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Appendices

1. Letter from DGIS dated 8 October 1998, in which the Commission has been asked to submit an advisory review.

2. Letter from the Colombian Ministry of Transport dated 7 October 1998, in which the Commission has been asked to submit an advisory review.

3. Letter from DGIS dated 24 September 1999, in which the Commission has been asked to perform a site visit.

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6. Map of the area.

MAIN POINTS AND *RECOMMENDATIONS* O T IS PO T

At the time the Tidal inlet project was approved, two formal requirements had to be met, namely an environmental licence and a construction permit. Both contain preconditions. The compliance with and enforcement of these conditions was subject to review by relevant parties during the site visit of the Commission to Cartagena in October 1999.
Underneath, the Commission summarizes the main findings of this report, starting with **gene a se a i ns**, followed by observations related to the **en i n en a icence** and **c ns c i n pe i** .

The Commission remarks that the project after completion will be handed over formally to the Ministry of Transport (the client/owner). However, a decision is yet to be made to appoint the - agency/institute/organisation in Cartagena responsible for the management, operation and maintenance of the project.
The Commission re-emphazises that clarity on the institutional setting after project completion has to be provided, meaning that an authority has to be appointed before project completion.

The Commission remains concerned with respect to the lack of progress of the 'marine outfall' project (which is vital for the sustainability of the project at long term), due to economic and financial constraints. Also, the monitoring programme of the 'marine outfall' project could generate data relevant for the well functioning of the Tidal inlet. The Commission observes that all parties involved are well aware of this key issue.
The Commission wants to re-emphasize, because of the reasons mentioned above, that the timely implementation of the 'marine outfall' project remains very urgent.

The preconditions of the **en i n en a icence** of CARDIQUE are not fully met because of budgetary problems. The environmental licence requires the elaboration of 5 plans:

1. The Commission observes that until now the information and dissemination plan has not been elaborated by the Ministry of Transport.
   The Commission suggests that the Ministry at least prepares a proposal for an outline for such a plan. The Commission considers coverage of a period of two years (starting now) adequate.
2. A water management and land use plan has not been elaborated either by the Ministry of Transport. During its visit, the Commission was informed on the spatial planning of Cartagena (POT, Plan de Ordenamiento Territorial, which will be decreed formally by the end of 1999).
   The Commission recommends that the Ministry of Transport invites Haskoning to prepare as soon as possible a concise report that includes preconditions in relation to water management and land use which are necessary for the well-functioning of the Tidal inlet. These preconditions can then be included in the POT.
3. The requisite of a security plan is being met by Haskoning.
4. Haskoning is responsible for preparing an operation and maintenance plan and will act accordingly, elaborating the plan at the end of the project time frame.
   The Commission recommends that Haskoning already prepares the key points of this plan in an earlier stage, in order to be able to better estimate which agency/organisation would be suitable to undertake this work.
5. The environmental monitoring programme consists of a proposal to monitor four elements of which the first two are executed at the moment by Boskalis.
   a. Water quality: This element of the monitoring programme has first priority, because it establishes and verifies the functioning of the Tidal inlet with respect to water quality objectives. The monitoring is ongoing since 3 months and will take 18 months in total (phase a). Its contents and execution are quite ambitious and adequate in the opinion of the Commission. Based on the data obtained until now, the programme will be adjusted (optimised) in cooperation with CARDIQUE, with respect to sampling points, essential parameters and frequency etc.

Phase b of the monitoring (during operation of the Tidal inlet) is reduced to 7 months, although the environmental licence requires 12 months.
The Commission recommends therefor to:

1. *Increase the frequency of monitoring in the first months following the operation of the tidal inlet to a maximum;*
2. *Hand over the equipment for monitoring and analysis and some resources so that the monitoring can continue at lower frequency to complete an annual cycle of 12 months;*
3. *Offer consultancy three times (every 3 months by the Ministry of Transport) with respect to the operation of the Tidal inlet in relation to the data obtained (capacity-building programme);*
4. *Organize a workshop, after completing the 12 months of phase b, to present the final results.*

