

The grounds for the choice of measures – the Norwegian Pollution Control Authority's analysis of the measures

In 1992, the Norwegian Pollution Control Authority performed an extensive analysis of the various measures that could be used to reduce releases of nitrogen and phosphorus to water, in order to meet the new requirements that had come about as a result of the Ministerial Declaration for the Protection of the North Sea to reduce discharges by half.[100] In its report, the Norwegian Pollution Control Authority proposed that NOK 2700 million be invested in the municipal sector during the period 1991

---

99 Waste water treatment plants can be divided into three categories according to the principle they use to remove pollutants: mechanical, chemical or biological. These principles can also be combined in a single sewage plant. The simplest waste water treatment systems are the mechanical ones, which have a sludge separator, filter or some other physical obstruction that removes the largest particles from the water. Mechanical systems are most commonly found in small private sewage systems in sparsely populated areas. Moving up a level, there are chemical sewage systems whereby chemicals are used to remove certain substances, such as phosphorus. The third type of sewage plants is biological waste water treatment plants, which use micro-organisms to remove easily biodegradable organic matter, such as nitrogen.

100 The Norwegian Pollution Control Authority's Report no. 92:14. The international obligations under the North Sea Declarations have now been incorporated into the OSPAR Convention.

to 1995, by means of which 54 new phosphorus removal plants were to be built and nitrogen removal systems were to be installed in a total of 29 sewage plants. In addition, the existing sewage systems were to be upgraded and discharges from sparsely populated areas were to be reduced.[101]

It was suggested that the largest nitrogen removal facilities should be operational by the end of 1996, and that smaller plants should be operational in 1998.[102] The Norwegian Pollution Control Authority labelled the construction of the largest nitrogen removal installations "stage one" and the construction of the smaller plants "stage two".[103] The Norwegian Pollution Control Authority emphasised that in this way experience could be reaped and expertise built up that would make the construction of the next generation of waste water treatment facilities more efficient and would minimise the risk of bad investment of resources.

In the middle of the 1990s, the Ministry of the Environment was working on a project to concretise the tasks associated with the general renovation of the waste water sector by the year 2000. The municipalities believed that a sum of approximately NOK 7 billion would have to be invested in the period 1995 to 2000 in order to implement all the planned renovation measures.[104]

Economic policy instruments to build pollutant removal plants

In order to encourage the municipalities to give priority to establishing nutrient removal systems, the central government authorities made earmarked grant funds available to the municipalities concerned. Within the municipal waste water sector, nitrogen removal systems were financed to up to 70 % by central government grant funding. Grants for 10–20 % of the costs of building a phosphorous removal system could be awarded to municipalities whose total nutrient removal costs per person equivalent was higher than the national average.[105] Finally, the municipalities could

---

101 The Norwegian Pollution Control Authority's Report 92:14, p. 16f. In addition to these four schemes, the Norwegian Pollution Control Authority recommended implementation of two other measures as part of the package for the municipal sector: the renovation of the pipeline network and the linking up of buildings in marginal areas. However, these two schemes are not covered by this audit and will therefore not be discussed here.

102 The Norwegian Pollution Control Authority's Report no. 92:14. The smallest treatment facilities have a capacity of between 10 000 and 30 000 p.e., whilst large facilities are defined as those with a capacity of more than 30 000 p.e.

103 Letter from the Norwegian Pollution Control Authority dated 5 May 1998.

104 Proposition no. 1 to the Storting (1996-1997), the Ministry of the Environment's budget proposition.

105 Official Norwegian Reports (NOU) 1995:4 *Policy instruments in environmental policy,* page 222.

receive grants for trial projects related to nitrogen removal.[106] The Ministry of the Environment stated in the audit interview that the grant schemes for municipal waste water treatment plants no longer exist. The Ministry of the Environment stated that in addition to direct grants for nutrient removal facilities, subsidies were also granted to NORVAR, a resource centre for the municipalities, and loan schemes were established in the Norwegian State Bank for Municipalities for the construction of nutrient removal facilities.[107]

As demonstrated in table 7 below, large amounts of money were invested in the municipal sewage system up until 1995. In 1996, there was a marked decrease in investments, and the same tendency was expected for 1997. However, the percentage of costs covered by the central government remained fairly stabile throughout the period.

Table 7 Investments and grants in the waste water treatment sector[108]

Year(s)	*Investments (in NOK millions)*	*Central government grants (in NOK millions)*
1985–1990	4262	1064
1991–1995	5926	1702
1996*	297	70
Prognosis for 1997	350	74.5
Total	10 835	2910.5

Source: Proposition no. 1 (1996–1997) to the Storting, the Ministry of the Environment's budget proposition, page 73.
* The investment and grant funds were quoted as preliminary figures.

Reassessment of the need for and the impact of nitrogen removal facilities

In 1994, the Norwegian Pollution Control Authority conducted a study in which the cost-effectiveness of the measures package was assessed.[109] The committee recommended continued investment in the construction of nitrogen removal systems in the largest sewage plants. However, the com-

106 Letter from the Ministry of the Environment to the Office of the Auditor General dated 16 May 2000.
107 Previously, the Ministry provided financial support for the "Environmental Protection in the Municipalities" project (MIK), which helped municipalities to employ environmental advisers.
108 This table only includes investments that received subsidies from the Ministry of the Environment. There were also investments in the waste water treatment sector made without support from the Ministry of the Environment, cf. Proposition no. 1 (1996-1997) to the Storting.
109 See Official Norwegian Reports (NOU) 1995:4 *Policy instruments in environmental policy*, page 234.

mittee also recommended that the Norwegian Pollution Control Authority should update its analysis of the measures in 1995 in order to provide a better foundation for ascribing priorities to measures in the future. The Ministry of the Environment is now considering initiating a new analysis of the measures across traditional sector boundaries.[110]

The construction of nutrient removal facilities has been delayed in relation to the plans, primarily because of the debate among scientists and researchers in the field as to the *usefulness* of these kinds of facilities.[111] This debate has included a discussion about the delimitation of the "vulnerable area" in the North Sea. In the wake of the algae catastrophe, for example, the municipalities in the relevant catchment area were ordered to remove nitrogen from their waste water, but, according to the Ministry, subsequent monitoring showed that the area concerned cannot really be defined as "nitrate vulnerable".[112] Moreover, the central government and the municipalities disagreed about the *financing* of the nitrogen removal facilities. Consequently, a number of municipalities raised the issue with the central government of whether it is right to order sewage plants to remove nitrogen from waste water when there is no firm scientific evidence of the effectiveness of such measures.[113]

As a consequence of the debate on the effectiveness of nitrogen removal, the authorities changed their *policy signals*. This has resulted in the requirements regarding nutrient removal being relaxed in some cases and the grants being reduced. The Norwegian Pollution Control Authority stated that in 1997 the Ministry of the Environment lifted several of the requirements that county authorities had set to the municipalities regarding nitrogen removal facilities. In some places, the county governors themselves relaxed requirements, on the grounds that the national pollution abatement policy had changed. The Norwegian Pollution Control Authority stated that it repealed decisions made by county governors in cases where the Norwegian Pollution Control Authority felt that the specified measures would not have had the intended positive impact. The Norwegian Pollution Control Authority underlined that receptor-oriented

---

110 Letter from the Ministry of the Environment to the Office of the Auditor General dated 16 May 2000.

111 See, for example, Proposition no. 1 to the Storting (1996-1997), the Ministry of the Environment's budget proposition.

112 The need to remove nitrogen from waste water varies according to geographical location. In the inner Oslo fjord, all the major sewage plants are obligated to remove nitrogen, because the Ministry believe this will make a major contribution to improving local water quality. There is currently a great deal of scientific debate about what constitutes the "vulnerable" zones for emission of nutrients.

113 Both the Norwegian Pollution Control Authority and the Ministry of the Environment have emphasised to the Office of the Auditor General that the results of monitoring have not demonstrated any clear positive effects of nitrogen removal.

policies shall always form the basis of all environmental measures in the waste water treatment sector. If a measure does not produce results, it need not be implemented.[114]

The status of the establishment of nutrient removal facilities

In the audit interview, the Norwegian Pollution Control Authority informed the auditors that Lillehammer was the first municipality in Norway to implement nitrogen removal in its waste water treatment installations. In the inner Oslo fjord, two major sewage plants have been equipped with nitrogen removal systems: VEAS, which serves Asker, Bærum and parts of Oslo, and Nordre Follo sewage plant in Ås in Akershus. The sewage plant that treats the waste water from Norway's main airport at Gardermoen also has nitrogen removal facilities.

According to the Norwegian Pollution Control Authority, nitrogen removal facilities remain to be installed in two nitrate vulnerable areas in the eastern part of Norway and in some secondary sewage plants on the southern coast.[115] The installation of nitrogen removal systems at the large sewage plants in Bekkelaget in Oslo and RA-2 in Skedsmo in Akershus have been delayed considerably.[116] Although both of these plants are stage-one plants, they will not have functional nitrogen removal systems until 2000 and 2001. The time limits for the order to build and requirements regarding completion of nitrogen removal facilities at the other large sewage plants that run off to the Hvaler–Singlefjord area have been extended to almost 2005 and constitute the second stage of the project. Notice has already been given that the installation of nitrogen removal facilities at the sewage plants on the western coast of the outer Oslo fjord has been postponed indefinitely for the time being. The Storting has been informed of this matter.[117] In summary, the Ministry stated that six sewage plants have been instructed to install facilities for nitrogen removal, of which four are operational and the other two are expected to be in operation by 2005.[118]

Normative instruments

The pollution licensing system is a crucial element in the application of policy instruments in the waste water treatment sector. Specifications

---

114 "Receptor-oriented policy" focuses on the nature and condition of the receptor of pollution and the cost-effectiveness of the measures.
115 The Norwegian Pollution Control Authority – Memorandum of 5 May 1998.
116 The Norwegian Pollution Control Authority – Memorandum of 5 May 1998.
117 Proposition no. 1 to the Storting (1996-1997).
118 In Report no. 8 (1999–2000) to the Storting *The government's environmental policy and the state of the environment in Norway.*

regarding how much nitrogen and phosphorus individual waste water treatment plants are permitted to discharge into the sea can be defined in licences issued to municipal sewage plants and separate (private) waste water treatment facilities. Requirements for removal of nitrogen and phosphorus are included in discharge permits and therefore also form the background for the pollutant removal systems that are going to be built.

In the audit interview, the Norwegian Pollution Control Authority stated that each individual municipality must prepare a general plan for waste water management for the entire waste water sector. In connection with this general sector plan, the municipalities must also develop a plan for implementation of measures. The general plan for the waste water treatment sector is warranted by the provision in the Pollution Control Act that pollution problems shall be solved for larger areas as a whole on the basis of general plans and local development plans.[119]

The Office of the Auditor General's survey of the municipalities revealed that 85 % of the 360 municipalities that responded had prepared a plan for the waste water management sector (either a measures plan, a general plan or a renovation plan) whereas 15 % had not prepared plans. Of the municipalities that stated that they had prepared a plan for the waste water sector, 22 % had an emergency response plan. The most commonly used measure to ensure emergency preparedness was a system of on-call duty (58 %). Other frequently used measures were the development of routines for dealing with emergencies (41 %) and risk and vulnerability analyses (38 %).

Pedagogical instruments

The Norwegian Pollution Control Authority has sent out information to all the municipalities on how to set pertinent environmental requirements to local businesses that are connected to the municipal sewage network. As an element in this work, the Norwegian Pollution Control Authority devised material flow analyses that identified which hazardous substances the different types of industry emit into the sewage system. Material flow analyses can be an important tool for the municipalities in their regulation of local industries as the local pollution control authority. The Norwegian Pollution Control Authority stated that the material flow analyses have been sent to all the municipalities and that it is up to the municipalities to decide if they want to employ this tool. The Office of the Auditor General's survey of the municipalities revealed that approximately half (51 %) of the municipalities stated that these analyses were not relevant

119 Section 11, third paragraph, of the Pollution Control Act.

for the municipality, and 19 % stated that they were not familiar with the analyses. However, 22 % of the municipalities reported that the material flow analyses had been important in the municipality's activities, but most of these municipalities also stated that the analyses were not important in the formulation of plans, special measures, etc.

4.3.2 Monitoring practices

The requirement in the OSPAR Convention that systems shall be developed for monitoring and inspection are embodied in the provisions of the Pollution Control Act and appurtenant regulations.[120] The monitoring system in the waste water treatment sector consists of two main parts:

1. *The county governors' monitoring of municipal sewage plants.* This part of the monitoring system targets the municipalities as *a polluter*.

