United Nations Environment Programme

UNEP/GEF South China Sea Project

Global Environment Facility

Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand

REPORT

Third Meeting of the Regional Working Group for the Land-based Pollution Component

Phuket, Thailand, 7th – 10th July 2003

UNEP/GEF
Bangkok, July 2003

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Report of the Meeting

1. OPENING OF THE MEETING

1.1 Welcome Address

1.1.1 Mr. Yihang Jiang, Senior Expert, Project Co-ordinating Unit (PCU), welcomed the participants on behalf of Dr. Klaus Topfer, the Executive Director of UNEP, Dr. Ahmed Djoghlaf, Director, Division of GEF Co-ordination. He conveyed the good wishes and regrets of Dr. John Pernetta, Project Director, who was unable to attend the meeting.

1.1.2 Mr. Jiang apologised for the twice postponements of this meeting, caused by the SARS outbreak and by the late receipt of national reports by the PCU. He emphasised that this delay has impacted adversely upon project implementation; The Third meeting of the Regional Scientific and Technical Committee (RSTC) had only just been held recently, and it was unfortunate that this meeting of the Regional Working Group for the Land-based Pollution (RWG-LbP) could not be held before the 3rd RSTC meeting. Therefore, it will be necessary to decide on how to report the outcomes of this meeting to the RSTC. These delays have caused a backlog of the RWG-LbP's work.

1.1.3 He informed the meeting that its main task was to agree on a shortlist of hot spots in order to prepare the pilot activity proposals. He noted that the participating countries have identified their national priorities, but the RWG-LbP has to consider that this is a regional project in identifying and short-listing the pilot activities, which should address regional and/or global priorities. Given its limited budget, the project will not be able to clean up whole hot spots. There is, therefore, a need to identify appropriate activities that address the root causes of pollution problems, within the available budget.

1.1.4 Mr. Jiang expressed his hope that the meeting will be successful and that the participants will enjoy Phuket at the same time.

1.2 Introduction of Members

1.2.1 Participants were invited to introduce themselves on their scientific background and roles in project implementation.

1.2.2 As requested by the meeting, the Senior Expert informed the meeting of staffing developments in the PCU and of the progress of the Intern Programme, involving junior staff from the responsible ministries in the participating countries, which is intended to familiarise themselves with the project. This programme would be executed in 3 phases – Phase 1 (ongoing): with interns from Indonesia and Thailand; Phase 2 (starting September 2003): Cambodia, China and Malaysia; and Phase 3 (first half of 2004): Vietnam and the Philippines.

1.2.3 The List of Participants is attached as Annex 1 to this report.

2. ORGANISATION OF THE MEETING

2.1 Designation of Officers

2.1.1 Mr. Jiang conveyed Mr. Sudariyono's, the Chairperson of the Regional Working Group, apologies for not being able to participate in this meeting. He reminded the meeting that the Rules of Procedure state that, the Regional Working Group shall elect, from amongst the members, a Chairperson, Vice-Chairperson and Rapporteur to serve for one year. The rules state further that, officers shall be eligible for re-election no more than once. Mr. Sudariyono, Dr. Pham Van Ninh, and Dr. Pornsook Chongprasith, who have served as Chairperson, Vice-Chairperson and Rapporteur, respectively, during 2002 are therefore all eligible for re-election.

2.1.2 The meeting fully recognised the good work that have been done by the ex-officers of the Regional Working Group. However, the members of the Regional Working Group felt that during the

first two years of the project, it would be appropriate that the focal points from the participating countries should have equal opportunity to serve the Regional Working Group as its officers. It was agreed that a new Chairperson, Vice-Chairperson and Rapporteur should be elected.

2.1.3 Dr. Pham Van Ninh, Focal Point for Land-based Pollution from Viet Nam nominated Mr. Han Baoxin, Focal Point for Land-based Pollution from China, as Chairperson of the Regional Working Group. The nomination was accepted by the meeting, and Mr. Han was elected by acclamation.

2.1.4 Dr. Pornsook Chongprasith, Focal Point for Land-based Pollution from Thailand nominated Mr. Vicente Diaz, Focal Point for Land-based Pollution from the Philippines, as Vice-Chairperson; with Mr. Han seconding the nomination. Mr. Diaz was elected as Vice-Chairperson by acclamation.

2.1.5 Mr. Pak Sokharavuth, Focal Point for Land-based Pollution from Cambodia nominated Mr. Mohamad bin Jaafar, Focal Point for Land-based Pollution from Malaysia, as Rapporteur. The nomination was seconded by the meeting, and Mr. Jaafar was elected as Rapporteur by acclamation.

2.2 Organisation of Work

2.2.1 The Chairman invited Mr. Jiang to brief the participants on the Provisional List of Documents (Document UNEP/GEF/SCS/RWG-LbP.3/Inf.2), the administrative arrangements for conducting the meeting, and the proposed organisation of work (UNEP/GEF/SCS/RWG-LbP.3/Inf.3). Mr. Jiang apologised for the delayed distribution of certain documents, and noted that the document UNEP/GEF/SCS/RWG-LbP.3/5 did not include the site characterisation of China, Malaysia and the Philippines, because their data were not provided in the format agreed by the Regional Working Group. The final List of Documents is contained in Annex 2 of this report.

