APPENDICES

with the advisory review of the environmental aspects of the implementation of the Tidal Inlet project, Cartagena, Colombia

(appendices 1 to 6)

APPENDIX 1

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

Ministerie van Buitenlandse Zaken
Neda

Dirección Cooperación al Desarrollo y
Empresariado Holandés
Bezuidenhoutseweg 67
Apartado Postal 20061
2500 EB LA HAYA

Comisión para la evaluación del impacto ambiental
A la atención del Director J.J. Scholten
Apartado Aéreo 2345
3500 GH UTRECHT

Fecha	8 de octubre de 1998
Ref.	DOB-0636.jk/98
Pág.	1/2
Anexo(s)	-
Asunto	WW050202, no.MER/1998/014 Asesoría proyecto Tidal Inlet Cartagena, Colombia

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Telefax: 31-(0)70 3486726
E-mail: j.kok@dob.minbuza.nl

Distinguido señor Scholten:

Como es de su conocimiento, Holanda ha ofrecido a Colombia una donación para la financiación parcial con fondos ORET, para la ejecución del proyecto Cartagena Tidal Inlet, a cargo de BOSKALIS. Se espera que el contrato correspondiente pueda hacerse efectivo en breve.

En la fase inicial de dicha ejecución, en estrecha y exitosa colaboración con la organización local responsable, CARDIQUE, la Comisión para la evaluación del impacto ambiental (MER) ha examinado dicho impacto. Haciendo referencia al contrato entre la citada Comisión MER y el Departamento de Cooperación al Desarrollo, nos permitimos reiterarle nuestra solicitud relativa al seguimiento, en materia ecotecnológica, del proyecto, mediante la reactivación de la cooperación con CARDIQUE, para la evaluación de los informes de verificación que se presenten durante las obras de ejecución.

Le solicito atentamente me envíe datos sobre la composición del grupo integrado por expertos colombianos y holandeses, así como el presupuesto asignado para las actividades. En el marco de las actividades, se brindará asesoría a las Autoridades colombianas y al Departamento de Cooperación al Desarrollo.

EL MINISTRO DE COOPERACION AL DESARROLLO
En su nombre,
El Director Adjunto de la Dirección Cooperación al Desarrollo y Empresariado Holandés

H.P. Verhoeff

c.c. DML/MI (Wevers)

APPENDIX 2

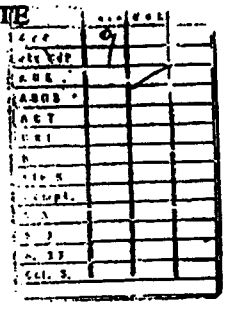
Letter from the Colombian Ministry of Transport dated 7 October 1998, in which the Commission has been asked to submit an advisory review.

7 OKT. 1998

REPUBLICA DE COLOMBIA

0022375 MINISTERIO DE TRANSPORTE

IEI
Santafé de Bogotá D.C., 07 OCT. 1998



Señor
GIJSBERT J.A.M. BOS
EMBAJADA REAL DE LOS PAISES BAJOS
Carrera 13 No. 93-40 Piso 5
Santafé de Bogotá

ASUNTO: BOCANA ESTABILIZADA DE MAREA EN LA CIENAGA DE LA VIRGEN EN CARTAGENA

Excelentísimo señor Embajador:

Por la presente nos permitimos comunicarle que hemos recibido con agrado la propuesta de enviar, sin costo adicional alguno para este país, a un grupo de expertos ambientales del Gobierno Holandés (Comisión MER), para que participe en el monitoreo y evaluación de impactos ambientales en el Proyecto de la Bocana Estabilizada en la Ciénega de la Virgen. Como la propuesta ha sido bien recibida por este Ministerio por considerarla de suma importancia para beneficio del proyecto, le agradecemos que se adelanten las gestiones necesarias para que podamos contar con la colaboración de dicho grupo.