2. *The municipalities' monitoring of separate (private) waste water treatment plants. In this part of the monitoring system, the municipalities act as the pollution control authority in their supervision of private waste water treatment installations that are not connected to the municipal sewage system.*

4.3.2.1 Monitoring in the waste water treatment sector on the county level

The County Governors Department of Environmental Affairs performs two types of monitoring activities: audits and inspections. Audits consist of relatively extensive analyses, whereas inspections generally take the form of spot checks. Deficiencies that are detected can either be qualified as instances of non-compliance (deviations) or can be remarked upon. In the Norwegian Pollution Control Authority's standard report templates, instances of non-compliance are defined as "*contravention of requirements laid down in or pursuant to health, safety and environmental legislation*", while remarks are defined as "*circumstances that the supervisory authorities find it is necessary to comment upon in order to promote the interests of health, safety and the environment and that are not encompassed by the definition of instances of non-compliance*". Thus, qualification of an occurrence as an instance of non-compliance represents a harsher criticism than a remark.[121]

120 See Annex I, Article 2, of the Convention and section 3.2.2 of the audit report.

121 The Norwegian Pollution Control Authority's inspection reports for 1995 and 1996 reveals that the county governors in some counties have requested the establishment of an electronic archive of precedents based on previous cases in the waste water management sector treated by other County Governors Departments of Environmental Affairs. This kind of system would facilitate «a unfified understanding of what should be defined as contravention of the applicable requirements».

The figures from the counties that reported to the Norwegian Pollution Control Authority indicate that the county governors became more active in terms of monitoring during the period from 1995 to 1998, cf. table 8.[122]

Table 8 The county governors' monitoring of municipal waste water treatment plants, 1995 to 1998

Year	*No. of audits*	*No. of inspections*	*Total*
1995	20	6	26
1996	17	16	33
1997	24	29	53
1998	25	37	62

Source: the Norwegian Pollution Control Authority's inspection reports for 1995, 1996, 1997 and 1998, which are based on reports from the County Governors Department of Environmental Affairs. In 1995 and 1997, 17 out of 18 county governors reported figures for their monitoring activities. In 1996, the Norwegian Pollution Control Authority received reports from 12 of 18 counties. In 1998, the county governor in all 18 counties submitted reports.

According to the Office of the Auditor General's questionnaire survey of the county governors, 13 counties systematically monitored compliance with requirements regarding discharges from municipal waste water treatment plants, while in five counties, this monitoring was not systematic. 16 of the counties had performed system audits on municipal waste water treatment plants in the period 1995 to 1998 – only one county had not performed a system audit. Of these audits, only one county found instances of non-compliance or violation of conditions.

The focus of monitoring and detected deficiencies

The reports from the County Governors Departments of Environmental Affairs varied quite considerably with regard to the degree of detail and how many responded. In the period 1995 to 1998, the Norwegian Pollution Control Authority's template for reporting was revised and made more structured and figure-based. In 1995, the reports consisted of a general description of *typical* elements that were monitored in the checks, but there were no quantitive data on the number of checks performed or the findings. All 13 counties that submitted reports on their monitoring of municipal waste water treatment plants confirmed that they had checked the facilities' internal control systems. Most of them had also

122 The sources of these figures is the Norwegian Pollution Control Authority's Memorandum of 5 May 1998 "Summary of the results from monitoring activities performed by the County Governors Departments of Environmental Affairs 1995 to 1998" (hereinafter referred to as the Norwegian Pollution Control Authority's inspection reports for 1995, 1996, 1997 and 1998).

checked compliance with the specifications in discharge permits. Some of them stated that they had monitored operation and maintenance of the waste water treatment plants and monitored emissions. Deficiencies were generally found in connection with these three types of checks.

The Norwegian Pollution Control Authority's 1996 inspection report also contained a general description of *typical* elements that were monitored, which resembled those from the previous year, i.e. compliance with discharge permits and the internal control systems. In 1996, the list of typical elements also included the emergency response system for acute pollution and problems related to nutrient input.[123] In 1996, the Norwegian Pollution Control Authority generated quantitive data on findings from the county governors' monitoring activities. Inadequate internal control systems and deficiencies in the operation of sewage plants topped the list in 1996.

In 1997 and 1998, the *percentage* of checks performed on waste water treatment plants that revealed instances of non-compliance was included in the reports. The data about these checks are presented in table 9 below.

Table 9 Monitoring results from inspections of municipal sewage plants. Focus areas and findings. 1997 and 1998

Areas that were monitored	*The number of inspections in focus area*		*% of inspections that resulted in detection of instances of non-compliance*		*% of inspections that resulted in remarks*	
	1997	*1998*	*1997*	*1998*	*1997*	*1998*
Duty to perform internal control	30	54	47 %	28 %	3 %	30 %
Supervision and maintenance of the internal control system	28	54	52 %	37 %	28 %	31 %
Emissions regulated in permits, water	20	20	85 %	55 %	40 %	20 %
Emissions monitoring, water	19	27	47 %	44 %	32 %	22 %

Source: the Norwegian Pollution Control Authority's inspection reports for 1997 and 1998.

123 A list of topics that more than four counties named as a priority area.

These figures reveal that a significant number of the inspections found that sewage plants had emitted larger amounts of pollutants than they were authorised to. In 1997, there was 85 % non-compliance for regulated discharges to water. In 1998, this figure had dropped to 55 %. In 1998, deficiencies were still being found in the municipalities' internal control of their waste water treatment installations. In this context, the Norwegian Pollution Control Authority stressed in its inspection report that there was insufficient charting of the hazards and the measures available to minimise these hazards.

Internal control

According to the Norwegian Pollution Control Authority's inspection reports, the percentage of enterprises that did not have an internal control system or whose internal control system had material deficiencies decreased in the period 1995 to 1998. In 1995, the reporting from the county governors in some counties was so inadequate that there was "little point in even attempting to generate national statistics on the introduction of internal control systems in the municipalities".[124] The general impression that the Norwegian Pollution Control Authority gleaned from the reports submitted in 1995 was that the municipalities had informed the county authorities that internal control systems had been established, but that inspections had revealed that important elements of the system were missing or that documentation could be provided of the system without it necessarily having been implemented or functioning as intended.

In 1996, a little over half of the municipalities in the 12 counties that reported to the Norwegian Pollution Control Authority had established and implemented internal control systems. Although the other half of the municipalities had not completed developing their internal control systems, most of them had *started* development. There were significant variations between the counties. In 1997, figures were available for a larger number of municipalities, and the introduction of internal control systems had come further. It is difficult to compare the figures when so few of the relevant parties submitted reports on the matter. As demonstrated in table 10, in 1997 four of the registered municipalities had not yet started introducing internal control systems, but the percentage of municipalities that had "started" had increased compared with the previous year. In 1998, the county governors' reports contained data on a larger number of munici-

124 Appendix 1 to the Norwegian Pollution Control Authority's inspection report for 1995: "Status of internal control in the municipalities". This appendix contains figures from the county governors in Buskerud, Finnmark, Hedmark, Hordaland, Troms and Vestfold and some figures supplied by the county governors in Vest-Agder, Sør-Trøndelag and Nord-Trøndelag.

palities. The trend appears to be the same. A larger percentage of municipalities had introduced an internal control system, although there were still some municipalities that had not yet implemented an internal control system and there were deficiencies in some of the systems that had been implemented, cf. table 9 above on the focus areas and findings of inspections.

Table 10 The number of municipalities that had implemented an internal control system, 1996 to 1998

Status of the internal control system:	*1996*	*1997*	*1998*
Not started	24	4	14
Started, but not completed	101	157	169
Established and in use	143	140	223
The total number of municipalities that were checked by the county governor (out of the 435 municipalities in Norway)	268	301	406

Source: the Norwegian Pollution Control Authority's inspection reports from 1996, 1997 and 1998. These reports do not include figures for all the counties (cf. chapter 2 above).

Similar tendencies are also reflected in the material from the Office of the Auditor General's questionnaire surveys. In the survey of the municipalities, 74 % stated that they now had an internal control system for all their waste water treatment installations, while 26 % stated that they did not. The questionnaire survey of the county governors revealed that the county governors in four counties believed that the municipalities in the county had satisfactory internal control systems, 11 thought they were satisfactory to a limited degree, and three found that they were not very satisfactory.

4.3.2.2 Monitoring on the municipal level: Supervision of separate waste water treatment plants

Roughly 20 % of the population of Norway is connected to a separate (i.e. private) waste water treatment plant.[125] Nevertheless, although this only constitutes a small part of the population, a considerable percentage of the inputs of nutrients come from separate waste water treatment installations, as is illustrated in table 11 below. The reason for this is that small, private sewage treatment facilities have a much lower degree of pollutant removal than large installations with more advanced technology.

"Sewerage systems with no treatment and mechanical treatment plants account for a substantial share of total discharges, even though they

125 According to Statistics Norway's report no. 99/2.

transport/treat only a minor part of total waste water quantities. For chemical/biological treatment plants the result is the opposite, these are responsible for only a small share of total discharges even though they treat a large share of total waste water in Norway".[126]

Table 11 Discharges (in tonnes) of phosphorus and nitrogen from different types of sewage treatment facilities, 1997

Source of discharge:	*Phosphorus*	*Nitrogen*
Municipal sewage plants	570 350	11 830
Separate sewage plants	341 000	3243
Sewage systems with no treatment	237 500	1860
Total	1 149 000	16 933

Source: Statistics Norway 1999/2.

The municipalities have been charged with monitoring separate waste water treatment facilities. The Office of the Auditor General's questionnaire survey of the municipalities revealed that approx. 43 % of the municipalities performed inspections of separate waste water treatment plants, whereas approx. 57 % stated that the municipality did not perform inspections of private sewage facilities. Table 12 below demonstrates that in 1995 a little over 12 % non-compliance was registered, and in 1998 14 % non-compliance was detected in inspections of separate waste water treatment installations.

Table 12 The number of operational inspections of separate waste water treatment plants, 1995 to 1998

Year	*The number of operational inspections performed*	*The number and percentage of violations and/or instances of non-compliance detected in inspections*	
1995	12 318	1555	12.6 %
1996	12 830	1462	11.4 %
1997	16 409	2513	15 %
1998	15 954	2253	14 %

Source: The Office of the Auditor General's questionnaire survey of the municipalities, 1999.

126 Statistics Norway's report no. 99/2: 30. Note that this statement applies to the whole country, not just the areas that that drain into the vulnerable part of the North Sea.

Proposed changes in the distribution of responsibility between the central government and the municipalities

The Ministry of the Environment wants to delegate greater responsibility to the municipalities in the waste water sector in areas where the county governor is currently responsible for monitoring. The reasoning behind this change is that problems of nutrient enrichment are generally of a very local nature. Under the current system, the municipalities are responsible for monitoring private sewage treatment facilities with a capacity of up to 25 person equivalents (p.e). A new regulation was circulated for official consultation and comment with a time limit of 1 January 2000, proposing that the municipalities be given the responsibility for regulation and monitoring of sewage plants with a capacity of up to 2000 p.e. This new regulation was adopted by the Ministry on 12 April 2000 and will come into force on 1 January 2001, replacing the current regulation regarding discharges from separate waste water treatment plants on the same date. The new regulation grants the municipalities authority to issue discharge permits to waste water treatment facilities with a capacity of up to 1000 p.e.[127]

The Norwegian Pollution Control Authority's inspection reports for 1995 and 1996 indicate that the county authorities in some counties have queried the ability of the municipalities' to undertake the necessary monitoring activities. They expressed concern that the municipalities may not have received all the necessary information about the internal control systems that they will need. In 1996, the County Governor of Troms suggested "a proactive information campaign followed by inspections with standardised patterns of reaction" and a statement from the central government clarifying how the various different authorities should relate to the municipalities. The County Governors Department of Environmental Affairs in Troms county also felt that the municipalities did not know enough about the monitoring duties ascribed to them according to the regulations and that they should be made aware of these responsibilities.