2.2.2 The Regional Working Group agreed that the meeting will be conducted in plenary as far as possible, and that the meetings will commence each day at 8.00 a.m. Sessional working groups were formed, as deemed necessary. The meeting was conducted in English.

3. ADOPTION OF THE MEETING AGENDA

3.1 The Chairperson invited the participants to consider the Provisional Agenda prepared by the Secretariat (Document UNEP/GEF/SCS/RWG-LbP.3/1), and invited them to propose any amendments or additional items for consideration.

3.2 In responding to a question raised by Mr. Diaz, Mr. Jiang referred to the Agenda Item 9 and informed the meeting that the two World Bank proposals were received by the PCU. The Regional Working Group was invited to comment on these proposals, with a view to explore the possibilities of co-ordination and cooperation with these projects.

3.3 Mr. Agus Rusly suggested that the meeting should discuss the potentiality of co-ordination and co-operation with the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA/LBA). The Senior Expert informed the meeting that this discussion had been carried out during the first meeting of the Regional Working Group, but further discussion could be carried out under Agenda Item 12 of this meeting. Dr. Pornsook suggested that, under Agenda Item 12, co-operation with other projects/agencies should also be discussed; in particular, PEMSEA and the ASEAN Working Group on Coastal and Marine Environment.

3.4 The agenda was adopted with the modifications mentioned above, and is attached as Annex 3 to this report.

4. OPENING REMARKS FROM THE FOCAL POINTS FOR LAND-BASED POLLUTION FROM EACH PARTICIPATING COUNTRY

4.1 The Chairperson invited the focal points from the participating countries to provide short overviews of their progress subsequent to the second RWG meeting, and to highlight any additional documentation that they wished to table at the meeting.

4.2 Dr. Pornsook reported that Thailand had submitted its reports in May 2003 on past and ongoing activities in Thailand. Thailand had also completed its review of national data and information, the meta-database and the GIS database, and site characterisation of Land-Based Pollution, criteria for prioritisation of hot spots, and causal chain analysis of pilot activities.

4.3 Mr. Diaz apologised for not being able to organise this meeting in the Philippines due to the government's regulation on SARS. He hoped that a future meeting could be held in the Philippines. He also apologised for the delay in submitting the national report, but promised to meet deadlines in future. He informed the meeting the national report was submitted to the PCU.

4.4 Mr. Sokharavuth reported that Cambodia had submitted its reports on review of past and on-going projects, finalised the review on legal framework, selected three hot spots, and finalised causal chain analysis.

4.5 Dr. Ninh reported that Viet Nam has submitted its national reports, made progress in identifying characteristics, criteria and existing regulations, and developed and collected data for its hot spots. Vietnam is also continuing to develop its national database and meta-database. He informed the meeting that causal chain analysis is being carried out in Viet Nam.

4.6 Mr. Rusly reported the establishment of a national committee for Land-Based Pollution; proposing 3 areas as hot spots – Batam, Coast of west Kalimantan and the Jakarta Bay. Some meetings of the national committee have been convened and primary data have been collected for site characterisation. The implementation of the project activities was generally within the timeframe and deadlines.

4.7 Mr. Jaafar reported that, with the delay in signing the MOU, work only commenced early this year. So far, a committee on the national level has been established. A preliminary report has been submitted. A report will be submitted to PCU when it is available.

4.8 Mr. Han reported that China completed the national reports covered 3 major coastal areas: the Ling Ding Yang catchments of Pearl River Estuary, the Da Ya Bay, and the Bei Hai city coastal areas. China has just finished developing its meta database.

5. REPORTS FROM THE PROJECT CO-ORDINATING UNIT (PCU) REGARDING OVERALL PROGRESS TO DATE

5.1 Status of End-Year Progress Reports, Expenditure Reports and Budgets

5.1.1 The Chairperson invited Mr. Jiang to introduce Document UNEP/GEF/SCS/RWG-LbP.3/4, which summarised the current status of budgets and reports from the Specialised Executing Agencies in the participating countries. He reported that due to the delays in the appointment of PCU staff, 22% of PCU staff-time had been lost in 2002. The delay in signing of MOUs with Malaysia had also resulted in slow disbursement. In general, the implementation of the project activities is quite healthy, even though some problems still need to be resolved. He presented Table 1 of the document, which explained the status of submission of the half yearly reports by the PCU. He pointed out that the unfamiliarity of focal points with the format and process of submission of six monthly reports had caused some initial problems for the first half of 2002, but that the second half yearly reports had experienced much more delay. He called the attention of the focal points on this important matter.