With respect to the monitoring at long term (2-5 years during the operation of the tidal inlet), the Commission is of the opinion that this must continue to prove the necessity of executing the 'marine outfall' project. The 'marine outfall' project has a budget for this monitoring, which CARDIQUE is recommended to coordinate.

b. Coastal morphology: This element of the monitoring programme has second priority and is ongoing in the areas of La Boquilla and Crespo. The content and the execution are quite adequate in the opinion of the Commission.
For the monitoring in the long term (2-5 years during the operation of the Tidal inlet), the Commission recommends to continue, given the concerns of the inhabitants and DIMAR and because of the situation in La Boquilla. It is suggested and endorsed by CARDIQUE, that monitoring of the coast in the long term will be the responsibility of CARDIQUE and/or CIOH (oceanographic institute).

c. Sediments: This part of the monitoring programme is not executed. Knowledge of the quality of the sediments in the Ciénaga is important to determine the reference situation and to be able to optimize the water quality monitoring.
The Commission recommends to check the validity (recent information of sufficient quality?) of already existing documents on this topic. Subsequently, a decision can be taken whether sediment should be sampled. In case it is considered necessary, the sediment monitoring can be limited to one campaign, that can be optimized in coordination with CARDIQUE.

d. Biological monitoring: The parameters (primary and secondary producers, meiofauna, macrofauna) have to be considered as secondary effects of the anticipated improvement of water quality (primary effect). Nevertheless, for the public in general, these parameters are more important and define in principle the success of the Tidal inlet project. Furthermore, knowledge of the base-line situation is important as reference for the future.
The Commission understands that existing information on the four indicators is sufficiently adequate to determine this baseline situation.
Concerning the monitoring after the start of the operation of the Tidal inlet, the Commission is of the opinion that this is not strictly necessary from the point of view of the primary objective of the Tidal inlet project. However, it would be desirable to continue monitoring if funds could be tapped.

The **c ns c i n pe i** of DIMAR requires the construction of groins in the area of Crespo to protect the coast against erosion, but this requirement is not fulfilled, causing great concern among the inhabitants. The erosion not only is caused by the Tidal inlet, but also takes place because of natural phenomena and because of the construction of 4 groins by INVIAS (agency responsible for road construction).
The Commission repeats the necessity to construct the groins (see also the observations made in the review of June 1996, par. 2.6). Moreover, the Commission observes that it would be very efficient to realize these groins simultaneously or directly after the finalization of the project, because the equipment is already there, as well as the materials like sand and rocks. The Ministry of Transport (responsible for the Tidal inlet), INVIAS (responsible for the 4 groins already constructed) and the Municipality ('responsible' for natural phenomena) have to solve this problem.

INT OD TION

In 1996 the Commission for Environmental Impact Assessment in the Netherlands was requested by the Netherlands Minister for Development Cooperation to carry out advisory reviews of the Environmental Impact Statement and additional information prepared for the so-called Tidal inlet project near Cartagena in Colombia. These reviews have been carried out in close collaboration with CARDIQUE (Corporación Autónoma Regional del Canal del Dique)[1]].

In March 1997 an environmental licence for the execution of the project was granted by CARDIQUE and renewed in September 1998. This ‹Resolución no 0091' contains 14 articles, conditioning the environmental clearance.

The most relevant article for this report is article no. 2 that states: ‹*the environmental licence ....is subject to the compliance with all measures and actions proposed in the Environmental Management Plan and the recommendations indicated in the Advisory review of the additional information to the environmental impact statement Tidal Inlet Cartagena, Colombia, executed by the Commission and CARDIQUE and which forms an integral part of this provision'*.
Article 4 and 6 state that CARDIQUE is allowed to prescribe additional mitigating or compensating measures if the situation so requires.

The preparation for the execution of the project started early 1999. Boskalis is executing the works. In light of this development, the Minister for Development Cooperation, endorsed by the Colombian Ministry of Transport, requested the Commission to ‹conduct the project, environmentally and technically, by re-activating the collaboration with CARDIQUE in the evaluation of the review reports which will be drawn up during the execution of the works'. (see appendix 1 and 2).