4.3.3 Reactions to non-compliance

By virtue of their responsibility for municipal sewage plants, the municipalities are *polluters* and in that context are subject to inspection by central government pollution control authorities, which in this case is the county governor. Monitoring the municipalities as polluters entails challenges for the central government in terms of governance. This was

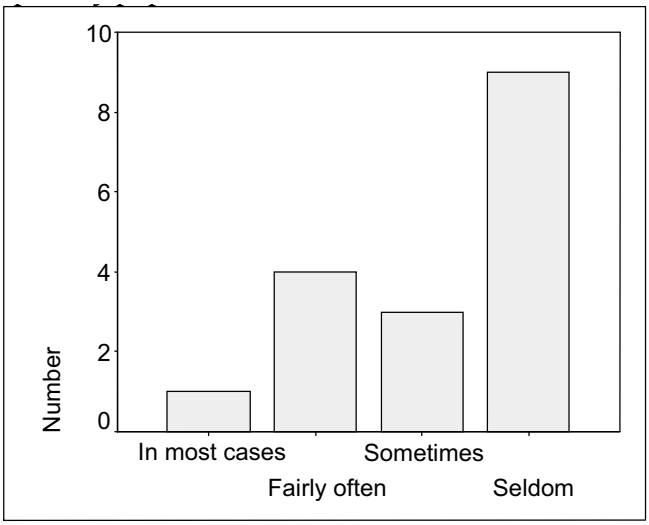
127 Letter from the Ministry of the Environment to the Office of the Auditor General dated 16 May 2000.

revealed in an interview with representatives from the Ministry of the Environment who stated that the policy instruments available to them to perform inspections, issue directives and impose fines on municipalities are not always as effective as those they can use in relation to industry and other private actors. According to Section 55 of the Local Government Act, a municipality may not be proceeded against for insolvency; but if it has payment difficulties that are not purely transitory, a municipality may be placed under administration pursuant to Section 56. However, this instrument is seldom employed in practice. The instruments available to perform inspections and apply sanctions against the municipalities were also assessed by the committee appointed to evaluate environmental policy instruments, (Norwegian Official Reports (NOU) 1995:4). The Policy Instrument Commission reported that "*the government has traditionally been more reticent in using sanctions such as pollution fines against the municipalities than against private actors within industry and agriculture that have equivalent emissions*". In the audit interview, the Norwegian Pollution Control Authority stated that it was not aware of this.

The Ministry's general experience was that the traditional policy instruments used to govern the municipalities were not sufficient in practice to ensure that the municipalities fulfilled their environmental responsibilities. The Ministry pointed out that pollution fines were imposed in the form of accumulative charges on municipalities that did not comply with the prescribed central government requirements. According to the Ministry, the sewage treatment plant at Bekkelaget was forced to pay very high pollution fines, because the system was not operational within the time limit set by the county governor.

In connection with the audit, the county governors were asked if they intervened when municipalities have problems with pollution from sparsely populated areas. Figure 3 illustrates that most (nine) of the county governors seldom intervened when municipalities had problems with pollution from sparsely populated areas. The county governors in three counties stated that they "sometimes" intervened, four answered "fairly often" and one said in most cases.

Figure 3 Frequency with which county governors intervened in cases of pollution from sparsely populated areas



Source: The Office of the Auditor General's questionnaire survey of the county governors, 1999 (N=17).

In those cases where the county authorities intervened, eight stated that the municipality concerned "always or usually" complied with the request and implemented the necessary measures, four reported "sometimes" and four said their requests were seldom implemented by the municipality.

Table 13 demonstrates the county governors' reactions and use of sanctions against municipal sewage facilities. As can be seen from this table, the most frequently used form of sanctions by far was the most lenient form of reaction, namely a written order to take corrective action. There were slight variations in use in the period from 1995 to 1997, when there was a sudden increase from 27 to 49 cases of municipalities receiving an order to take corrective action. Pollution fines were used in very few cases. No instances of non-compliance were reported to the police in the period of audit. It should be noted that the 20 pollution fines imposed in 1998 were all from a single county.

Table 13 The county governors' reactions/use of sanctions against municipal sewage plants, 1995 to 1998

Year	*Written order to take corrective action*	*Pollution fines*	*Criminal charges*
1995	25	–	–
1996	20	1	–
1997	27	–	–
1998	49	20	–

Source: The Office of the Auditor General's questionnaire survey of the county governors, 1999.
A dash "–" indicates that no response was received, meaning it is uncertain whether sanctions of this nature were employed and whether there are data about their use.

The municipalities were asked about their reactions in their capacity as a regulatory authority to unsatisfactory circumstances in private waste water treatment plants in the period 1995 to 1998. Table 14 shows that there was an increase in the number of applicants that were refused a discharge permit between 1995 and 1998 (62 compared with 134). There was a similar increase in the number of facilities that were given orders to implement changes. In 1995, 410 private sewage facilities were sent orders to implement changes, and in 1998, 492 plants received such orders. In respect of harsher sanctions, such as pollution fines, there was some variation from year to year, with the fewest (four) fines imposed in 1996 and the most (20) in 1997. Criminal charges were brought against one party each year, with the exception of 1996, where none of the municipalities stated that they reported matters to the police as a form of sanction.

Table 14 The municipalities' reactions/use of sanctions against separate waste water treatment plants, 1995 to 1998

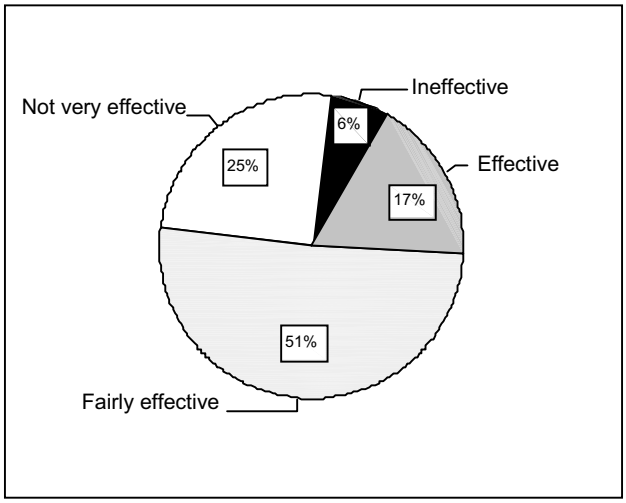
Year	*The number of applicants that were denied a discharge permit*	*The number of orders to implement changes*	*The number of pollution fines imposed*	*The number of matters reported to the police*
1995	62	410	7	1
1996	72	474	4	-
1997	107	462	20	1
1998	134	492	6	1

Source: The Office of the Auditor General's questionnaire survey of the municipalities, 1999.

Under the current system, the municipalities are not entitled to charge owners of separate waste water treatment plants for their monitoring and inspection activities per se, but only if violations are discovered. From 1 January 2001, pursuant to the regulations relating to discharges from small waste water treatment plants, the municipalities will also have the legal authority to lay down regulations regarding collection of charges for the municipality's processing and monitoring in accordance with the regulation.[128]

The survey showed that a majority of the municipalities were satisfied with the policy instruments available to them in connection with monitoring. A total of 69 % of the municipalities that responded stated that the instruments available in connection with their regulatory functions were effective or fairly effective. 25 % felt that the instruments were not very effective, and six percent of the municipalities stated that the instruments were ineffective, cf. figure 4 below.

Figure 4 The municipalities' opinion of the effectiveness of the instruments available to them as a regulatory authority in the waste water management sector



Source: The Office of the Auditor General's questionnaire survey of the municipalities, 1999 (N=311).

128 Letter from the Ministry of the Environment to the Office of the Auditor General dated 16 May 2000.

On the county level too, a majority found the policy instruments available in connection with their regulatory tasks reasonably effective. According to the results of the survey, six of the county governors found the instruments they could use in the waste water sector effective, 11 said they were fairly effective, and one said that the available instruments were ineffective.

4.3.4 Reporting systems

The database system SESAM is used in the waste water treatment sector to report information about measures that have been implemented to achieve the given environmental targets. The municipalities report to the county governor, who in turn reports to the Norwegian Pollution Control Authority via the SESAM database. Statistics Norway and the Norwegian Pollution Control Authority collaborated on collection of data about the waste water treatment sector and have been asked to review the monitoring and verification of the data. Statistics Norway reported that there have been a number of problems in connection with SESAM both for the municipalities and for the County Governors Departments of Environmental Affairs, and explained the reasons for this as follows:

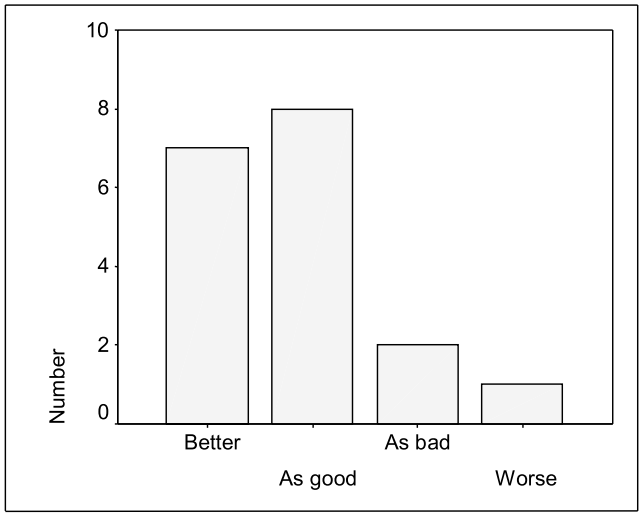
"The main problems are related to the fact that people were unfamiliar with the new software and that some of the entry fields were a little confusing and often misunderstood. There was variation between the counties regarding their compliance with the prescribed time limits and how much work they invested in gathering data and verifying them. As of 1 August 1998, there was still one county that had not reported its figures and several counties that had major deficiencies in their reports. (…) In general, the reporting for 1997 was of an inferior quality compared to that for the previous year".

According to Statistics Norway, the transition to the computer system SESAM was more problematic than anticipated, and some the data recorded were of an insufficient quality or have been lost. "*Some municipalities have actually not managed to report their figures for 1997, even after being given a four-month extension on the time limit*". As a result of the lack of reporting and the poor quality of some of the data that were received, it was difficult for Statistics Norway to complete its analysis.

In 1999, in the Office of the Auditor General's survey, the county governors in all the counties were asked whether the quality of the documentation in the reports they received from the municipalities had improved after the introduction of SESAM, cf. figure 5. The survey revealed two factors. Firstly, a majority of 15 thought that the quality of the data had

remained the same or improved after the introduction of the new database system SESAM. Secondly, a majority of the county governors (10) nevertheless held that the quality of the data had not changed after the introduction of SESAM.

Figure 5 The county governors' assessment of the quality of data after the introduction of SESAM



Source: The Office of the Auditor General's questionnaire survey of the county governors, 1999 (N=18).

In respect of user-friendliness, a clear majority of the users stated that they were satisfied with SESAM. The county governor in 14 counties stated that in terms of user-friendliness, SESAM's user interface was good or fairly good, compared with four that found it not very good or bad. Twelve of the respondents stated that the user manual for SESAM was good, up-to-date and easy to use, whereas five were not satisfied with the manual. In respect of the training that was provided in connection with the introduction of SESAM, 16 county authorities stated that they had received sufficient training, whereas two felt they had not received sufficient training. A seminar was held in SESAM for all the counties in winter 1999.[129]

[129] The Ministry also states that a new version of SESAM was launched in November 1999 and seminars were held for the county authorities in November and December 1999. (Letter from the Ministry of the Environment to the Office of the Auditor General dated 16 May 2000).

4.4 Compliance in the agricultural sector

The Ministry of the Environment has the overall responsibility for ensuring compliance with the provisions of the OSPAR Convention. However, the Ministry of Agriculture is responsible for implementing environmental measures in the agricultural sector. We will now give a brief explanation of the distribution of responsibility between the environmental authorities and the agricultural authorities and how this manifests itself in practice. We will then study the measures and policy instruments that are employed to ensure compliance with the provisions of the OSPAR Convention. This is followed by a section on monitoring and the degree to which the measures are implemented as intended. Finally, we will look at the degree to which reporting makes a useful contribution to central control and monitoring.