5.1.2 The Mr. Jiang reminded the meeting that Specialised Executing Agencies (SEAs) should prepare the auditing reports covering the entire year 2002. Without this report, it will not be possible to disburse the budget for 2nd half of 2003, as this had been requested by the UN Auditor.

5.1.3 Mr. Jiang explained Table 2 of the document and the status of the revised budgets and government co-financing contributions, which were based on the half yearly reports from the participating countries and on the cost coefficient agreed by the Project Steering Committee.

5.1.4 With some clarifications, the meeting instructed the focal points from participating countries to ensure the timely submission of the half yearly reports, as agreed by the Project Steering Committee.

5.2 Status of planned substantive outputs from the national level activities

5.2.1 In introducing the document UNEP/GEF/SCS/RWG-LbP.3/6, Mr. Jiang explained that the background of the document was based on the agreements of the first and second RWG meetings. He informed the meeting that, for some countries, the reports were not prepared and provided in the agreed formats; and that this would cause problems in the comparability of the data and information generated from this project.

5.2.2 He referred to the PSC decision to conduct independent peer reviews of the national reports prepared under this project. He noted that it is important for this meeting to determine the closing deadline for the national reports so that independent reviews can be initiated.

5.2.3 He pointed out that previously established deadlines by the Regional Working Group have not been met and, therefore, it would be more pragmatic to establish realistic deadlines that can be maintained. He suggested to the meeting that the deadlines for the final submission of the national reports be considered together with the Regional Working Group's work plan in the Agenda Item 10.

5.2.4 The meeting agreed to consider this issue together with the revision of the work plan.

6. CHARACTERISATION OF HOT SPOTS

6.1 The Chairperson invited the Focal Points from the participating countries to give presentations on their updated information on the hot spot characterisations.

6.2 The meeting was informed that the site characterisation data and information provided in the document folder did not include those from China, Philippines and Malaysia. These had not been provided in the agreed format, and it was difficult to abstract data from the reports submitted. He informed the meeting that as these reports will provide the basis for the prioritisation and ranking of the potential pilot activities, it is necessary to re-format their data reports in the evening so that they can be included substantively in the prioritisation and ranking procedure.

6.3 Dr. Pornsook reported that, in Thailand, two hot spots were selected in the Gulf of Thailand. She explained the basis upon which these hot spots were selected. For the Upper Gulf of Thailand and east coast, additional information were obtained pertaining to (i) the area population was determined, reflecting the significance of the 4 rivers/river basins in this area; (ii) impact upon coastal waters measured against 17 parameters, including sediment quality, heavy metal concentration, mangrove decline, coral reef/seagrass condition, threatened species, mode of transportation; (iii) contaminant load; (iv) food safety; and (v) socio-economic development. Additional information was provided on the Songkhla Lake Basin, including contaminant load and socio-economic development. The agreed issues of regional and global significance were taken into consideration for the both proposed hot spots.

6.4 Mr. Jiang pointed out that, importantly, Thailand had considered: (i) the impact of the hot spots upon marine habitats and human health; and (ii) the identification of the sources of pollution; which would be very useful information for selecting appropriate activities to address the pollution problem.

6.5 Mr. Sokharavuth reported that Cambodia had selected three hot spots – Kampot, Koh Kong and Sihanoukville; describing the results of characterisation analyses conducted, as presented in the document UNEP/GEF/SCS/RWG-LbP.3/5 Cam.

6.6 Dr. Ninh reported that five hot spots have been proposed in Viet Nam, and the outcomes of the characteristic analyses have been reviewed. He informed the meeting that some difficulties had been encountered in obtaining the necessary data on the sources of pollutants; and regretted that some outcome was not reported in the required agreed format.

6.7 Mr. Diaz reviewed the three selected hot spots in the Philippines facing the South China Sea - Batangas Bay, Lingayen Gulf and Manila Bay - which have been identified in the report submitted to the PCU.

6.8 Referring to the case of Batangas Bay, Mr. Jiang reminded the meeting of the importance of the review of past and ongoing projects in order to be able to better evaluate the appropriateness of selected hot spots. He pointed out that as the report of the review of past and on-going projects from the Philippines had not been received, the project outcomes from a GEF-funded demonstration project were not clearly identified. Therefore, it would be appropriate that justifications be provided before the GEF project grant be used in that area again.

6.9 Mr. Rusly reviewed and discussed the three proposed Indonesian hot spots facing the South China Sea - Batam Island, West Coast of Kalimantan and Jakarta Bay. The relevant data and information on the site characterisation were also presented to the meeting.

6.10 Mr. Jaafar reported that so far Malaysia had only submitted a preliminary report and therefore could not present their data in the agreed format. He discussed very briefly the ongoing work being performed on five hot spots in Sabah but that he would follow-up to ensure timely delivery of their contributions. Mr. Jiang pointed out that Malaysia is still behind the schedule of the implementation of the project activities. Therefore, the RWG-LbP needed to decide on appropriate measures to encourage Malaysia to comply with the agreed schedule and deliverables.