In March 1999 the Commission and CARDIQUE received the report containing the monitoring programme: ‹Programa de Monitoreo Ambiental', febrero 1999.
The environmental licence of CARDIQUE and the letters of the Colombian and Netherlands Ministries formed the motive for a first advisory review of the environmental monitoring programme, which was published in June 1999.[2]] This review was endorsed by CARDIQUE.

STI I ATION O T APP OA

This first advisory review was sent to CARDIQUE, the Netherlands Ministry for Development Cooperation and Haskoning. While re-activating the collaboration with CARDIQUE, the Commission and CARDIQUE experienced that collaboration at two widely separated geographical locations makes effective interaction and exchange of ideas very difficult. The question arose whether the monitoring programme would not be too ambitious and whether it would be tailored sufficiently to Colombian circumstances. Also standards and enforcement were subjects of discussion.
It was proposed to plan a visit to Cartagena when the results of first sampling-campaigns (executed by Boskalis) would be available. On the basis of these results and on basis of the first advisory review of June 1999, a final monitoring strategy could then be determined, indicating which parameters are

1 For information on the project and the results of these reviews reference is made to the ‹Advisory review of the environmental impact statement Tidal Inlet, Cartagena, Colombia' of 27 June 1996 and ‹Advisory review of the additional information to the environmental impact statement Tidal Inlet Cartagena, Colombia' of 19 November 1996.

2 Advisory review of the environmental monitoring programme, Tidal inlet Cartagena, Colombia, 3 June 1999.

most suitable, the number and siting of sampling points and the frequency and time-span of sampling. For this site-visit a document for discussion was prepared[3]].
The proposal was endorsed by CARDIQUE and Haskoning and formally by the Ministry for Development Cooperation in a letter dated 24 September 1999 (appendix 3).
The aim and working programme of the site visit are presented in appendix 4. Site visit took place from 23-30 October 1999.

S TS AND INDIN S O T SIT ISIT

3.1 Positive effects of the site visit

- The Commission observed that the project has the full attention of the Ministry of Transport (that is the owner of the project), which was demonstrated by the presence during the whole week of a project manager and another representative of the Ministry of Transport during the debriefing session of the Commission. The visit of the Ministry to Cartagena was positive for several reasons, among which the Commission would like to underline the example that the visit offered the possibility to thoroughly discuss the specific contents and requirements of the Environmental licence.
- The presentation by Aguas de Cartagena (ACUACAR) of the Cartagena Water Supply, Sewerage and Environmental Management Plan (of which the so-called 'marine outfall' project is part), gave access to information which was not available before. Eg., the EIA which was drawn up for this project, yielded a lot of useful information (related to eg. the monitoring programme which this project also has to perform). Moreover, apparently ACUACAR now shows a more open attitude towards the Tidal inlet project. The Commission considers this as a very positive development because in this way the relationship that is needed between the two projects is better warranted (as they are complementary). This means for example, that the Tidal inlet project may take advantage of the budget which has been earmarked under the 'marine outfall' project for monitoring purposes (around US$ 2 million).

3.2 Other general observations

- Much information on the project was made available on several occasions, which, according to the Commission, can be considered as positive.
- This contributed to a more positive attitude towards the project. The resistance and the concerns which were perceived by the Commission during its first site visit (1996) were far not that manifest this time.
- The Commission observes that different agencies and organizations critically follow the project. To mention some of them; la Veeduría (a representation of the civil society), la Dirección Marítima (DIMAR), CARDIQUE, la Procuraduría Ambiental (Environmental Auditor), and the Comité de Vigilancia de la gestión ambiental pública (a committee to monitor environmental management) and also the Netherlands EIA Commission. This warrants to a large extent that the project is executed according to acceptable standards from an environmental point of view and from the perspective of sustainability. The fact that the project is being monitored by that many institutes provides for a favourable setting, although inter-institutional coordination shows some shortcomings.