4.4.1 Distribution of responsibility between the environmental authorities and the agricultural authorities

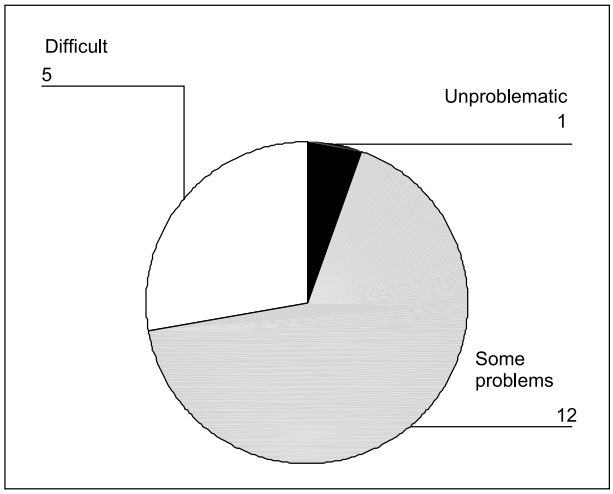
In the audit interview, the Ministry of Agriculture informed the Office of the Auditor General that the responsibility for Norway's international compliance with the OSPAR Convention in the agricultural sector was transferred from the Norwegian Pollution Control Authority to the Ministry of Agriculture in 1995. The background for this decision was the fact that this work involved a great deal of highly specialised agricultural knowledge, and as a result of the principle of sectoral responsibility it was more natural that this task should lie with the Ministry of Agriculture. The Ministry of Agriculture collaborates very closely with the Norwegian Pollution Control Authority in connection with agricultural matters under the OSPAR Convention.

The interviews with representatives of the Norwegian Pollution Control Authority and the Ministry of Agriculture revealed variation in opinions about the way in which environmental efforts are undertaken in the agricultural sector in the committees and working groups under OSPAR. The Norwegian Pollution Control Authority believed that the transfer of authority had come about against the background of several years of disagreement between the Ministry of Agriculture and the Norwegian Pollution Control Authority regarding what constituted the best environmental policy in the agricultural sector. The Norwegian Pollution Control Authority expressed a perception of a "lack of presence" on the part of the agricultural authorities in the working groups and committees under the OSPAR Commission since authority had been transferred. By contrast, the Ministry of Agriculture reported that it collaborated closely with the Norwegian Pollution Control Authority on agricultural matters encompassed by the OSPAR Convention.

On the national level too, there was a need to improve the co-ordination between the environmental authorities and the agricultural authorities. In the letter of allocation to the county governors, it was stated that a conference was to be arranged on collaboration between the county departments of agriculture and environmental affairs. The purpose of this seminar was to distribute the environmental challenges in agriculture more clearly between the two sectors.[130] The Ministry of the Environment stated in the audit interview that on the central level today, there is excellent collaboration between the Ministry of the Environment and the Ministry of Agriculture. They work in close contact with one another and have established good inter-ministerial routines; for example, the Secretaries General of the two ministries meet regularly.

The auditors investigated the county governors' perception of the work to co-ordinate the objectives in the environmental and agricultural sectors. Figure 6 demonstrates that there was a majority of 12 that felt there were some problems, but that on the whole, the goals could be combined. A minority of five reported that they found it difficult to co-ordinate environmental targets with the goals and objectives for the agricultural sector, and that in many cases, the goals could not be combined. One county governor stated that co-ordination of the objectives was unproblematic and that the targets were easy to combine.

Figure 6 The county governors' opinion of the work to co-ordinate objectives between the agriculture and environmental sectors



Source: The Office of the Auditor General's questionnaire survey of the county governors, 1999 (N=18).

130 Letter of allocation from the Norwegian Pollution Control Authority (SFT) to the County Governor, 1998.

4.4.2 Policy instruments and measures

The Norwegian Pollution Control Authority's analysis of the measures

The Norwegian Pollution Control Authority studied the cost-effectiveness of the various measures that have been implemented with the aim of reducing nutrient run-off from agriculture, but new knowledge means that it has since become necessary to alter the content of some of the measures. The official report about the cost-effectiveness of the measures was published in 1992 and is referred to in this audit as "the analysis of the measures". The Norwegian Pollution Control Authority calculated the annual costs and the investment costs connected to the implementation of each of the various possible schemes and measures in the agricultural sector. On the basis of this analysis, the Norwegian Pollution Control Authority then recommended a number of schemes and measures, which were approved by the Storting after treatment in Report no. 64 (1991–92) to the Storting *Concerning Norway's implementation of the North Sea Declarations*. The Report also left room for the Ministry of Agriculture to assess and propose further instruments if developments in the circumstances or knowledge entailed that there were grounds to implement new measures. The Ministry of Agriculture pointed out to the Office of the Auditor General that the design of policy instruments and measures to implement environmental policy in agriculture was often marked by a sense of "not really knowing where it was going until it had started going there".

Changes that have been made to the policy instruments and measures used in the agricultural sector so far have not been based on an *overall analysis* across traditional sector boundaries. In 1996, the Ministry was supposed to initiate a new general review of the environmental policy instruments, including the "green" taxes in agriculture.[131] This was in conjunction with the development and implementation of a co-ordinated environmental programme on the central government level and environmental plans on the user level. The project to introduce an environmental programme and environmental plans was delayed somewhat, but was finally completed in autumn 1999. The Storting was informed about the principles of the project in Report no. 19 (1999–2000) to the Storting *Agriculture and food production in Norway*. A working group is currently developing the details of the environmental programme and the environmental plans. This work shall be completed by 1 February 2001. The goal is that the programme and the plans shall be implemented and in full use in 2002.[132]

---

131 Proposition no. 1 (1997–98) to the Storting, the Ministry of Agriculture's budget proposition.
132 Letter from the Ministry of Agriculture to the Office of the Auditor General dated 4 May 2000.

Legal instruments

The Ministry of Agriculture stated that the normative and legal instruments available to implement environmental targets are designed and developed by inter-ministerial collaboration. Proposals are usually prepared by a working group and are then developed further by the Ministry that is responsible for administering the procedures of official consultation in the case in hand. There is always close collaboration with the Ministry of the Environment in environmental matters. The legal instruments in connection with environmental policy are founded on the Land Act, the Pollution Control Act and the Act relating to pesticides.[133]

Pedagogical instruments

The provision of information and scientific knowledge about the environmental consequences of various actions can help promote "best environmental practice". The Ministry of Agriculture makes use of pedagogical policy instruments such as provision and distribution of information and advice about the environmental measures. For example, the Ministry sent out information brochures about ecological pollution abatement measures and environmental planting schemes, cover crops and sodded waterways and a handbook for assigning priorities to areas in connection with awarding the grant for alternative tilling and cultivation methods.

Economic instruments

The OSPAR Convention recommends that the use of "best environmental practice" be achieved by a number of methods, including the application of economic instruments. In the agricultural sector, economic instruments are used widely in the form of schemes for which grant funding is made available, by means of the Agricultural Agreement and through measures warranted by the Land Act. Schemes of this nature can provide agricultural actors with an incentive to implement the environmental measures concerned and are primarily used in connection with measures intended to reduce diffuse source discharges of nutrients. Taxes and special duties are another form of economic policy instrument that can be used to reduce pollution from agriculture, such as the tax on pesticides and the former tax on artificial fertilisers.

133 The provisions of the Pollution Control Act relating to the agricultural sector are not part of the audit remit, cf. section 1.3 above, with the exception of the manure regulation of 26 November 1998, which is founded on both the Pollution Control Act and the Land Act.

The measures

In a letter, the Ministry of the Environment informed the Office of the Auditor General about the measures that have been implemented with the aim of ensuring fulfilment of Norway's obligations pursuant to the OSPAR Convention. These measures can be grouped into five main categories:

1. Measures to eliminate diffuse source discharges that aim to reduce soil erosion by means of changes in cultivation methods and ecologic measures. This category includes the schemes *alternative tilling and cultivation methods, environmental improvements in cereal-growing areas* and *sedimentation ponds* (cf. the regulations relating to the investment grant for environmental measures).
2. Measures to reduce inputs of nutrients to the soil including measures aimed at the use of fertilisers. This category includes schemes that have been designed as regulations, such as *the regulations relating to livestock manure* and *the regulations relating to fertiliser plans.*
3. Technical measures that aim to reduce point source discharges. This category includes grants paid out pursuant to the *regulations relating to the investment grant for environmental measures*, etc.
4. Measures linked to the use of pesticides. This category includes the *plan of action to reduce risks entailed by use of pesticides* and the *regulations relating to pesticides*.
5. Administrative measures: This category includes *The Norwegian Environmental Monitoring Programme (JOVÅ) and impact assessment in agriculture.* (See section 4.4.4 below on reporting systems)

The Ministry of Agriculture provided the Office of the Auditor General with more detailed information about the measures that have been implemented and that are still in use today within the agricultural sector that are also part of Norway's steps to comply with the OSPAR Convention. According to the Ministry, the targets laid down in the North Sea Declarations regarding reductions of nitrogen emissions are so ambitious that it has been necessary to implement all the relevant measures that can help to reduce emissions.

4.4.2.1 Cultivation measures linked to diffuse source discharges

The schemes that target specific tilling and cultivation methods aimed at diffuse source discharges have not achieved the desired geographical precision. It was discovered that the funds under these schemes were not always allocated to the areas in which they would have had the greatest environmental impact. This was the case for the grant scheme *alternative tilling and cultivation methods*, which was introduced in autumn 1991.

Under this scheme, special financial support can be granted to operating units that grow cereals and oil-producing plants that do not plough in the autumn in areas that are prone to erosion, to open fields sowed with cover crops and to areas with sodded waterways and zones of permanent vegetation.

In respect of the geographical distribution between the "vulnerable" area and the country as a whole,[134] calculations from Statistics Norway indicate that the degree of implementation of alternative tilling and cultivation methods was lowest in the vulnerable area. This was demonstrated in the impact assessment that charted the scope of areas that have converted to alternative tilling methods in order to reduce nutrient run-off. Here it was shown that the general positive development in reduced autumn ploughing has not been seen in the areas where this measure would have the greatest environmental impact. The report from Statistics Norway states that the areas where it is most important to *reduce* the amount of autumn ploughing currently have the *highest percentage* of autumn ploughed agricultural land. Nevertheless, there has been a positive development in that there was a decrease in the percentage of cereal-growing land that was ploughed in the autumn across the country as a whole from 1989/90 to 1997/98. Since then, the percentage has increased slightly.[135]

In 1998 and 1999, NOK 98.1 million was allocated in grants under the scheme "alternative tilling and cultivation methods". Since 1994, an average of NOK 93 million has been paid out each year under this scheme. The grant funds are distributed to areas according to whether they have low, moderate, high or very high erosion risk. Over half of the grant funding (58.5 %) was allocated to cereal-growing areas that had low or moderate erosion risk, while the rest of the funds (41.6 %) went to cereal-growing areas that had high or very high erosion risk. Areas with high and very high erosion risk constituted 27 % of the total area that had been charted, but this figure is not representative for the total land area in the counties, as the charting project focused on charting the areas that were most at risk from erosion first.[136]

---

134 The measures in question are also intended to fulfil the *national* targets of reducing the pollution of Norwegian watercourses, i.e. pollution that has local impact and in particular reduction of run-off of phosphorus and soil particles, in addition to the international targets of reducing discharges of phosphorus and nitrogen to the vulnerable area in the North Sea. (Source: Letter from the Ministry of Agriculture to the Office of the Auditor General dated 4 May 2000.) The national targets for reducing pollution that has local impact do not coincide with the marine area covered by the OSPAR Convention and were therefore not studied in this audit.

135 Report no. 99/12, Statistics Norway: Impact assessment in agriculture 1999.

136 Report no. 99/12, Statistics Norway: Impact assessment in agriculture 1999.

In respect of areas where stubble was left until the spring[137], a decline to 36.4 % of the total cereal-growing land was registered for the country as a whole in 1997/98. For the areas that are particularly sensitive to phosphorus and nitrogen, these figures were 34.6 % and 32 %, respectively, which, according to the impact assessment performed by Statistics Norway, is "*well below the national average*".