Del Señor Embajador,

JUAN ALBERTO PAEZ MOYA
Viceministro de Transporte

Copia: Despacho Sr. Ministro
Despacho Sr. Viceministro
Dirección General de Tte. Fluvial
Subdirección Infraestructura Fluvial
División de Estudios e Inv. Fluviales
MTBM/nubia 6/10/1998

024-119

APPENDIX 3

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

Ministerie van
Buitenlandse Zaken

Commissie voor de Milieueffectrapportage
t.a.v. Dhr. J.J. Scholten
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3500 GH Utrecht

Directie Ontwikkelingssamenwerking en
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Datum 24 september 1999
Kenmerk DOB-1277.jk/99
Blad 1/1
cc. DML/MI
Betreft WW050202, nr. 005/99
ORET project Tidal Inlet
Cartagena, Colombia

Behandeld J.A. Kok
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Geachte heer Scholten,

Referte het overleg tussen DGIS/DOB en Mw. Steinhauer van de Commissie, meer specifiek haar brief van 3 juni, waarbij de mogelijkheid van een bezoek in het najaar aan Cartagena door leden van de werkgroep van het "Pograma de Monitoreo Ambiental" voor het Tidal Inlet project is besproken, verzoek ik u dit werkbezoek uit te voeren.

Het werkbezoek heeft ten doel:

1. Technische assistentie te verlenen aan CARDIQUE bij haar monitoring van de uitvoering van het project en daarbij met name het Haskoning monitoring programma;
2. Het zich ter plekke informeren over de voortgang bij de projectimplementatie en de consequenties voor het milieu daarvan;
3. Het bij de autoriteiten benadrukken van het belang dat vanuit milieuoogpunt wordt gehecht aan een liefst gelijktijdige oplossing van het sewerage probleem.

Ik hecht eraan dat er op wordt toegezien dat de projectimplementatie op een vanuit milieuoogpunt acceptabel wijze geschiedt. Uw ondersteuning van CARDIQUE daarbij is van groot belang. Evenwel is het ook mijn wens dat CARDIQUE in staat zal zijn haar taak in de nabije toekomst zónder aanvullende technische assistentie vanuit Nederland te vervullen. Graag zou ik daarom na het bezoek bij de presentatie van uw bevindingen worden geïnformeerd over de indruk die de werkgroep heeft van de institutionele capaciteit van CARDIQUE.

Ministerie van
Buitenlandse Zaken

Uw contactpersonen voor deze opdracht bij DGIS zijn Mw. Anneke Wevers van de Directie Milieu en Ontwikkeling en Dhr. Jan Kok van de Directie Ontwikkelingssamenwerking en Nederlands Bedrijfsleven. Ik stel er prijs op wanneer ook de Nederlandse Ambassade in Bogota wordt geïnformeerd over uw bevindingen.

Referte de overeenkomst van januari 1998 tussen de Commissie en het DGIS, ontvang ik van u gaarne het werkprogramma alsmede een opgave van het benodigde budget.

Hoogachtend,

J.A. Kok,
Directie Ontwikkelingssamenwerking en Nederlands Bedrijfsleven

Kenmerk VolgKenmerk*
Blad 2/2

APPENDIX 4

Working programme site visit

October 25th	08.30 - 10.00	Presentation of the project – present situation, presentation by HASKONING
	10.00 - 11.00	Site visit
	14.30 - 18.00	Interaction CARDIQUE – Ministry of Transport - Commission for EIA - HASKONING
October 26th	09.00 - 12.30	Presentation of the Marine outfall project, Timetable of execution and present situation, Sources of finance, Environmental management plan (monitoring and construction stage), Institutional co-ordination
	14.30 - 18.00	Participation in monitoring campaign sampling the quality of the water
	Simultaneously:	
	14.30 - 16.00	Presentation of POT (Actuaciones Integrales Urbanas Ciudad de los Alcatraces y Ciudad de la Virgen) – Water use and land use plan, Institutional co-ordination
	16.30 - 18.00	DIMAR: Co-ordination inter-institutional-requirements and conditions
October 27th	09.00 - 11.00	Working group meeting: acceptance of the proposals (monitoring of mangrove, biological monitoring and sediment monitoring)
	11.00 - 12.30	BOSKALIS: Relevant environmental issues to be defined or to be discussed by the Commission for EIA - CARDIQUE
	14.30 - 17.30	Workshop (an invitation was sent to: institutes and local authorities, see also appendix 4, page iii)
October 28th	09.00 - 12.30	CARDIQUE: The institutional capacity of the co-operation (suboffice of the environmental management) and visit to the laboratory of CARDIQUE
	14.30 - 23.00	Joint analysis of all the activities for drafting report

October 29th	08.30 - 12.30	Working group meeting: analysis and conclusions of the site visit, writing the report
	14.30 - 18.00	Presentation of the observations and conclusions of the site visit for representatives of the Embassy and Ministry of Transport (contributions by HASKONING, BOSKALIS and CARDIQUE)