3 Second advisory review of the environmental monitoring programme for the Tidal inlet project, Cartagena, Colombia, report for discussion to be used during site visit to Cartagena 23-30 October 1999.

- ! The Commission observes that the project has 'spin-off', such as capacity-building (through the involvement of students who are working on their thesis) and employment (subcontractors and others).
- ! The Commission is concerned about the fact that apparently existing information is not available (eg. in CIOH[4]] -oceanographic institute-, the universities) to Haskoning and CARDIQUE. This is due to the fact that communication is not optimal and that it is very difficult to obtain access to this information.

3.3 Points of attention for successful project implementation

In order to have an idea what can happen in the short and long term, the Commission presents in this paragraph some scenarios, so as to raise awareness amongst all parties involved of the possible risks of the project[5]]. These risks (or circumstances potentially leading to undesired impacts) can be divided into two categories:

a) Circumstances which will not necessarily take place, but if they indeed will materialize, they have to be considered as calculated risks, which were run when the project was approved. Some scenarios are:
   - ecosystem changes as a result of the altered hydraulic regime (affecting biodiversity and habitats/biomasses);
   - the risk of a changed and still undesirable situation with respect to eutrophication;
   - the operation of the 'automatic' gates does not work as foreseen due to eg. maintenance or too much friction.
   - the flow of water through the Ciénaga is not optimal; some sectors of the lake may not be influenced by the flushing activity;
   - potential redistribution and/or spreading of polluted sediments from the southern part of the Ciénaga, increasing the state of pollution of the lagoon.

b) Factors/developments which can influence the water quality of the Ciénaga and thus the 'success' of the Tidal inlet and which have to be taken into consideration in the evaluation and interpretation of the monitoring dates. Examples are:
   - the ongoing 'land reclamation' in the squatter area of the Ciénaga which may change e.g. the hydraulic regime of the lagoon and which might have consequences for the lay-out and design of the groin. Also other impacts may arise as a result of reduced volume and increase in pollution;
   - the inflow of the polluted water from the tributaries does not decrease and small scale industries keep on discharging to the Ciénaga;
   - due to the construction of the in/outlet the urgency of building a waste water treatment plant or effluent pipeline is not present and consequently the plans are postponed and later abandoned;
   - a more attractive environment attracts more people to the Ciénaga, which will possibly lead to induced impacts.

T ANS O T P O T A T OMP TIN T ONST TION O S

The Commission remarks that until now it is not defined which will be the agency/institute/organisation that will take over the project. The project will be handed over

4 Centro de Investigaciones Oceanográficas e Hidrográficas

5 The figure in appendix 5 can help to provide insight in the situation

formally to the Ministry of Transport (the client/owner), but an agency responsible in Cartagena itself has to be appointed. According to all parties with which the Commission had discussions during the site visit, this agency should be the District (local owner) and the Municipality (probably represented by ACUACAR as its executing agency for operational purposes).
Summarizing, before the project is handed over, there has to be given clarity on the institutional setting: eg. an agency has to be defined responsible for the monitoring system, as well as an authority that can impose sanctions and will respond to claims (eg. from the tourist industry), an agency for 'capacity building and transfer' etc.

ATIONS IP T N T TIDA IN T P O T AND T MA IN O T A P O T

The Commission remains concerned with respect to the progress of the 'marine outfall' project (which is vital for the sustainability of the project at long term). The Tidal inlet will improve the water quality in the Ciénaga immediately following the operation of the Tidal inlet and it is expected that the norms can be complied with for a period of about 8 to 10 years (starting from 2001)[6]]. After this estimated period, water quality will be below standards again, because of increasing discharges. According to the timetable of the 'marine outfall' project, the project will start functioning from 2005 onwards. The precondition for being able to comply with this tentative date is that all contract/agreements at the Colombian side will be signed by the end of 1999 (total project costs amount 120 million US$, of which the World Bank already approved a 80 million US$ loan). The expectation is that there will be delay in the progress because of economic and financial difficulties. The Commission wants to re-emphasize that, although there is still time, the timely implementation of the 'marine outfall' project remains very urgent. This is not only so because of environmental and sustainability reasons (positive effects as well at long term). Also, the monitoring programme (base line situation) of the 'marine outfall' project could generate data relevant for the well functioning of the Tidal inlet. To start this monitoring however, funds have to be available. The earlier the funds become available, the better the results of the monitoring programme.
The Commission observes that all parties involved, including the authorities, are well aware of this key issue.