According to the Ministry of Agriculture, measurements of the concentration of nutrients in watercourses have not shown any reductions in the amounts of phosphorus and nitrogen that are transported in the watercourses to the North Sea. This includes all the measures in the agricultural sector and other sectors that have discharges of phosphorus and nitrogen. However, measurements in streams that are close to places where environmental measures have been implemented demonstrated reductions in concentrations of nutrients and especially of phosphorus. This indicates that the measures are having a positive effect, but the data do not provide sufficient grounds to quantify the overall effectiveness of the measures. Instead, the impact of the measures must be evaluated on the grounds of the results of trial projects that have been carried out.[138] In connection with the Annual Agricultural Settlement for 1999, the scheme to implement alternative tilling and cultivation methods was expected to play an important role in the continuing work to reduce erosion and pollution of watercourses.[139]

4.4.2.2 Measures linked to the use of fertilisers to reduce diffuse source discharges

The use of fertilisers affects run-off of phosphorus and nitrogen from agriculture. In connection with the Annual Agricultural Settlement for 1995, the Storting was informed that the Norwegian Pollution Control Authority's analysis of the measures suggested that some of the measures had yielded smaller reductions in inputs of nitrogen and phosphorus to the North Sea than expected. This applied in particular to the group of measures "changes in fertiliser application", "split application of fertiliser" and "reduction in the amount of fertiliser used per hectare". The reason for these results is perhaps partly that the degree of implementation of the schemes "use of cover crops" and "split application of fertiliser" was also lower than expected. Another reason may be that the conditions on the basis of which the expected effectiveness of the scheme "reduced fertilis-

137 Stubble retention means that no tilling of any kind is performed in the autumn, such as ploughing or harrowing.
138 Letter from the Ministry of Agriculture to the Office of the Auditor General dated 4 May 2000.
139 Proposition no. 75 (1998–99) to the Storting *The Annual Agricultural Settlement for 1999*.

er intensity" for nitrogen was originally calculated have since been changed. According to the proposition, the values used in the calculations were thus not in keeping with what subsequent knowledge suggests.[140]

The tax on artificial fertiliser

The Ministry of the Environment and the Ministry of Agriculture do not agree in their assessment of the degree to which the environmental tax on artificial fertilisers constituted an effective tool. The Ministry of the Environment was in favour of the tax, while the Ministry of Agriculture believed the tax did not achieve its intended purpose.

The Ministry of the Environment claims that it is a dilemma that each environmental issue is studied separately when decisions are being made about environmental measures. In connection with the debate about the tax on artificial fertilisers, attention was constantly focused on the problem of nutrient enrichment, and the cost-effectiveness of the scheme was assessed exclusively in relation to this environmental problem. According to the Ministry, it would have been more useful to consider the tax on artificial fertilisers as a policy instrument that has positive effects in terms of reducing nutrient enrichment, emissions of greenhouse gases that deplete the ozone layer and emissions of ammonia that have an impact on local biodiversity.

In the audit interview, the Ministry of Agriculture stated that there was no isolated documentation of whether the tax on artificial fertilisers had had a positive impact in the form of reductions in the amount of fertiliser used. Even during the official study prior to the introduction of the tax, researchers were unable to demonstrate any certain effects of the measure. On the basis of economic theory, it would be reasonable to conclude that a marked increase in the level of duties on artificial fertilisers would reduce consumption. However, according to the Ministry, it is difficult to raise the level of duties when it is not certain that this will yield sufficient environmental impact. The reason for this is that other impacts, such as reduced crop yields, would mean that farmers would have to deploy alternative measures, such as buying fodder and cultivating other crops in order to compensate for reduced yields. Factors such as these mean that the overall environmental impact of raising tax levels is uncertain. Higher environmental taxes also affect the cost of using artificial fertilisers in general, as opposed to only penalising excessive use that can be proved to lead to nutrient loss.[141] The Ministry stated that no other country has yet found an optimum level for duties on artificial fertilisers that guarantees reductions in leakages of nitrogen and phosphorus from agriculture.

---

140 Proposition no. 61 (1994–95) to the Storting *The Annual Agricultural Settlement for 1995*.
141 Letter from the Ministry of Agriculture to the Office of the Auditor General dated 4 May 2000.

The Ministry of the Environment stated that the tax on artificial fertilisers was introduced in Norway in 1989. When it was introduced, there was agreement about it being set at 50 per cent, i.e. approximately NOK 3 per kg of nitrogen. In the final phase, a compromise was reached and the tax was reduced to roughly NOK 1 per kg of nitrogen. The Ministry of the Environment claimed that one *krone* per kilogram of nitrogen was too low to have any useful effect. The tax on artificial fertilisers was subsequently removed completely, meaning the government no longer has the possibility to raise the tax level as a means to achieve reductions in nitrogen discharges. The tax on artificial fertilisers was lifted in connection with the Annual Agricultural Settlement for 1999.[142]

The environmental tax on artificial fertilisers was also discussed by the commission that was appointed to assess environmental policy instruments. The commission stated that on the basis of standard economic theory, any environmental duty will necessarily trigger other measures that entail more efficient exploitation of nitrogen. The Policy Instrument Commission called this the *substitution effect* of green taxes as an environmental policy instrument. According to the Commission, the use of the "tax on nitrogen in artificial fertilisers" as an instrument to implement environmental policy would also encourage the use of all the other measures assessed in the analysis of the measures whose aim is to reduce nitrogen run-off from soil. These kinds of general economic instruments are cost-effective up to a level far higher than the level of the tax itself, according to the Policy Instrument Commission. However, increases in green tax levels also affect the relations of distribution and must therefore be considered together with the total transfers to and the economy of the individual agricultural production units.[143]

The use of fertilisers

Adapting the application of fertilisers to the needs of the crops is an effective way to reduce pollution from agriculture. Considerable resources have been invested in this scheme, for example in connection with the introduction of mandatory fertiliser plans, studies to predict the crops' need for nitrogen in the growing season, etc.[144] On 1 January 1998, a scheme was introduced whereby every farm had to submit a fertiliser plan. In 1997, approximately 70 % of the agricultural land in use in Norway was being operated according to fertiliser plans, according to the proposition to the Storting in connection with the Annual Agricultural

142 Proposition no. 75 (1998–99) to the Storting *The Annual Agricultural Settlement for 1999*.
143 Official Norwegian Reports (NOU) 1995:4 *Policy instruments in environmental policy*.
144 Report no. 99/12, Statistics Norway: Impact assessment in agriculture 1999.

Settlement for 1998.[145] In the audit interview, the Ministry of Agriculture said that the scientific foundation for the introduction of the duty to prepare fertiliser plans was documented in trials and field studies.

Statistics Norway's "impact assessment in agriculture" charted the turnover of artificial fertilisers and the spread of effective substances from manure. An *overall* representation of the volume of nitrogen lost from artificial fertilisers sold and the effective nitrogen that spread from manure indicated that there were small variations in the period 1989 to 1997. There was a slight decrease in the volume of phosphorus input in this period.[146]

The Ministry of the Environment informed the auditors that nowadays it is possible to achieve better results using manure than was previously possible, because there have been major advances in the technology. Requirements can be set regarding technology, and there are now technological solutions that prevent much of the run-off to water and losses to air. The current technology includes high pressure nozzles that dilute and inject livestock manure straight into the ground. In Sweden, the authorities have specified that this technology must be used, and investment schemes have been set up to help farmers buy the technology. The Ministry of the Environment and the Ministry of Agriculture continuously assess policy instruments to increase the use of this kind of technology.

In principle, the Ministry of the Environment can take the initiative to implement any environmental measures it deems appropriate, also in the agricultural sector. The manure regulations are currently founded on both the Pollution Control Act and the Land Act and constitute the main regulation for which the Ministry of the Environment has a direct responsibility in its collaboration with the agricultural sector. Work is currently in progress to transfer responsibility for the regulation to the sector it concerns. In addition, several regulations are now being co-ordinated and greater authority is being delegated to the municipalities. The Ministry of the Environment wants to transfer responsibility to the relevant sectors and delegate authority to the municipalities, since the environmental problems are often of a local nature.

Scientific uncertainty

The Ministry of Agriculture confirmed to the Office of the Auditor General that there was a lack of acceptable and effective measures in

145 Proposition no. 67 (1997–98*The Annual Agricultural Settlement for 1998*.
146 Report no. 99/12, Statistics Norway: Impact assessment in agriculture 1999.

agriculture to reduce discharges of nitrogen. This has contributed to Norway's failure to meet the targets for reduction of nitrogen inputs to the vulnerable area of the North Sea. According to the Ministry, part of the reason for this is that the results were overrated and the methods of calculation were unsure when the measures were assessed. The Storting has been informed about this uncertainty in the original assessments.[147] There was also uncertainty concerning the circumstances in 1985. According to the Ministry, the lack of factual information about the situation when the measures were initially analysed is another reason why the measures were not as effective as predicted. According to the Ministry, research is still being conducted into the development of effective measures to reduce nitrogen losses from agriculture. In addition, new measures have been implemented because some of the existing measures were not effective. The new measures that have been implemented include the use of sedimentation ponds, sodded waterways, vegetation strips, fertiliser plans, prognoses about nitrogen in the soil in the spring and environmental improvements in cereal-growing areas. The more successful measures, such as alternative tilling and cultivation methods and use of cover crops, have been developed further.

There was also scientific uncertainty regarding the quantitative connection between the amount of nutrients (the "input dose") and the environmental impact in the marine environment (the "response"). The Storting has been informed that against this background there is a need for continued research into dose–response relations. New administrative tools will also have to be developed to enable the authorities to make informed judgments about what constitute the best possible measures, according to the report submitted to the Storting.[148] In the audit interview, the Ministry of the Environment stated that no further overall assessment of the measures and instruments to reduce nitrogen discharges has been undertaken, as was proposed in the report to the Storting. This assessment has been postponed for two reasons. On the one hand, there have been disputes regarding the financing of the project, in terms of whether the agricultural authorities or the environmental authorities should bear the costs. On the other hand, the authorities have been waiting for the publication of the sectoral environmental plan of action that will shed useful light on this question.

The Ministry of Agriculture confirmed that the previous assessments of environmental impact and cost-effectiveness that have been conducted to

147 Cf. Report no. 64 (1991–92) to the Storting *Concerning Norway's implementation of the North Sea Declarations.*
148 Report no. 58 (1996–97) to the Storting *Environmental Policy for a Sustainable Development*.

ascertain the relationship between reduced application of fertiliser and nitrogen run-off (dose–response relations) were over-optimistic. This uncertainty was also discussed in the analysis of the measures performed by the Norwegian Pollution Control Authority and the report that was submitted to the Storting.[149] The Ministry of Agriculture also informed the auditors that field studies have since been performed that provide more useful information about the relations between input dose and response.

4.4.2.3 Technical measures aimed at point source discharges

A study was conducted to ascertain the scope of technical environmental measures in agriculture that were aimed at reducing point source discharges. This grant scheme was implemented in autumn 1988 and ran until 1997. The number of plans for measures that were approved increased from 1989 to 1991 and then declined again until 1996. From 1996 to 1997, there was a 33 % increase in the number of plans that were approved.[150]

4.4.2.4 Pesticides

The Ministry of Agriculture stated that in connection with Norway's efforts to comply with the targets laid down in the OSPAR Convention and the North Sea Declarations, it was decided to ban the use of certain hazardous substances. In the agricultural sector, this did not entail any major challenges, as many of these hazardous substances had already been or were in the process of being taken out of use. In addition, a number of monitoring programmes were carried out on pesticides, which, according to the Ministry, did not find that there was any input of pesticides from agriculture to the rivers that drain into the vulnerable area in the North Sea.

The Ministry stated that the plan of action to reduce risks entailed by use of pesticides was not introduced with the express purpose of contributing to Norway's compliance with the OSPAR Convention, but rather because it is a generally advantageous means to reduce emissions of hazardous substances to bodies of water. According to the Ministry, the most harmful hazardous substances have already been banned, but it is difficult to remove all the hazardous substances from pesticides. The plan of action to reduce risks entailed by use of pesticides applies to the period 1998 to 2002. The plan of action was drafted partly in response to Proposition no. 1 (1998–99) to the Storting, in which the Ministry of Agriculture

149 Report no. 64 (1991–92) to the Storting *Concerning Norway's implementation of the North Sea Declarations.*
150 Report no. 99/12, Statistics Norway: Impact assessment in agriculture 1999.

informed the Storting that the Norwegian Crop Research Institute had concluded that there was a potential for reductions in and adaptation of the use of pesticides, without this having unacceptable consequences for agriculture.

One policy instrument that was introduced to promote compliance with the plan of action is the tax on pesticides. The environmental tax system was changed from 1 March 1999 as a result of the plan of action to reduce risks entailed by use of pesticides. This tax reform entailed that pesticides were now grouped into classes for taxation, according to their inherent properties and exposure load. As a result of the reform, the tax on pesticides, which was previously based on turnover values, was now to be calculated on the basis of standardised acreage doses differentiated according to the hazard that the substances pose to human health and the environment. In order to ensure that the tax has sufficient impact in relation to the targets, the level of the tax will be assessed each year in connection with the annual budget propositions.[151] The Annual Agricultural Settlement for 1998 presupposed that compensation would be provided for the entire duty via the Agricultural Agreement from 1999 on.[152] The sales figures have revealed that there has been an increase in sales of pesticides. In the report published by Statistics Norway, it is stated that total consumption of pesticides increased considerably from 1997 to 1998. Turnover rose from 755 tonnes to 951 tonnes. According to the report, this increase is due to farmers stocking up in anticipation of the reforms in the tax system in 1999.