6.11 Apologising for China's presentation not being in the agreed format, Mr. Han discussed at length the catchment area of the Pearl River, including the Ling Ding Yang Coastal area, the Da Ya Bay and the coastal area of Bei Hai city. It was agreed that China should present the involved data in the agreed format so as to facilitate easier and more compatible analysis in line with other hot spots.

7. CRITERIA FOR PRIORITISATION OF HOT SPOTS

7.1 The Chairperson invited Mr. Jiang to present the document UNEP/GEF/SCS/RWG-LbP.3/7, "*Proposed Regional Criteria and Procedure to be Used in Ranking and Selecting Pilot Activities for the Land-based Pollution Component*", which included a tabular format for identifying the major hot spots and associated problems in the South China Sea marine basin.

7.2 Mr. Jiang briefly introduced the three-step procedure that was being used for the habitat component of the South China Sea project. He noted that a different approach had to be developed for land-based pollution, as the pilot activities have very different features from the demonstration sites of the habitat component. Based on consultations with Dr. Wattayakorn, a format-table had been prepared. He explained to the meeting that this format was prepared based on the agreements of the first and second meetings of the Regional Working Group; in particular, the regional format for site characterisation.

7.3 He explained to the meeting that the major considerations should be given to (i) where the hot spots would be; (ii) what would be the major pollution problem in the hot spots identified and (iii) what kind of realistic activities would be proposed to address the problem. He further noted that if the meeting agreed with the proposed method for identifying and ranking the hot spots, the Regional Working Group should carefully study the weighting system proposed, amend and agree on the procedure.

7.4 Dr. Pornsook agreed that the Regional Working Group could use the proposed format and procedure to carry out the initial analysis. It would be necessary to discuss and modify the format and procedure while inputting the data and information into the proposed format.

7.5 Mr. Lohwongwatana asked how would this format deal with characteristics for which "no information" is available. Mr. Jiang responded that it would be better to address this issue when we have all the data from all countries, and when the problem appears. He further noted that there is no "perfect" format in this exercise, but the Regional Working Group need to find a better one.

7.6 All members were provided with electronic and hardcopy versions of the proposed table-format. The meeting agreed to use the format for the ranking exercise so that, during the evening, they could complete the new table format to rank the proposed hot spots. It was also pointed out that the focal points who did not prepare their data in agreed format would first have to do so in order to be able to expediently participate in the ranking exercise on the second day.

7.7 All focal points completed their table-formats in the agreed format for the analysis to be carried out under the Agenda Item 7. After inputting all data from the focal points, the Chairperson invited Mr. Jiang to present the table-format and introduce the results in the analysis using the data complied, and corrected some errors in the data table.

7.8 Dr. Pornsook made a number of suggestions on enhancing the validity and usefulness of the components of the table-format, including the weighting scheme for the indicators and parameters.

7.9 Discussing the weighting scheme, Dr. Wattayakorn suggested that weighting by indicator grouping would be sufficient and that weighting by specific component individual criteria components may not have much added value or accuracy.

7.10 Dr. Pornsook reminded the meeting that this exercise should be considered in terms of how it will enable the meeting to move forward to the next step of identifying activities. Therefore, it would not be good enough to only give the weighting to the indicator groups.

7.11 After extensive discussion of the proposed weighting scheme and review of the outcomes of the analysis, the meeting decided not to use the weight for the indicators and parameters as it would complicate the process. The agreed format is attached as Annex 4 to this report.

7.12 In order to ensure the quality of the data and information reflected in the data table, Mr. Jiang suggested that the meeting should review the completed table-format to verify and confirm the incorporated data. The meeting accepted the suggestion, and invited Dr. Wattayakorn to highlight data that seemed questionable. Responding to the comments by Dr. Wattayakorn on various seeming data discrepancies, the meeting carefully discussed the data contained in the table-format and made necessary corrections.

7.13 The final result of analysis was discussed amended and agreed by the meeting; and are attached as Annex 5 to this report.

8. CONSIDERATION OF PILOT ACTIVITIES ON LAND-BASED POLLUTION

8.1 Identification of Potential Pilot Activities

8.1.1 In introducing this agenda item, Mr. Jiang reminded the meeting again that consideration on the prioritisation and ranking of the pilot activities for this project component need to jointly consider: (i) identifying hot spot locations, (ii) the nature of the pollution problem, and (iii) the actions to address the problems.

8.1.2 Mr. Jiang presented a summary of outcome provided as Annex 5, based on the results of the ranking exercise, carried out in Agenda Item 7. This summary of outcome ranked the hot spots by their resultant scores according to the criteria and indicators agreed by the Regional Working Group, and its respective three highest ranked problems.

8.1.3 Mr. Jiang reported that some focal points had indicated that it would be more appropriate to propose relevant activities to address the identified problem after the completion of their causal chain analysis and cost benefit analysis, which will be included in the proposals for the pilot activities. He further indicated that the actions identified at the meeting would be in the different level of consideration in the proposal.