POINTS AT D TO T N I ONM NTA I N O A DI

The environmental licence of CARDIQUE requires that the following plans are prepared:
a. Information and dissemination plan
b. Water management and land use plan
c. Security plan
d. Operation and maintenance plan
e. Environmental monitoring programme
The last point will be dealt with in more detail in Chapter 7.

6.1 Information and dissemination plan

The Commission observes that until now this requirement has not been met by the Ministry of Transport. The Commission suggests that the Ministry at least prepares a proposal for an outline for such a plan. It is not considered necessary to prepare a comprehensive plan. The Commission considers coverage of a period of two years (starting now) adequate. After this period, the 'marine outfall' project can take over this responsibility. CARDIQUE emphasizes that in this moment she would not support the idea of joining the information plans of both projects, because the 'marine outfall' project has a negative image and could harm the positive image built op by the Tidal inlet project.

6 Period estimated based on the models used by Haskoning; these models are based on a large number of assumptions regarding future developments. In practise the situation might change (see 3.3) causing another outcome of the prognoses.

6.2 Water management and land use plan

This requisite has not been fulfilled either. Also in this case the Ministry of Transport is responsible. During its visit, the Commission was informed on the spatial planning of Cartagena (POT, Plan de Ordenamiento Territorial, which will be decreed formally by the end of 1999). In the opinion of the Commission this can be valued positively, because in 1996 (the last visit of the Commission) there was no such plan available. The Commission recommends that the Ministry of Transport invites Haskoning to prepare as soon as possible a concise report (not exceeding 2 pages) that includes all relevant aspects in relation to water management and land use which are necessary for the well-functioning of the Tidal inlet. This report could consist of preconditions which have to be included in the POT when the area and surroundings of the Ciénaga are concerned. The preconditions can be elaborated subsequently in the POT through a specific/partial plan for the Ciénaga. In this way two efforts can be joined.
The Commission wants to express her concern in relation to the implementation of the POT, as the institutional framework and control and enforcement mechanisms appear to show some deficiencies.

6.3 Security plan

Haskoning is complying with this requirement

6.4 Operation and maintenance plan

Haskoning is responsible for preparing this plan and will act accordingly. However, it is very likely that this plan will be prepared at the end of the project time frame. At the moment it is also not clear who will execute this plan after the project is handed over (see also chapter 4). To anticipate, te Commission recommends that Haskoning already prepares a summary of the key points of this plan in an earlier stage, in order to be able to better estimate which agency/organisation would be suitable to undertake this work (and also to already have an idea on risks/problems that may occur, such as problems in the movement of the gates by obstruction by eg. trunks, or the dredging of the sand tramp that will be required within some 10-15 years).

MONITORING PROGRAMME

The monitoring programme consists of four elements:
a. Water quality
b. Coastal morphology
c. Sediments
d. Eco-system (biological parameters)

Before these themes are elaborated into more detail, the Commission presents the following general observations:

7.1 General observations

! In the EIA-study (Diagnóstico Ambiental de Alternativas) for the Tidal inlet, and in the advisory reviews of the Commission/CARDIQUE, the necessity for a monitoring programme with the above mentioned subjects was established. However, this necessity was formulated in general

terms. In the environmental licence of CARDIQUE, this requirement was copied, without specifying the programme (because -according to CARDIQUE- otherwise the progress of the project would be hampered).
The actual monitoring performed now by Boskalis only consists of the first two elements of the programme: monitoring of the water quality and morphology during 25 months.