According to the Ministry of Agriculture, the Ministry of the Environment reported to the OSPAR Commission that the measures related to pesticides have been implemented. The current plan of action thus has little *legal relevance* to the earlier decisions in the OSPAR Convention to ban certain hazardous substances.

4.4.3 Monitoring and reactions to non-compliance

The requirement in the OSPAR Convention for the provision of a monitoring system to assess compliance with authorisations and regulations is implemented in the agricultural sector by means of Acts of law and regulations.[153] In the agricultural sector, regulations are drafted with specific monitoring requirements for each of the environmental measures. The

151 Proposition no. 1 (1999–2000) to the Storting, the Ministry of Agriculture's budget proposition.
152 Proposition no. 67 (1997–98) to the Storting *The Annual Agricultural Settlement for 1998* and Proposition no. 1 (1999–2000) to the Storting, the Ministry of Agriculture's budget proposition.
153 Cf. sections 3.2.3 and 3.2.4 above.

authorities' administration of this system provides some indication of the degree to which environmental measures and policy instruments have been implemented as intended.

The Ministry of Agriculture stated that it has not laid down special conditions regarding monitoring of measures to reduce pollution from hazardous substances and nutrients in the light of the OSPAR Convention alone, but rather that the existing routines for monitoring and reporting already provide for this. Each individual farmer is responsible for preventing discharges from point sources, and in the event of non-compliance with the regulations, the matter is pursued legally under the provisions of the Pollution Control Act.

In the agricultural sector, there are two types of inspections. Firstly, routine inspections are carried out on approximately 5 % of the farms in Norway each year. Secondly, the information provided in applications is verified, and farmers must be able to document that they have prepared the necessary plans and that these are satisfactory.[154]

Alternative tilling and cultivation methods

Approximately 20 % of the applications for the grant for alternative tilling and cultivation methods are subject to special inspection. If errors are found, twice the amount of grant funding allocated that is connected to the errors shall be deducted. Funds shall be confiscated even if the applicant withdraws his/her application.[155]

There was a gradual increase in the amount of grant funds awarded under the scheme for alternative tilling and cultivation methods from just below NOK 82 million in 1995 to a little over NOK 98 million in 1998. There was some variation in the use of sanctions in the form of confiscated funds in the audit period, with an overall drop from approx. NOK 380 000 in 1995 to approx. NOK 194 000 in 1998. As a percentage, this corresponds to approx. 0.5 % deductions from grants in 1995 and approx. 0.2 % deductions in 1998.

The Office of the Auditor General's survey of the municipalities charted the scope of inspections and monitoring activities and the number of recorded breaches of the conditions laid down in the regulations relating to alternative tilling and cultivation methods. Table 15 demonstrates that

154 Letter from the Ministry of the Environment to the Office of the Auditor General dated 4 May 2000.
155 Letter from the Ministry of the Environment to the Office of the Auditor General dated 3 September 1999.

the scope of instances of non-compliance with the regulations relating to alternative tilling and cultivation methods was relatively low in the period of study, but that the number of breaches rose to 7.9 % in 1998.

Table 15 The number of inspections and violations – alternative tilling and cultivation methods, 1995 to 1998

Year	*No. of inspections*	*Violations / non-compliance No. of instances detected and percentage*	
1995	2218	98	4.4 %
1996	2158	63	2.9 %
1997	2342	83	3.5 %
1998	2262	179	7.9 %

Source: The Office of the Auditor General's questionnaire survey of the municipalities, 1999.

Environmental improvements in cereal-growing areas

Table 16 demonstrates that there was an increase from 16 payments made when the scheme was introduced in 1996 to 286 in 1997 and 245 in 1998. The scheme was first monitored in 1997, when 35 applicants were subject to inspection. Seven instances of non-compliance with conditions in the regulations were detected. Funds were deducted in all seven cases in 1997. In 1998, 33 recipients of grants were inspected, of which five were found to be in contravention of conditions and three had funds deducted from the grant.

Table 16 The number of inspections, violations and sanctions – environmental improvements in cereal-growing areas, 1996 to 1998

Year	*The number of grants paid out*	*The number of inspections performed*	*Number and percentage of registered violations*		*The number of deductions in grants*
1996	16	-	-	-	-
1997	286	35	7	20 %	7
1998	245	33	5	15 %	3

Source: The Office of the Auditor General's questionnaire survey of the county governors, 1999.

Sufficient spreading area for manure

Inspections are carried out on the basis of the application for the agricultural production subsidy. All farming units that apply for the grant are subject to inspection, which corresponds to almost all the farms in Norway that have livestock. The sanctions that are used if farms are found to have insufficient spreading area are NOK 4000 per manure-producing unit, which corresponds to roughly NOK 1000 per 0.1 hectare too little.[156] The figures show that there was a decrease in the number of farms in Norway that did not have sufficient spreading area for manure from 477 in 1996 to 347 in 1998. In the "North Sea counties", the number of farms that had insufficient spreading area for manure remained relatively stabile throughout the period, cf. table 17.

Table 17 The number of farms with insufficient spreading area for manure, for the whole country and for the North Sea counties, 1996 to 1998

Year	*Whole country*	*The North Sea counties*
1996	477	65
1997	312	61
1998	346	64

Source: The Ministry of Agriculture.

Table 18 below reveals that there was a marked decline in the number of inspections from 1995 (1124) to 1998 (207). At the same time, there was an increase in the number of violations of regulatory conditions that were detected from approx. 17 % in 1995 to approx. 34 % in 1997. This figure then fell to 29 % in 1998. Inspections of manure storage facilities are generally undertaken when there are grounds to suspect non-compliance. The percentage of violations is therefore not representative of the general situation.[157] In respect of use of sanctions, there was a decrease in the use of the mildest forms of reaction, but an increase in the use of harsher forms of sanctions, such as pollution fines and criminal charges, in the period as a whole.

156 Letter from the Ministry of Agriculture to the Office of the Auditor General dated 3 September 1999.
157 Letter from the Ministry of Agriculture to the Office of the Auditor General dated 4 May 2000.

Table 18 The number of inspections, violations and reactions/sanctions – manure storage facilities, 1995 to 1998

Year	*No. of inspections performed*	*Violations/non-compliance – number and percentage*		*Written order to take corrective action*	*Pollution fines*	*Criminal charges*
1995	1124	188	16.7 %	161	5	3
1996	763	234	30.7 %	127	13	7
1997	323	111	34.4 %	69	12	18
1998	207	60	29 %	56	16	10

Source: The Office of the Auditor General's questionnaire survey of the county governors, 1999.

Fertiliser plans

The regulation relating to fertiliser plans came into force on 1 January 1998, and as of the 1998 growing season it became obligatory for all farms to have a fertiliser management plan. All farms that apply for grants are monitored by means of the details provided by the applicant. In respect of the requirement for fertiliser plans, the ordinary five-percent rule is applied in connection with inspections. Monitoring includes verifying that the particulars provided are correct and that there is documentation that a fertiliser plan has been prepared. The size of the deduction from the agricultural production subsidy varies according to the size of the holding. The smallest deduction is for farms of less than 10 hectares, for which NOK 2000 is deducted in the event of contravention. The highest deduction is NOK 5000 for farms of more than 40 hectares.[158]

1998 was the first year in which money was deducted in connection with violations of the conditions for this scheme. Across the country, 2892 farms had funds deducted from their agricultural production subsidy for violations of requirements regarding fertiliser plans in 1998. Of these, 1509 farms were in the "North Sea counties". The municipalities stated that 3414 inspections were conducted in 1998, which revealed 444 instances of non-compliance, constituting 13 % non-compliance with the scheme.[159]

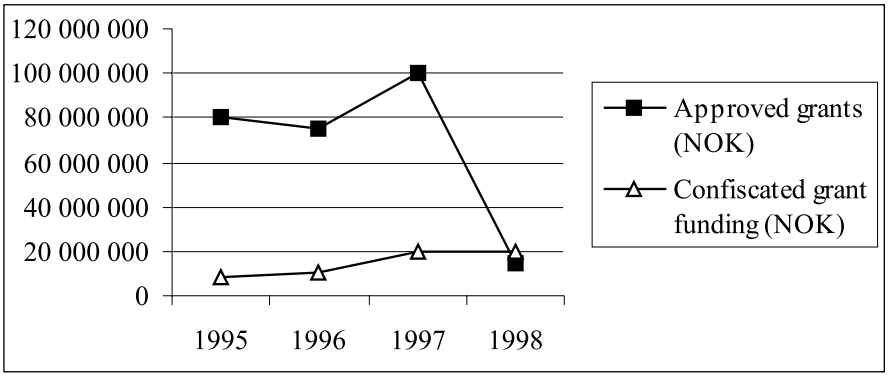
158 Letter from the Ministry of Agriculture to the Office of the Auditor General dated 3 September 1999.
159 Letter from the Ministry of Agriculture to the Office of the Auditor General dated 3 September 1999.

Support for environmental measures

The Ministry of Agriculture grants support for improvement of technical systems in agriculture by means of funds transferred via the Agricultural Agreement. Before the grant is calculated and paid out, the county governor monitors that the proposed system complies with the relevant plans. According to the Ministry of Agriculture, this ensures that errors and deficiencies are corrected before final approval of the system. The Ministry pointed out that considerable sums of money have been confiscated in connection with this scheme. This was primarily in connection with applications not being implemented because the farm no longer kept livestock and the requirement for improvement of manure storage facilities thus no longer applied.[160]

The graph below demonstrates an increase in the grant funds paid out from approx. NOK 80 million in 1995 to approx. NOK 100 million in 1997. The Ministry stated that some of the measures that had previously been covered by this scheme were transferred to the Rural Development Fund in 1998, and that this explains the decrease in payments from over NOK 100 million in 1997 to less than NOK 15 million in 1998. In respect of confiscated grant funds, there was also an increase in the audit period as a whole, from approx. NOK 8 million in 1995 to approx. 20 million in 1998. The amount of government grant funding that was confiscated in 1998 exceeds the amount paid out by approx. NOK 5.5 million that year. The Ministry stated that this was due to a backlog in confiscated appropriations in 1998, because the users have a period of three years to implement environmental measures for which they receive funding, cf. figure 7.

Figure 7 Grant funds paid out and confiscated for environmental measures in agriculture, 1995 to 1998



Source: The Ministry of Agriculture.

160 Letter from the Ministry of Agriculture to the Office of the Auditor General dated 3 September 1999.

Table 19 reveals an overall decrease in the number of inspections performed in the period. The degree of non-compliance with the regulations also decreased correspondingly in the period 1995 to 1998.

Table 19 The number of inspections and violations of the regulations relating to environmental measures, 1995 to 1998

Year	*The number of inspections*	*Violations/non-compliance – number and percentage*	
1995	598	77	12.9 %
1996	724	111	15.3 %
1997	382	21	5.5 %
1998	312	17	5.4 %

Source: The Office of the Auditor General's questionnaire survey of the county governors, 1999.

The county governors and the municipalities are responsible for monitoring and inspection in the agricultural sector. The auditors investigated the county governors' assessment of the effectiveness of the policy instruments related to inspections and sanctions. The majority (12) reported that they found the instruments fairly effective and four stated that they were effective. The county governors in two counties stated that the policy instruments were not very effective, but none claimed that the instruments were ineffective.

In respect of the municipalities' perception of the policy instruments available to them, a large majority stated that they were satisfied with the instruments they administered. Approx. 58 % said that the instruments were fairly effective, and approx. 30 % said they were effective. Approx. 9 % felt that the policy instruments were not very effective, while a little over 2 % said they were ineffective.

Pesticides

The Norwegian Agricultural Inspection Service keeps records of the annual turnover of pesticides in terms of the number of kilograms of active substances sold for substances that have been approved. It also keeps records of sales of substances that have not been approved. According to information provided by the Agricultural Inspection Service, there have been no unapproved sales of substances on the "North Sea list" since 1995.[161]

161 Letter from the Norwegian Agricultural Inspection Service to the Ministry of Agriculture dated 1 September 1999.

4.4.4 Reporting systems

The Ministry of Agriculture confirmed that a number of performance monitoring systems have been developed in connection with environmental measures in the agricultural sector:

- The Norwegian Environmental Monitoring Programme (JOVÅ) registers emissions of pesticides, heavy metals and nutrients from agriculture. The findings of the Norwegian Environmental Monitoring Programme are presented in a report that the Ministry of Agriculture publishes each year in collaboration with the Ministry of the Environment and the Norwegian Pollution Control Authority.[162]
- Annual assessments of impacts in agriculture are carried out by Statistics Norway, which chart the implementation of measures against pollution in agriculture. The Ministry stated that in collaboration with the Ministry of the Environment, a system has also been developed to monitor performance of measures that have been implemented in connection with environmental work in agriculture. The results are presented in the report "Impact Assessment in Agriculture" published each year by Statistics Norway.