8.1.4 Dr. Lohwongwatana suggested that each focal point should present his proposed identified activities to address the pollution problems in the proposed hot spots, so that the meeting may review and discuss with the objective of identifying those that can be implemented by the project.

8.1.5 Each focal point then presented the possible activities in the proposed hot spots. While reviewing the outcomes of the proposed activities to address the identified pollution problems, Mr. Jiang reminded the meeting that some of the proposed activities would not fall within the project scope. The Regional Working Group should be pursuing technical solutions at this moment, but not the policy issues.

8.1.6 After the review of the possible activities proposed at the meeting, the meeting felt that some focal points did not have enough information on what kind of activities should be planned to address the pollution problems in the proposed hot spots. It was necessary to carry out the causal chain analysis, to identify the root cause of the pollution problems, and then decide what kind of activities should be carried out.

8.1.7 The meeting further agreed upon the results of the ranking exercise, and decided that there was no need to remove any hot spot from the list as it already presented the priorities agreed by the Regional Working Group. The focal points will select hot spots, together with associated pollution problems, to prepare pilot activity proposals.

8.2 Preparation of Proposals for Pilot Activities

8.2.1 The Chairperson invited Mr. Jiang to introduce the agenda item, with the reference to the document UNEP/GEF/SCS/RWG-LbP.3/8, "*Guidelines for Preparation of Pilot Activities in the Identified Hot Spot and the Format for Use in Their Presentation*". Mr. Jiang introduced the document indicating that it was self-explanatory. For the easy discussion and understanding, he went through the document section by section, and noted that quite substantial work may be involved in preparing the proposals.

8.2.2 Dr. Pornsook asked a question regarding the approval of the proposal by the provincial government. Mr. Jiang stated that the agreement and support of the provincial and local governments would ensure the successful implementation of the project activities. However, different country would have different procedures to get the project proposal approved. The format of the support from the provincial and local governments would depend on the situations in the participating countries.

8.2.3 Mr. Jiang drew attention of the meeting to Section 15 in the proposed format, "*Estimated Budget*". He indicated that two parts of budget estimations needed to be considered, one coming from the GEF grant, and the other from other budgetary sources.

8.2.4 With explanations and clarifications on the proposed format, the meeting agreed to use the format as the regional format to prepare the pilot activity proposal.

9. REVIEW OF PROPOSED WORLD BANK ACTIVITIES RELATING TO LAND BASED POLLUTION IN THE SOUTH CHINA SEA REGION

9.1 Protecting the Environment from the Impact of the Growing Industrialization of Livestock Production in East Asia

9.1.1 The Chairperson invited Mr. Jiang to introduce the document UNEP/GEF/SCS/RWG-LbP.3/inf. 4, which presented a World Bank proposal for a GEF project on the management of livestock waste in three countries (China, Thailand & Viet Nam) bordering the South China Sea. He introduced the project and invited the Members to address and advise on the following matters:

- Is industrialised livestock production a major source of land-based pollution in the South China Sea region?
- Are the proposed locations of the activities associated with any identifiable "hot spot" of pollution in the South China Sea?

- Will this project, if implemented have a measurable impact on nutrient levels in the identified hot spot of pollution?
- In what way should the RWG-LbP and the focal points in the three countries co-operate and co-ordinate activities undertaken in the framework of the UNEP/GEF Project and this project?

9.1.2 Dr. Pornsook stated that since the questions were referred to the South China Sea marine basin, the discharge from livestock contributed Nitrogen and Phosphate to the marine environment. The current data and information could only indicate the percentage of the contribution in the separate areas, but it was difficult to provide general information covering entire South China Sea coastal areas.

9.1.3 After listening to the views of the focal points from China, Thailand and Viet Nam, the countries involved in the World Bank proposal, the meeting felt that:

(i) industrialised livestock contributed to the nutrient discharge in the South China Sea marine basin;

(ii) the proposed location of the activities are associated with some identified hot spots of land-based pollution in the South China Sea project;

(iii) the implementation of the project activities would have a measurable impact on nutrient levels in the identified hot spots of pollution; and

(iv) the Regional Working Group expressed, in principle, its willingness to co-operate with the proposed project if it is approved. The practical co-operation should wait for the final approval of that project, and after the relevant work programme has been developed.

9.2 Concept on Pearl River Delta Urban Environment Project

9.2.1 The Chairman invited Mr. Jiang to brief the meeting on the status of another World Bank proposal for a GEF project concept, presented in Document UNEP/GEF/SCS/RWG-LbP.3/INF.5, relating to the Pearl River Delta Urban Environment. He invited the members of the Regional Working Group to consider whether or not this proposal would meet the objectives of the UNEP/GEF project in the Pearl River Delta hot spot.