! Both campaigns are being executed since 2 months. Originally, a monitoring programme of 2 phases was foreseen: (a) 13 months during construction and (b) 12 months after completion of the construction works to cover an annual cycle. The Ministry of Transport decided to prolong the construction phase from 13 to 18 months, which consequently means that phase b was reduced to 7 months only (this period at the same time is considered as a minimum, because this period is needed to demonstrate the well-functioning of the Tidal inlet).

! Various additional justifications can be given for the execution of the monitoring programme:
   a. for CARDIQUE it is a formal obligation, because it is required in the licence (formal monitoring);
   b. it is considered important in general to dispose of a reference situation with respect to the four elements of monitoring (technical monitoring, to check to which extent the objectives of the project are reached and to be able to adapt project operation to prevent negative developments);
   c. for the Tidal inlet project it is important to determine the base line situation as a reference and have certainty with respect to possible negative events that might happen in the Ciénaga or the coast independently from the Tidal inlet, but that possibly could be related to the Tidal inlet (monitoring with the purpose of communication of with the function of safeguarding against claims);
   d. another reason is that the programme offers the possibility to investigate the environmental situation in the area concerned, eg. the state of the mangroves (monitoring with a scientific goal);
   e. finally, the gathered data offers a starting point for the monitoring programme within the 'marine outfall' project (coordination of monitoring).

! It is observed that within the Diagnóstico Ambiental de Alternativas this reference situation should have been determined already.

7.2 Water quality monitoring

! This element of the monitoring programme has priority number 1, because it establishes and verifies the functioning of the Tidal inlet with respect to water quality objectives (norms based on use for recreational purposes and a mesosaproob water system).

! As described above, this part of monitoring is ongoing. The contents and execution of this part of the programme is adequate in the opinion of the Commission (the Commission makes some more detailed comments and recommendations in appendix 5). However, it is not clear whether long term monitoring will be executed.

! Based on the data obtained during the first three months, the programme will be adjusted (optimised) in cooperation with CARDIQUE, with respect to sampling points, essential parameters and frequency etc. Moreover, CARDIQUE suggests to publish the data of the first three months, or an interpretation thereof, in a public leaflet/magazine[7]].

7 Quarterly published by CARDIQUE for a general audience

! With respect to the difficulty that phase b of the monitoring (during operation of the Tidal inlet) is reduced to 7 months, it is noted that the environmental licence requires a phase b of 12 months.
The Commission recommends to search for a solution that consists of 4 elements:
1. The frequency of monitoring in the first months will be increased to a maximum, and heavy metals are included (at the moment they are below the detection level and can therefore be skipped from the programme in phase a);
2. The equipment for monitoring and analysis and some resources are made available so that the monitoring can continue at lower frequency (sampling every three months) to complete an annual cycle of 12 months, meaning three campaigns;
3. The Ministry of Transport offers consultancy three times (every 3 months) with respect to the operation of the Tidal inlet in relation to the data obtained (capacity-building programme);
4. Funds are made available to organize a workshop at the end of the 12 months of phase b, to present the final results.

! With respect to the monitoring at long term (2-5 years during the operation of the tidal inlet), the Commission is of the opinion that:
- the developments at long term are important to prove the necessity of executing the 'marine outfall' project;
- the 'marine outfall' project has a budget for this monitoring: CARDIQUE coordinates this aspect.

7.3 Coastal morphology

! This element of the monitoring programme has second priority.

! As has been indicated above, this part of the monitoring programme is ongoing in the areas of La Boquilla and Crespo. The content and the execution are at first glance adequate in the opinion of the Commission. However, there is no clarity on the monitoring in the long term.

! With respect to the fact that the Ministry of Transport has proposed to reduce phase b (monitoring during operation of the Tidal inlet), it is concluded that this will not be a problem because the construction of the groins (inlet works, which are nearly finished) determine the moment of 'operation'.

! As for the monitoring in the long term is concerned (2-5 years during the operation of the Tidal inlet), the following is observed:
- the developments in the long term are important, given the concerns of the inhabitants and DIMAR and because of the situation in La Boquilla;
- it is suggested and endorsed by CARDIQUE, that monitoring of the coast in the long term will be the responsibility of CARDIQUE and/or CIOH.