A number of different research institutions have been commissioned to track and record developments in the environmental impacts of agriculture. The Ministry of Agriculture stated that the Norwegian Institute for Water Research (NIVA) undertook a major analysis of nutrient enrichment, water quality and changes in water quality in agriculture in 1997.[163] In addition, on commission from the Ministry of Agriculture, the Ministry of the Environment and the Norwegian Pollution Control Authority, the Centre for Soil and Environmental Research and the Norwegian Crop Research Institute monitored the performance of various measures and submitted a report about the Environmental Monitoring Programme in Norway.

The County Governors Departments of Agriculture, the Norwegian Agricultural Inspection Service, the State Bank for Agriculture and the Norwegian Grain Corporation all submit annual reports to the Ministry of Agriculture. According to the Ministry, these reports contain information about the number of applications for grant funding and how many applicants received grants under the various schemes. The data from applications for the agricultural production subsidy and other financial support schemes administered by the Ministry of Agriculture are included in data

162 The Norwegian Environmental Monitoring Programme (JOVÅ) and impact assessment in agriculture 1997.

163 The Norwegian Environmental Monitoring Programme (JOVÅ)'s monitoring of water bodies that are affected by agriculture. Nutrient enrichment, water quality and changes in water quality.

processed by Statistics Norway in the annual impact assessment in agriculture. In addition, Statistics Norway gathers information each year about agricultural land use and the application of fertilisers etc. from a sample of agricultural operating units. These data are included in Statistics Norway's report "impact assessment in agriculture" and provide details about the status of and trends in the implementation of the environmental measures in agriculture.[164]

In the audit interview, the Ministry of Agriculture stated that its monitoring system is based on overall figures, such as Statistics Norway's impact assessment reports, and that reports shall be submitted for each individual environmental scheme or measure. The Ministry uses information provided by the performance reporting systems to adjust individual schemes in the event of deviation from the targets.

The county governors are responsible for monitoring tasks in connection with implementation of the environmental measures in the agricultural sector. The environmental measures in the agricultural sector have their legal basis in the Pollution Control Act, which is administered by the County Governors Departments of Environmental Affairs, and the Land Act, which is administered by the County Governors Departments of Agriculture. The environmental measures administered by the County Governors Departments of Agriculture are primarily voluntary schemes for which financial support can be applied. For this reason, there may be regional variation regarding whether voluntary schemes have been implemented or not. In addition, not all the measures are equally relevant in all parts of Norway, meaning there is also variation regarding whether the county authorities in the individual county report to the agricultural authorities or the pollution control authorities. All the county departments informed the Office of the Auditor General that they produce annual reports about their activities connected to the environmental measures in the agricultural sector. Ten stated that they report to the Ministry of Agriculture, one reports to the Norwegian Agricultural Inspection Service, 16 report to the Norwegian Pollution Control Authority and three stated that they report to other agencies.

The municipalities report about their activities related to their supervisory responsibilities by completing and returning standard inspection forms to their local County Department of Agriculture. According to the municipalities, approx. 86 % report once a year or more frequently (N = 344). Nine percent stated that they report less frequently than once a year, and approx. five percent stated that they never submit reports on their monitoring activities.

164 Report no. 99/12, Statistics Norway: Impact assessment in agriculture 1999.

Evaluations

The Ministry of Agriculture told the auditors that it undertakes evaluations of the measures that have been implemented to reduce emissions of hazardous substances and nutrients from agriculture. It is primarily grant schemes that are evaluated, but other measures are also evaluated. The Ministry contracts research institutes and other expert institutions to perform the evaluations. According to the Ministry, evaluations are performed according to need. The most recent evaluation of a scheme was performed in 1999 on the grant scheme "environmental improvements in cereal-growing areas". This evaluation concluded that the objectives of the scheme have largely been fulfilled, but that too many administrative resources have been invested in the implementation of the scheme.

4.5 Status

The County Department of Environmental Affairs has a special responsibility to implement and mediate information about central government environmental targets and measures within the county. This section contains a presentation of the county governors' performance of these tasks on the regional level and a discussion of the status of nutrient enrichment and emissions of hazardous substances.

4.5.1 Compliance on the county level

Table 20 below demonstrates that the number of county departments was fairly evenly divided with regard to their overview of run-off of nutrients across sectoral boundaries in the county. Nevertheless, it should be noted that half of the respondents stated that they had limited or little knowledge of the situation in their county; the other half stated that they had good or very good knowledge of the situation regarding emissions and run-off across the sectors within their county.

With regard to the environmental status of the bodies of water in the county, the majority (15) stated that they had good knowledge of the situation. A minority of three stated that they had limited or little knowledge of the water quality in the bodies of water in the county.

With regard to watercourses in sparsely populated areas, the county governors in a majority (13) of the counties stated that they had little knowledge of the environmental condition. A small minority (five) of the counties said they had good knowledge of the situation.

Table 20 Performance on the county level

	Very good	*Fairly good*	*Limited*	*Little*
The county governors' knowledge of emissions and run-off of nutrients across sectoral boundaries in the county	3	6	8	1
The county governors' knowledge of the water quality in the water bodies in the county	3	12	2	1
The county governors' knowledge of the water quality in watercourses in sparsely populated areas	2	3	7	6

Source: The Office of the Auditor General's questionnaire survey of the county governors, 1999 (N=18).

Although there was variation between the counties with regard to their awareness of the current state of the environment and emissions and run-off of nutrients, all the counties except one compiled an environmental status report.

4.5.2 Nutrient enrichment

The Storting has been informed about the status regarding the degree of achievement of the targets for reductions in emissions of phosphorus and nitrogen.[165] It is stated in the Report to the Storting that inputs of phosphorus in the area from the Swedish border to Lindesnes have been reduced by a total of 49 % since 1985, meaning that the reduction target for phosphorus has been met. Inputs of nitrogen in the area from the Swedish border to Strømstangen lighthouse and the inner Oslo fjord have been reduced by a total of 18 % since 1985. Thus, the degree of achievement of targets for nitrogen was considerably lower than expected. According to the Ministry of the Environment, the reason that the targets for reduction of nitrogen emissions have not been met is the uncertainty associated with the need to remove nitrogen and an unwillingness among the municipalities to bear the costs of nitrogen removal in their waste water treatment facilities. The Ministry pointed out that there is still a national target to reduce total inputs of nitrogen by 50 %, but also referred to the fact

165 Report no. 8 (1999–2000) to the Storting *The government's environmental policy and the state of the environment in Norway*.

that a new analysis of the measures is going to be performed in order to re-evaluate both the target and the measures. The time limit for the objective of a 50 % reduction in emissions of nitrogen has now been set to 2005, but the Ministry underlined that there is still a great deal of uncertainty as to whether this can be done.

Tables 21, 22 and 23 show reductions in inputs of nitrogen and phosphorus to the vulnerable area[166] from the three sectors as a percentage compared with the baseline year 1985. The sector targets for reductions of phosphorus and nitrogen have been given in parentheses.

Table 21 Status of emissions of phosphorus and nitrogen, industry, 1995 to 1998

Year	*Phosphorus (50 %)*	*Nitrogen (75 %)*
	Status	Status
1995	41 %	66 %
1996	38 %	63 %
1997	40 %	67 %
1998	20 %	71 %

Sources: Budget propositions from the Ministry of the Environment for 1994 to 1999 and the TEOTIL reports for 1996 to 1998.

Table 22 Status of emissions of phosphorus and nitrogen, waste water, 1995 to 1998

Year	*Phosphorus (54 %)*	*Nitrogen (44 %)*
	Status	Status
1995	50 %	-2 %
1996	53 %	1 %
1997	60 %	11 %
1998	61 %	13 %

Sources: Budget propositions from the Ministry of the Environment for 1994 to 1999 and the TEOTIL reports for 1996 to 1998.

166 In this context, the “vulnerable area” is the Norwegian coastline from the Swedish border to Lindesnes. This area has been defined as a problem area in the North Sea Declarations and in the OSPAR Recommendation no. 88/2. (Source: “Nutrient enrichment in Norwegian coastal areas 1997, calculated using the input model TEOTIL”, published by the Norwegian Pollution Control Authority and the Norwegian Institute for Water Research).

Table 23 Status of emissions of phosphorus and nitrogen, agriculture, 1995 to 1996

Year	*Phosphorus (40 %)*	*Nitrogen (44 %)*
	Status	Status
1995 1996	27 % 26 %	19 % - %

Source: Budget propositions from the Ministry of the Environment for 1994 to 1999.

Emissions of nitrogen from agriculture have remained fairly stabile since 1994. For this reason, the data have not been updated since 1996.[167] There is also some uncertainty connected to the model that was used to chart the total discharges of nutrients from agriculture to the vulnerable area of the North Sea.[168] The budget propositions submitted by the Ministry of the Environment for the years 1994 to 2000 do not mention the status of reductions of nitrogen inputs from 1996 to 1998 or the status of reductions of phosphorus emissions in 1997 and 1998 in the three sectors.

New analysis of the measures

The Ministry of the Environment stated in the audit interview that in 2000 it shall be decided whether a new analysis of the measures to eliminate inputs of nitrogen is to be performed. The perceived need for a new analysis of the measures has been triggered by the ongoing discussion concerning removal of nitrogen. A new analysis of the measures would make a critical assessment of the target that has been set to reduce nitrogen discharges (by 50 % based on the 1985 figures). Several countries have had problems fulfilling this target. In addition, the new analysis would assess whether the current distribution of measures between the various different sectors is effective. Since the 1992 analysis of the measures, EU directives have come to play a much more dominant role in Norway, and these directives lay down concrete requirements regarding agricultural practices. The Ministry stated that no evaluations have been performed of the measures that were implemented against the background of the 1992 analysis of measures, and that this kind of evaluation would also be included in a new analysis of the measures.

167 Report no. 8 (1999–2000) to the Storting *The government's environmental policy and the state of the environment in Norway*.
168 Letter from the Ministry of the Environment to the Office of the Auditor General dated 16 May 2000.

4.5.3 Hazardous substances

Most of the reductions that have been achieved for discharges of hazardous substances are the result of measures within the industrial sector. Norway has largely met the quantitive reduction targets that were set in the North Sea Declarations and national decisions on a number of specified hazardous substances. Nevertheless, these reductions in emissions are not sufficient.[169]

The Storting has been informed about the developments in discharges of hazardous substances to water.[170] The report shows that from 1985 to 1990, there was a marked decrease in emissions of hazardous substances to water. From 1990 until 1995, emissions continued to decrease, but at a slower rate, and from 1996 to 1997, there was a slight increase in the relative emissions. The various chemicals have very different properties and pose different risks to the environment, as well as there being large variations in the size of emissions of the various different substances. In order to illustrate these factors more clearly, the substances have been weighted according to risk and size of emissions.

The work to operationalise the objectives in the field of hazardous substances is being carried out within the OSPAR collaboration. In this context, the Norwegian Pollution Control Authority in consultation with the other Nordic countries has derived criteria for undesirable properties that shall form the basis for the future work on hazardous substances within OSPAR.[171]

In recent years, the Norwegian Pollution Control Authority has increasingly concentrated its monitoring activities on chemicals that are harmful to human health or the environment. Monitoring of hazardous chemicals was expanded by two fulltime equivalents in 1998, and there are currently plans to increase it by another three fulltime equivalents. At the same time, greater importance is being attached to chemicals that are harmful to human health or the environment in the traditional monitoring of pollution.[172]

---

169 Proposition no. 1 (1996–97) to the Storting, the Ministry of the Environment's budget proposition.

170 Cf. Report no. 8 (1999–2000) to the Storting *The government's environmental policy and the state of the environment in Norway*.

171 Report no. 8 (1999–2000) to the Storting *The government's environmental policy and the state of the environment in Norway*.

172 "How to make monitoring and inspections a more forceful environmental policy instrument in connection with chemicals – Plan for 1999 to 2003" (the Norwegian Pollution Control Authority, March 1999).