9.2.2 Mr. Han commented on the developments occurring in the Pearl River Delta region. He indicated that the World Bank proposal would deal with wastewater treatment facilities in the large cities of the Pearl River delta, which would be useful activities to control the pollutants discharge. The proposed activities in the Pearl River hot spot under the UNEP/GEF South China Sea project would focus on other intervention to address pollution problems and the impact of pollutants to marine environment and marine habitats.

9.2.3 The meeting felt that the planned activities on establishing and improving the wastewater treatment plants in the large cities would be complementary with the activities undertaken by the South China Sea project. The meeting asked the PCU to have close communication with World Bank on the development of this project.

10. REVISION OF THE WORK PLAN AND ACTIVITIES FOR THE REGIONAL WORKING GROUP ON LAND-BASED POLLUTION

10.1 The Chairperson invited the Members to review and revise the work plan, taking into account the discussions and agreements reached under prior agenda items of this meeting. It was pointed out that, during the first and second meetings of the Regional Working Group, work plans and timetables were developed and agreed, but that some countries were unable to meet the scheduled submission deadlines of outputs. In this respect, the members were urged to be realistic in agreeing upon the timelines and schedule for submission of outputs and subsequently to make every effort to ensure that the deadlines will be met. It was emphasised that this was critical, as all proposals have to be in final

form in advance of the Regional Scientific Conference, if these are to be presented to donors in an acceptable form.

10.2 Dr. Wattayakorn asked if Malaysia would have a problem to maintain this schedule. Mr. Jaafar responded that they will try to meet the November 14th and 21st deadlines for submission of the proposal for the pilot activities. For the national reports, including review of past and on-going project, the reviews of national legal framework and the site characterisations, he expressed that he will try his best to finish them earlier.

10.3 The meeting agreed to the revised work plan and deadlines proposed and discussed, which is attached as Annex 6 to this report. With the agreed work plan, Mr. Jiang emphasised the critical importance of the deadlines for the submission of the draft and final proposals. If countries miss either of these deadlines, their proposals will not be considered by the Regional Working Group at the next meeting and will not included in the project activities.

11. DATE AND PLACE OF THE NEXT MEETINGS OF THE REGIONAL WORKING GROUP ON LAND-BASED POLLUTION

11.1 The Chairperson invited the Members to consider and agree upon the proposed time for the fourth meeting of the Regional Working Group for Land-Based Pollution. Mr. Jiang informed the meeting that based on the scheduled dates of the 4th meeting of the Regional Scientific and Technical Committee, the Regional Scientific Conference, and the 3rd Meeting of the Project Steering Committee, the dates of January 12th - 15th, 2004 were proposed by the PCU for the next meeting of RWG-LbP. He further indicated that the key task for the 4th meeting of RWG-LbP will be to review the proposals on the pilot activities.

11.2 Some members of the REG-LbP proposed that the 4th RWG-LbP meeting be held in Guangzhou, China. Mr. Han offered to make the necessary arrangements to host the meeting.

11.3 With appreciation to the Focal Point of China, the meeting agreed that the 4th meeting of the Regional Working Group would be organised in Guangzhou, China during 12th - 15th January 2004.

12. ANY OTHER BUSINESS

12.1 The Chairperson invited the members to consider and raise any other matters for discussion under this agenda item. Mr. Jiang reminded the meeting that the discussion of co-operation and co-ordination with the activities of GPA/LBA, ASEAN Working Group for Coastal and Marine Environment and PEMSEA have been added to the agenda.

12.2 Mr. Jiang informed the meeting that co-operation with Regional Programme of Action on GPA had already been considered in the first RWG-LbP meeting. It was agreed that the South China Sea project would focus on the impacts of land-based pollution in marine environment and marine habitats. The Regional Programme of Action will focus on the sources of land-based pollution. The activities under both projects are ongoing.

12.3 Dr. Pornsookreported that the ASEAN Working Group has an objective to harmonise hot spot definitions; and had asked Dr. Pornsook to convey their desire to have a meeting together with PEMSEA and South China Sea Project to discuss this issue.

12.4 Mr. Jiang responded that there are no discrepancies in the hot spot definitions used by GPA and South China Sea Project. Mr. Jiang commented that, for the purpose of holding such a meeting during the occasion of the East Asian Seas Congress, it would be appropriate to more clearly define the purpose of the meeting, instead of discussing only the definitions of hot spot. Dr. Pornsook believed that such a meeting during the East Asian Seas Congress in Kuala Lumpur would be expedient because all relevant parties will be present, and the meeting can be held on the periphery of the Congress meetings. As most RWG members were not presently assured of attending the East Asia Seas Congress, the meeting requested the PCU to explore the possibility of having such a meeting.

13. ADOPTION OF THE REPORT OF THE MEETING

13.1 The Rapporteur presented the draft report of the meeting. The meeting report was discussed, amended and adopted, as contained in this document.

14. CLOSURE OF THE MEETING

14.1 The Chairperson thanked all members of the Regional Working Group for their hard work during the four days meeting. He also thanked the PCU staff for preparation of the meeting documents and arrangements for the meeting.