List of participants in workshop on 27 October 1999

CARTAGENA DE INDIAS, OCTUBRE 27 DE 1999
TALLER
COMISION EVALUACION MER - CARDIQUE - PROYECTO LA BOCANA
SALA DE JUNTAS - CÁMARA DE COMERCIO DE CARTAGENA
LISTA DE ASISTENTES

NOMBRE	ENTIDAD	CARGO	TELEFONO
Oscar A. Alvarez	POT	Consultor	6566573
Teobaldo Cavadia M.	Asoc. Lideres Ciudad	Relaciones Públicas	6627595
CF Fernando Ochoa R.	C.I.O.H	Jefe Div. Oceanográfic	6694427/65
William Dau	Corp. Cartagena Honesta	Director	6645896
Ernesto Carreño	Capitanía Puerto	Inspector	6550584
Rafael Ruiz Arango	Univer. De Cartagena	Químico Farm.	
Ing. Juan Roca Bustamante	Univer. De Cartagena	I.H.S.	6600665
Jaime Peña Alvarez	Personería	Personero Delegado	6600066
Alvaro Monterroza	Damarena	Jefe División. Técnica	6644415
Rafael Cuesta Garcés	Asoc. Comunal de Juntas	Comuna #5	6710604
Orlando de la Rosa	Univer. De Cartagena	Analista	6698179
Dídimo Mendivil C.	Personería Distrital		6600464
José Henry Carvajal	Ingeominas		6620258
Luz Elena Molina	Ingeominas	Ing. Geologo	6620258
Nestor Carrillo	POT	Consultor	6691023
Luis Pacheco Caro	Ecomarina	Auxiliar	6640012
Luis García N	Red Veeduria	Miembro	6813062
Nelson Bolaños Medrano	Red Veeduría	Miembro	6631778
Francisco A. Castillo	Red Veeduría Ciudadana	Director Financiero	6658486
Felipe Vegara M	Red Veeduría	Abogado Consultor	0336529868
Orlando Ortiz LLanos	Cámara de Comercio	Consultor	6600793-95
German Beltran García	Cardique	Profesional Espec.	6605250
Jaime Romero Ortega	Cardique	Profesional Espec.	6605250
Leyla González	Cámara de Comercio	Directora Adtiva y Eco	6600793-95
Nausicrate Pérez	Comité Independiente		6641701
Policarpo Peña Ortiz	Corporación Social	Miembro	6627146
Pedro L. Mogollón	Cámara de Comercio	Director	6600793-95
R. Moor	Haskoning	Gerente	663535
M.V. Maren	Haskoning	Ecologo	663535
J.A. Emiliani	Haskoning	Interventor	663535
J. Jeferson Garzón	Mintransporte		
Jan Willem Kroon	MER	Presidente	
Aart Schahul	MER	Experto Saneamiento Ambiental	
Tjihe Nauta	MER	Experto Calidad de Agua	
Ineke Steihauer	MER	Secretaria Técnica	
José Ma. Martínez	Procuraduría	Procurador	660043
Miguel E. Lora Pedroza	Cardique	Subdirec. G. Ambie	6605250

APPENDIX 5

Observations and recommendations in relation to the monitoring campaigns

The Commission believes that the project monitoring programme should address the following aspects (in order of priority), see also chapter 7 of the main text:

1. Demonstration of the working of the tidal inlet: focussed on the flushing of the Ciénaga and the Canal Juan Angola.

2. Identification of state (concentrations) and trends (to describe the present situation and system functioning and to be used to optimize the implementation of the project).

3. Testing of compliance with standards and/or classification.

It is questioned whether the monitoring data will really be used to optimize the implementation of the project, as the project planning is very tight.

It should be recognized that the system functioning will alter due to the engineering works (increased and more or less constant salinity levels, controlled water levels, reduced pollution levels, etc.). Most ideally a project would include a temporal and spatially optimised monitoring programme for a wide range of parameters that could describe all such changes (covering all aspects such as morphology, hydrodynamics, sediment transport, sediment quality and water quality and ecology, see Figure below). However, given the scope/budget of the project and the historical setting, the Commission states that the minimal programme should include those parameters that are directly related to the demonstration of the working of the tidal inlet, to fill in gaps in knowledge in relation hereto, and to adequately address the present worries to undesirable side-effects (e.g. release from the sediments that might affect the water and soil quality at the beaches).