5. The auditors' judgements

Norway has ratified the OSPAR Convention, the objective of which is to prevent and eliminate pollution in the north-east Atlantic. In this context, Norway has committed itself to halving discharges of phosphorus and nitrogen to this maritime area in the period 1985 to 1995. The audit has revealed that these targets have been extended, as they proved difficult to fulfil. Norway has achieved the quantitative targets for reductions of discharges of hazardous substances, but there is still a need for further reductions in order to attain the goal of ceasing all inputs of hazardous substances within one generation.

The audit focused on the degree to which the government administration's choice of measures and policy instruments helped to reduce emissions of phosphorus, nitrogen and hazardous substances to the north-east Atlantic. The audit revealed that there are grounds to query whether the authorities in industry, waste water management and agriculture have selected the most appropriate combination of policy instruments to implement the environmental measures.

5.1 Compliance in the industrial sector

In connection with implementation of environmental measures, the OSPAR Convention recommends that the Contracting Parties develop systems to monitor that polluting enterprises obey the instructions they are given. One of the purposes of these monitoring systems is to have a preventive effect and ensure a high degree of compliance with the environmental requirements that apply to polluters. In the industrial sector, an extensive monitoring system has been established, but despite this, it does not appear that the authorities' reactions to violations of conditions in discharge permits were sufficient to reduce the scope of breaches in the period 1995 to 1998.

The pollution reports submitted by companies to the Norwegian Pollution Control Authority demonstrated that each year, an average of 57 % of the discharge permits were violated. The percentage of violations of the conditions in discharge permits that were detected by the inspections performed by the authorities was approx. 40 % in 1997 and 1998. The figures were also high for violations of the requirements pursuant to the internal control regulations – approx. 60 % in 1997 and approx. 45 % in 1998. The relatively high figure for 1997 is probably due to the introduc-

tion of a new internal control regulation with more stringent requirements.

The monitoring system consists of two main parts: the *companies'* monitoring of their own activities and submission of pollution reports and the *authorities'* monitoring of the companies. Getting companies to monitor and report on their own activities is an important element of the monitoring system. It is therefore necessary to encourage the companies to report any non-compliance with requirements and implement the measures necessary to rectify the matter themselves. Nevertheless, the authorities must react when instances of non-compliance are detected, and there is reason to query whether the forms of reaction currently used are effective in terms of preventing violations. Very harsh reactions on the part of the authorities may lead to the companies refraining from reporting instances of non-compliance, but mild reactions will not always have a sufficiently preventive effect. It ought therefore to be assessed whether this contradiction within the monitoring system requires more follow up by the authorities.

In the industrial sector, it was found that predominantly mild forms of sanctions were used: most commonly, written orders to rectify the matter. Pollution fines and criminal charges were not used as frequently, and there was substantial variation from year to year. The Norwegian Pollution Control Authority believes that its spot checks and feedback it has received from companies indicate that written orders are an effective form of reaction. The fact that percentage of violations remained relatively stabile at a high level nevertheless means that it can be queried whether the harsher forms of sanctions ought to be used more frequently as the initial form of reaction. It should be assessed whether this would have a greater preventive effect in the long term.

The consistently high level of contravention of conditions in discharge permits in the industrial sector suggests that the authorities ought to consider introducing a more co-ordinated and varied combination of legal, economic and pedagogical policy instruments. The audit revealed that legal remedies were the most frequently used type of instrument in the industrial sector, followed by economic sanctions; whereas pedagogical instruments such as dissemination of information and knowledge were seldom used. Dissemination of knowledge might be extremely effective as a preventive measure and would contribute to companies being more easily able to satisfy the environmental requirements that have been set. The Norwegian Pollution Control Authority stated that it was cautious about informing companies about potentially cleaner technology, pollutant abatement systems, initiatives to stimulate better environmental per-

formance and changes in regulations and penal rules for fear of being held responsible for the choice companies subsequently made. Although the OSPAR Convention specifically recommends provision of information as a means to spread knowledge about best environmental practice, this instrument does not appear to have been used to any great extent.

A dedicated administrative system, INKOSYS, has been developed to register environmental performance in the industrial sector, one of the purposes of which is to assist the authorities in their overall strategic management and control and their supervision of the measures that are implemented. The audit revealed that for the most part INKOSYS was being used as intended, but that there were a number of weaknesses in the design and user interface. A majority of the county governors stated that they were not satisfied with the system in terms of user-friendliness, the user manual and the support and training provided. Because the user interface is not particularly intuitive, this may increase the risk of inefficiency, registration errors in the system and consequently inadequate control and monitoring on the part of the superior authorities. It is crucial that the user groups of the INKOSYS database find the system easily accessible if the registration of data is to be efficient and useful. The Norwegian Pollution Control Authority ought therefore ascertain what changes are necessary to ensure that the system is as intuitive and useful as possible.

5.2 Compliance in the waste water treatment sector

The county governors monitor the municipalities in their capacity as *polluters*, whereas the municipalities as the local *pollution control authority* monitor private waste water treatment facilities. The audit revealed that the municipalities did not assume sufficient environmental responsibility in either of their roles: neither when subject to environmental requirements from the county governor as the owner of sewage treatment installations, nor in their capacity as a local pollution control authority.

The county governors' monitoring of municipal waste water treatment plants revealed relatively many instances of violation of the provisions. As recently as in 1998, 45 % of the municipalities had still not finished developing their internal control systems. A clear majority (14 out of 18) of the county governors concluded that the municipalities did not have a fully satisfactory internal control system. Further, a significant number of the inspections revealed breaches of the pollution requirements. In 1997, for example, it was discovered that requirements had been violated in 85 % of cases. In 1998, this figure had sunk to 55 %.

The audit also revealed that a majority (57 %) of the municipalities did not perform the operational inspections on non-municipal waste water treatment plants that they as the pollution control authority are obligated to perform pursuant to the regulations. Since discharges from private sewage facilities often represent a relatively large part of the total run-off of nutrients to water, it is difficult to justify so many municipalities not performing these mandatory inspections. In this area, then, it does not appear that the municipalities adequately assumed the responsibilities with which they had been charged as the local pollution control authority.

A new regulation, which will come into force on 1 January 2001, delegates greater responsibility to the municipalities in the waste water treatment sector. Under the new regulation, the municipalities shall issue discharge permits and monitor waste water treatment plants serving up to 1000 person equivalents (p.e.). Compared with the current provisions, under which the municipalities have this authority for facilities up to 25 p.e., this represents a marked increase in the municipalities' responsibilities as a pollution control authority. In light of the inadequacy of the monitoring activities performed by the municipalities, the county governors must take active steps to ensure that the municipalities perform their monitoring tasks in a sound and appropriate way in the future.

According to the findings of the audit, the mildest form of reaction to contravention of requirements, a written order to correct the non-compliance, was used most frequently. Pollution fines were also used, but to a lesser degree, and there was a great deal of variation both between the counties and from year to year. For example, in 1998 fines were imposed in 20 cases in one county, whereas no pollution fines were imposed in any of the other counties. None of the county governors reported breaches of environmental requirements to the police during the four-year audit period. The Ministry of the Environment stated that monitoring and sanctioning the municipalities as polluters entails a number of challenges for the central government in terms of governance. However, against the backdrop of the large number of breaches of requirements in the waste water treatment sector, importance should be attached to developing policy instruments that ensure greater compliance with the environmental requirements to which the municipalities are subject.

A key factor in connection with water pollution is that pollution problems often manifest themselves in a different area to the source of the inputs. For example, discharges from sparsely populated areas may prevent municipalities further downstream from attaining their targets. For this reason, the county governor is charged with charting the state of the environment in sparsely populated areas and communicating to municipalities

that are the source of pollution that measures must be implemented. However, the audit revealed that over half of the county governors that responded (9 out of 17) seldom intervened when municipalities had excessive emissions from sparsely populated areas. There are therefore grounds to query whether the county authorities ought to take more active steps in their co-ordinating responsibilities across municipal boundaries in order to ensure that downstream municipalities are also able to achieve their targets.

The database SESAM has been established in the waste water treatment sector to promote general control and monitoring. SESAM had a number of problems in the start-up phase, partly because the system was difficult to use, with the result that the municipalities did not report all the results they were supposed to in 1998. According to the Office of the Auditor General's investigations, the county governors are generally satisfied with the usability of the system today.

5.3 Compliance in the agricultural sector

The audit revealed that some of the environmental measures in the agricultural sector were implemented only to a minor extent in areas where the needs were greatest. For example, fewer measures to introduce alternative tilling and cultivation methods were implemented in those areas of Norway where water drains into the "vulnerable" part of the North Sea than in the rest of the country. The percentage of cereal-growing land that was not worked in any way in the autumn was 32 % for nitrogen and 34.6 % for phosphorus in the "vulnerable" area, which is below the national average of 36.4 %.

The audit also revealed that most of the grant for alternative tilling and cultivation methods (approx. 58 %) did not go to areas where the erosion risk was highest. The grant scheme was introduced in 1991, and since 1994 an average of NOK 93 million has been paid out each year in grants to implement these measures. A system has been developed in the agricultural sector to assess the environmental risk and categorises agricultural land as having low, moderate, high or very high erosion risk. In the regulation governing the grant scheme "alternative tilling and cultivation methods", it is presupposed that funds will primarily be granted to areas with a high risk of run-off. The municipalities process and decide applications for the grant for alternative tilling and cultivation methods, and there are grounds to query whether their current practice is in keeping with the objectives of the scheme and whether the municipalities base allocation of the grant funds on the criteria laid down in the regulation.

On the basis of this, it can be claimed that this grant scheme is not being administered with sufficient target orientation and that the Ministry of Agriculture ought to assess whether it is possible to achieve a more target-oriented application of the available means by co-ordinating the use of legal and economic policy instruments.

In the agricultural sector, the environmental measures are currently financed primarily by means of central government grants. It can be queried whether this is in keeping with the polluter pays principle as it is defined in the OSPAR Convention. A farmer receives reduced grant funding if the conditions for the grant are not sufficiently fulfilled. A more proactive application of the polluter pays principle might constitute an effective tool in the work to limit pollution from agriculture. There was a previous attempt to apply this principle in connection with the tax on artificial fertilisers, but this tax was lifted in connection with the Annual Agricultural Settlement for 1999.

A central guideline in the OSPAR Convention is that the measures that are implemented shall be based on the use of the best available techniques. In the agricultural sector, requirements can be set regarding how fertiliser is spread and to what extent. The audit revealed that there is manure-spreading technology available today that reduces the run-off of nutrients, but that the Ministry of Agriculture has not laid down requirements regarding the use of this technology. Run-off of nutrients in connection with the use of manure is often a significant source of nutrient enrichment in bodies of water. Since the run-off of nutrients still poses environmental challenges for Norwegian agriculture, the Ministry of Agriculture ought to assess requiring the use of the best available techniques in this area as a policy instrument in the work to reduce nutrient run-off from agriculture.

According to the OSPAR Convention, the Contracting Parties shall develop systems to ensure practical compliance with authorisations and regulations. In the agricultural sector, provisions are laid down concerning monitoring and inspections in the regulation that governs each individual scheme. The monitoring systems in the agricultural sector require that the information submitted as grounds for receiving grant funds shall be verified. The monitoring systems are thus largely financially motivated and are less focused on detecting non-compliance with the environmental requirements in the *practices* of individual farms.

The audit revealed that there were generally few violations of the conditions on the basis of which grant funds are allocated. This can be explained by the fact that the measures in the agricultural sector are

implemented using economic instruments that stimulate farmers to implement the measures.

Two performance monitoring systems have been developed in the agricultural sector that are intended to facilitate overall strategic management and control. There is the impact assessment in agriculture performed by Statistics Norway, which charts the degree of implementation of the environmental measures in agriculture. The other system is the Norwegian Environmental Monitoring Programme (JOVÅ), which charts losses of pesticides, heavy metals and nutrients. The audit indicated that there was uncertainty associated with the model that is used to register the total input of nutrients from the agricultural sector to the vulnerable area in the North Sea. As a result of this uncertainty, no data has been obtained for the run-off of phosphorus and nitrogen from the agricultural sector since 1996. This lack of up-to-date information about the environmental results achieved makes it difficult for the Ministry to adapt measures and policy instruments in the most appropriate way. Against this background, it can be queried whether the performance monitoring systems should be improved.

Appendix 1 List of Documents

A full list of referred and other relevant documents can be found in the Norwegian original to this text: Riksrevisjonen Dokument nr. 3:4 (2000-2001) Riksrevisjonens undersøkelse av Norges oppfølging av OSPAR-konvensjonen innen industri-, avløps og landbrukssektoren.