14.2 On behalf of the PCU, Mr. Jiang thanked all members of the Regional Working Group for their constructive contribution to ensure the success of the meeting.

14.3 On behalf of all members of the Regional Working Group, Dr. Pornsook thanked the Chairperson and the PCU staff for their hard work. She wished all participants a safe journey back home.

14.4 The Chairperson closed the meeting at 16:00 hours, on 10 July 2003.

ANNEX 1

List of Participants

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ANNEX 2

List of Documents

Working Documents

UNEP/GEF/SCS/RWG-LbP.3 /1	Provisional agenda.
UNEP/GEF/SCS/RWG-LbP.3/2	Provisional annotated agenda.
UNEP/GEF/SCS/RWG-LbP.3/3	Report of the meeting.
UNEP/GEF/SCS/RWG-LbP.3/4	Status report of the Secretariat concerning the second six-month reports from the participating countries.
UNEP/GEF/SCS/RWG-LbP.3/5 Cam	Report of the Characterisation of Hot Spots from Cambodia.
UNEP/GEF/SCS/RWG-LbP.3/5 Chi	Report of the Characterisation of Hot Spots from China.
UNEP/GEF/SCS/RWG-LbP.3/5 Ind	Report of the Characterisation of Hot Spots from Indonesia.
UNEP/GEF/SCS/RWG-LbP.3/5 Mal	Report of the Characterisation of Hot Spots from Malaysia.
UNEP/GEF/SCS/RWG-LbP.3/5 Phi	Report of the Characterisation of Hot Spots from Philippines.
UNEP/GEF/SCS/RWG-LbP.3/5 Tha	Report of the Characterisation of Hot Spots from Thailand.
UNEP/GEF/SCS/RWG-LbP.3/5 Viet	Report of the Characterisation of Hot Spots from Viet Nam.
UNEP/GEF/SCS/RWG-LbP.3/6	Summary of data and information received for the characterisation of Hot Spots from the participating countries during the 2nd Meeting of RWG-LbP.
UNEP/GEF/SCS/RWG-LbP.3/7	Proposed regional criteria and procedures to be used in ranking and selecting pilot activities for the Land-based Pollution Component.
UNEP/GEF/SCS/RWG-LbP.3/8	Guidelines for the preparation of potential pilot activities and format for use in their presentation.

Information documents

UNEP/GEF/SCS/RWG-LbP.3/Inf.1	Provisional list of participants.
UNEP/GEF/SCS/RWG-LbP.3/Inf.2	Provisional list of documents.
UNEP/GEF/SCS/RWG-LbP.3/Inf.3	Draft programme.
UNEP/GEF/SCS/RWG-LbP.3/Inf.4	World Bank Project entitled: "*Protecting the Environment from the Impact of the Growing Industrialization of Livestock Production in East Asia".*
UNEP/GEF/SCS/RWG-LbP.3/Inf.5	World Bank concept entitled *"Urban waste management in the Pearl River Delta".*

The following documents are supplied on CD-ROM and in hard copies.

UNEP/GEF/SCS/RWG-M.2/3	Second Meeting of the Regional Working Group on the Mangroves Sub-component for the UNEP/GEF Project *"Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand".* Report of the meeting. Ho Chi Minh City, Viet Nam, *10 - 13 September 2002.* UNEP/GEF/SCS/RWG-M.2/3.

UNEP/GEF/SCS/RWG-W.2/3	Second Meeting of the Regional Working Group on the Wetlands Sub-component for the UNEP/GEF Project *"Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand*". Report of the meeting. Shenzhen, China*, 4 - 7 September 2002.* UNEP/GEF/SCS/ RWG-W.2/3.
UNEP/GEF/SCS/RWG-LbP.2/3	Second Meeting of the Regional Working Group on the Land-based Pollution Component for the UNEP/GEF Project *"Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand".* Report of the meeting. Batam, Indonesia, *18 - 21 September 2002.* UNEP/GEF/ SCS/RWG-LbP.2/3.
UNEP/GEF/SCS/RWG-F.2/3	Second Meeting of the Regional Working Group on the Fisheries Component for the UNEP/GEF Project *"Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand".* Report of the meeting. Phuket, Thailand, *7 - 11 October 2002.* UNEP/GEF/SCS/RWG-F.2/3.
UNEP/GEF/SCS/RWG-CR.2/3	Second Meeting of the Regional Working Group on the Coral Reef Sub-component for the UNEP/GEF Project *"Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand".* Report of the meeting. Sihanoukville, Cambodia, *23 - 26 October 2002.* UNEP/GEF/SCS/ RWG-CR.2/3.
UNEP/GEF/SCS/RWG-SG.2/3	Second Meeting of the Regional Working Group on the Seagrass Sub-component for the UNEP/GEF Project *"Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand".* Report of the meeting. Hue, Viet Nam, *28 - 31 October 2002.* UNEP/GEF/SCS/ RWG-SG.2/3.
UNEP/GEF/SCS/RSTC.2/3	Second Meeting of the Regional Scientific & Technical Committee for the UNEP/GEF Project *"Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand".* Report of the meeting. Nha Trang, Viet Nam*, 11 - 13 December 2002.* UNEP/GEF/SCS/RSTC.2/3.
UNEP/GEF/SCS/PSC.2/3	Second Meeting of the Project Steering Committee for the UNEP/GEF Project *"Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand".* Report of the meeting. Hanoi, Viet Nam, *16 - 18 December 2002.* UNEP/GEF/SCS/ PSC.2/3.