In this respect the Commission believes that the present monitoring (locations, parameters, frequency) is adequate and is carried out adequately. Below some general observations are made and suggestions are given to further improve the programme.

Observations / suggestions:

- The monitoring is carried out by a dedicated and enthousiastic team in a reasonably efficient way. It will be benificial, however, that the monitoring results are analysed and interpreted at site or at least immediately following the analysis, in order to allow for modifications. It is emphasized that this should be carried out by someone who is capable of interpreting the observations, and fully understands the system functioning and subsequent expected water quality levels.

- While the set of parameters is considered sufficient, the Commission strongly advices to pay full attention to a few parameters (coliforms, DO/BOD) that are immediately related to the above monitoring objectives of the project. With respect to coliforms it is stressed that certain aspects and phenomena should be taken into account; (i) Coliforms show an extreme daily variability: therefore the time of sampling between the different monitoring campagnes should be more or less similar. This variation is considered far more important than to adjust the sampling time to the

tidal stage or whatever other forcing. (ii) With probable T90 values in the order of only a few hours it becomes very important to limit the period in between the sampling and the analysis to the extent possible. Due to these two aspects present observations are hardly comparable and probably present serious underestimates. Oxygen levels will show a similar daily variations (from zero to super-saturation levels). With respect to BOD it is known that these analyses are subject to uncertainties under saline conditions. In this respect it might even be preferred to replace this parameter by CODcr (representing a more or less maximum oxygen demand in the water phase). However, these analyses are less strait forward. For both parameters, coliforms and BOD/COD, it is considered extremely important (to avoid substantial underestimates) that the analyses will start immediately following the sampling. At present the analyses take place, at earliest, the following day. In addition and specially with respect to the coliforms, the duration of the sampling programme (few hours) is that long, that adequate storage conditions on board become very important too (cool and dark).

- It may be beneficial to monitor a few parameters extensively over a well-described period of 24 hours, in order to better understand the daily variations and behaviour.

- At present some of the metal levels are at or near detection limits (during the first monitoring campaign). For these parameters, the frequency might be reduced to once per season. It is strongly advised to carry out these analyses also after the finalization of the works to demonstrate the (lack of) release from the sediments. It is expected that with future flow velocities and expected changes in the chemical / biological state of the toplayer of the sediments no serious increased release will be observed. In general, it is more useful (though more complex) to analyse the suspended sediment quality (ug/g).

- It might be helpful for demonstration purposes if the available water quality model is used to calculate the travel times from various sources: $t = 1/k \ln (C0/C)$. In such a way the impacts of the works might be better understood.