7.4 Monitoring of sediments

! To prevent misunderstanding: investigation of sediments does not refer to the characterization of the material which will be excavated from the Caño Juan Angola. This aspect is a normal obligation belonging to the works and the execution of this part of the project should have been budgeted within the contract with Boskalis. In any case, material excavated from the Caño Juan Angola is expected to be polluted. Attention should be paid to the safe disposal (including a description of the site selection, measures to be taken, e.g. monitoring of ground water,

preparation of the area and the clearing of the site) and the anticipated use and related finishing of the disposal area.

! Knowledge of the quality and quantity of the sediments in the Ciénaga (toxics, nutrients, etc.) is important to determine the reference situation and to be able to optimize the water quality monitoring.

! The Commission found that there is information in CIOH on sediment quality in the Ciénaga. It is recommended to control the validity (recent information of sufficient quality?) of these documents. On the basis of this evaluation a decision can be taken whether or not sediment monitoring should be executed. In case it is considered necessary, the sediment monitoring can be limited to one campaign. This campaign can be optimized in coordination with CARDIQUE.

7.5 Monitoring of eco-system (biological parameters)

Monitoring of the eco-system contains the following indicators[8]]:
- primary and secondary producers
- meiofauna
- macrofauna

These indicators may demonstrate 'secondary effect' changes due to the anticipated improvement of water quality (primary effect). Nevertheless, for the public in general, these parameters are more important and define in principle the success of the Tidal inlet project.
Furthermore, knowledge of the base-line situation is important as reference for the future.

7.5.1 **Mang es**

! The existing information on mangroves includes parameters based on three transects in the area around the Ciénaga, performed within the 'Proyecto de Manglares' and includes aerial photography. Base on interviews with consultants working for CARDIQUE, the Commission understands that this information is sufficiently adequate to determine this baseline situation.

! The EIA for the 'marine outfall' project recommends to establish a baseline situation before the Tidal inlet starts operating. The 'marine outfall' project has funds reserved for this monitoring.

! Given the importance that the inhabitants pay to the mangroves, CARDIQUE will ask, in the framework of the environmental licence, some way of monitoring of mangroves in the Ciénaga.

! Concerning the monitoring after the start of the operation of the Tidal inlet, the Commission is of the opinion that this is not strictly necessary from the point of view of the primary objective of the Tidal inlet project. However, it would be desirable to continue monitoring if funds could be tapped.

7.5.2 **O e indica s**

The conclusions mentioned above are also valid for the other indicators.

8 See also appendix 5

POINTS AT D TO T P MIT O DIMA

In the area of Crespo groins have to be constructed to protect the coast against erosion. This construction is required according to the permit of DIMAR, but this requirement is not fulfilled. The Commission observes that this causes a great concern among the inhabitants and this point is mentioned several times (especially during the public participation workshop held during the visit, appendix 4a). Haskoning is preparing a design to optimize the proposal for construction (combination of groins with sand suppletion). This design will take about one more month. Moreover, the Commission remarks that this process of erosion not only is caused by the Tidal inlet, but also take place because of natural phenomena (the trend is that this point of the coast is suffering from erosion anyhow) and because of the construction of 4 groins by INVIAS[9]]. The Commission considers it necessary that the groins are constructed, because the area of Crespo has to be protected (see also the observations made in the review of June 1996, par. 2.6). Moreover, the Commission observes that it would be very efficient to realize these groins simultaneously or directly after the finalization of the project, because the equipment is already there, as well as the materials like sand and rocks. In this case there are three parties involved: Ministry of Transport (responsible for the Tidal inlet), INVIAS (responsible for the 4 groins already constructed) and the Municipality ('responsible' for natural phenomena). The problem therefore has to be solved by these three parties, although the Commission is well aware of the problems with lack of funds.

9 Part of the Ministry of Transport dealing with road infrastructure