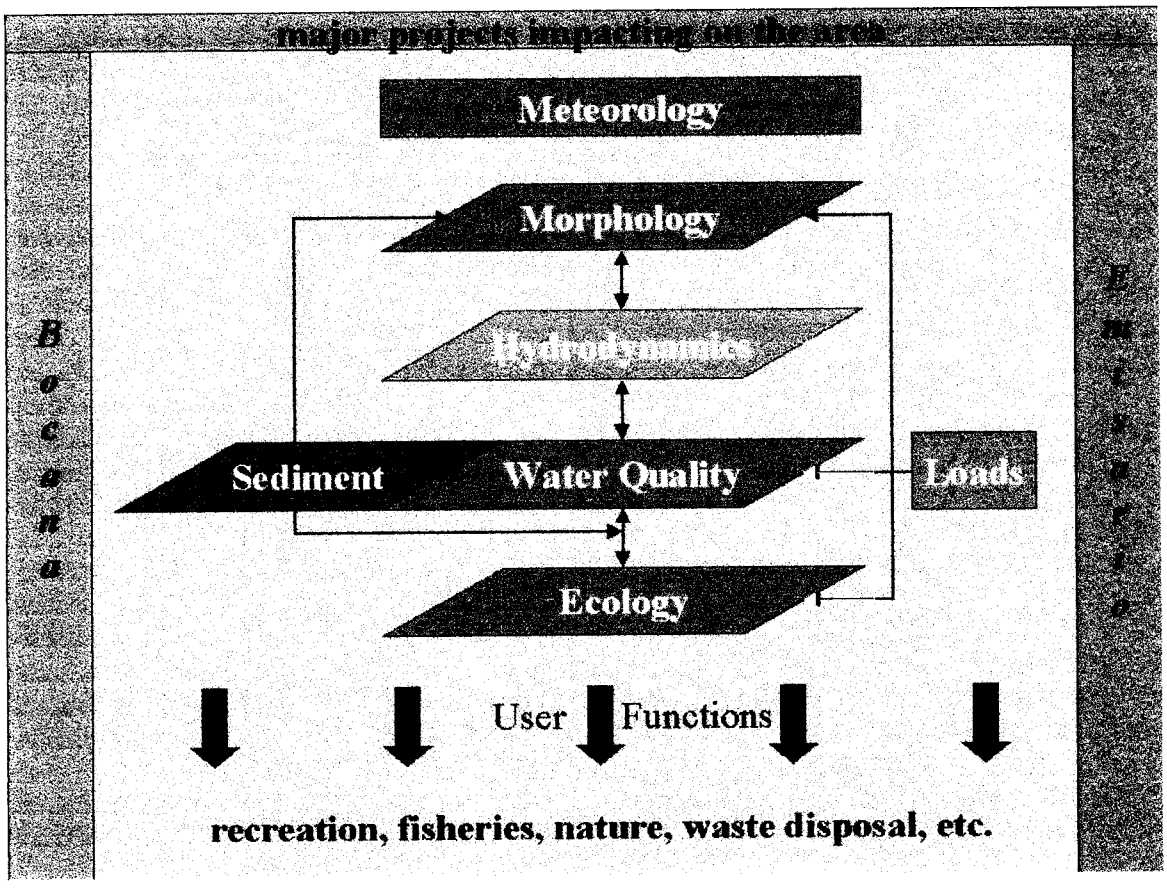
- The nutrient concentrations will be helpful in understanding future changes in the state of eutrophication (N/P ratios, evaluation of possibly limiting levels). Ammonium concentrations can be related to the levels of un-ionised ammonium (toxic and at present seriously exceeding international standards). It should be realised that without the 'Proyecto Emisario' nutrients levels are very high and with the increased light availability (flushing with seawater with a higher transparency) eutrophication may still pose a serious problem to the Ciénaga (despite the reduced residence times). Even in case of the implementation of the 'Proyecto Emisario', the Ciénaga will demonstate years with high internal loadings. This is one of the (calculated) risks of the project and should be considered well.

- The presentation of results in the monthy monitoring reports may be improved by clustering the different subsystems (Ciénaga, canal, coast, etc.). In addition the monitoring sheets used during the sampling should include a column with remarks to allow for understanding of odd values afterwards. Meteorological conditions (wind direction, wind velocity, cloudiness, etc.) should also be closely registrated to allow for comparisons afterwards.

- An additional benefit of the monitoring programme might be related to early warning and detection, useful information for the local management. However, it would mean that this information should become available in time.

- With respect to standards / objectives it is suggested to be careful with presenting all kinds of international standards and objectives that might not be valid for such a tropical system (especially related to describing the ecological state). Objectives should be related to similar (regional) estuarine systems. Also historic non-polluted conditions might be helpful, though it should be realised that these will reflect the previous system behaviour under non-polluted conditions.

Below some tables are presented, that can be used to clearly state / present what the project will and will not address. These tables may be used to address present and future discussions regarding the monitoring programme. It is advocated to utilise the opportunities provided by the 'Proyecto Emisario' to increase the understanding and development of the system, see Figure.



	Risks and uncertainties Ciénaga, canal, coastal area, ..	Addressed by the project	Remarks
Meteorology			
Morphology			
Hydrodynamics			
Loads			
Transport and water quality			
Sediment quality			
Ecology			

	Key parameters	Available information to describe present situation (reference)	Remarks
Meteorology			
Morphology			
Hydrodynamics			
Loads			
Transport and water quality			
Sediment quality			
Ecology			

It was understood that an impressive amount of data / information is already existing (additional to what has been described in the EIA), but that the availability is still questionable. This should be addressed by CARDIQUE. The information available suffices to reasonably describe the present ecological functioning of the Ciénaga: primary producers (including dominant phytoplankton species), secundary producers (including areal coverage mangroves, transects), meiofauna (species), macrofauna (including fish species and biomasses).

	Key parameters	Required for monitoring	Remarks
Meteorology			
Morphology			
Hydrodynamics			
Loads			
Transport and water quality			
Sediment quality			
Ecology			

Parameters	Opportunities within other projects
Meteorology	
Morphology	
Hydrodynamics	
Loads	
Transport and water quality	
Sediment quality	
Ecology	

APPENDIX 6

Map of the area