ANNEX 3

Agenda

1. OPENING OF THE MEETING
- **1.1 Welcome address**
- **1.2 Introduction of members**

2. ORGANISATION OF THE MEETING
- **2.1 Designation of officers**
- **2.2 Organisation of work**

3. ADOPTION OF THE MEETING AGENDA

4. OPENING REMARKS FROM THE FOCAL POINTS FOR LAND-BASED POLLUTION FROM EACH PARTICIPATING COUNTRY

5. REPORTS FROM THE PROJECT CO-ORDINATING UNIT (PCU) REGARDING OVERALL PROGRESS TO DATE
- **5.1 Status of end-year progress reports, expenditure reports and budgets**
- **5.2 Status of planned substantive outputs from the national level activities**

6. CHARACTERISATION OF HOT SPOTS

7. CRITERIA FOR PRIORITISATION OF HOT SPOTS

8. CONSIDERATION OF PILOT ACTIVITIES ON LAND-BASED POLLUTION
- **8.1 Identification of potential Pilot Activities**
- **8.2 Preparation of proposals for pilot activities**

9. REVIEW OF PROPOSED WORLD BANK ACTIVITIES RELATING TO LAND BASED POLLUTION IN THE SOUTH CHINA SEA REGION
- **9.1 Protecting the Environment from the Impact of the Growing Industrialization of Livestock Production in East Asia**
- **9.2 Concept on Pearl River Delta urban environment project**

10. REVISION OF THE WORK PLAN AND ACTIVITIES FOR THE REGIONAL WORKING GROUP ON LAND-BASED POLLUTION

11. DATE AND PLACE OF THE NEXT MEETING OF THE REGIONAL WORKING GROUP ON LAND-BASED POLLUTION

12. ANY OTHER BUSINESS

13. ADOPTION OF THE REPORT OF THE MEETING

14. CLOSURE OF THE MEETING

ANNEX 4

Agreed format for Characterisation and ranking of Pollution Hot Spots

1. Agreed Criteria

The Regional Working Group on Land-based Pollution for the UNEP GEF Project entitled *"Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand"* discussed and agreed on the criteria and procedures for characterising hot spots of pollution in the South China Sea marine basin.

It was agreed at its first meeting to use the ASEAN marine water quality criteria:

> *"The ASEAN marine water quality criteria[1] for two use types, human health and aquatic life including 17 key parameters were discussed and it was agreed that these parameters could be adopted for use as indicators of water quality within the framework of the hot spot analysis". (document UNEP/GEF/SCS/RWG-LbP.1/3, paragraph 7.6)*

At their second meeting the Regional Working Group further agreed on the standards of biological samples and sediment samples to be used in characterising sites:

> *"After discussion on the relevant standards of sediment and biological samples, the meeting agreed to use the relevant national standards of China as the standards for comparison of the data and information for this project. It was also highlighted that these standards used in the project do not imply any legal obligation".* (document UNEP/GEF/SCS/RWG-LbP.2/3, paragraph 6.2.6)

2. Agreed Format For Characterisation And Ranking Of Pollution Hot Spots

The Regional Working Group also agreed initial guidance for the national committees on land-based pollution, regarding criteria, indicators and information needs for the analysis of hot spots in the South China Sea and Gulf of Thailand (Annex 7 of the meeting report UNEP/GEF/SCS/RWG-LbP.1/3), and the regional format for site characterisation of hot spots (Annex 5 of the meeting report UNEP/GEF/SCS/RWG-LbP.2/3).

Based on the data and information received from the Focal Points for Land-based Pollution in the participating countries and discussion with the Regional Expert the proposed regional criteria and procedure to be used in ranking and selecting pilot activities for the land-based pollution component were prepared. The proposed format was presented, discussed, amended and agreed as it appears in Table 1. Using the data and information provided by Thailand during the second meeting of the regional working group an example was completed and these data are used to derive the examples in Figures 1, 2 and 3 of this annex.

Table 1 has site names on the top row and 5 categories of impact representing different levels of contamination defined according to the agreed *Regional Format for Site Characterisation of Hot Spots Identification within the Framework of the Land-based Pollution* (Annex 5, UNEP/GEF/SCS/RWG-LbP.2/3). Category 1 in the case of ambient water quality, sediment quality and biological samples indicates that no problem exists, for example water quality criteria are better that the ASEAN/China criteria. The left hand column lists the regional criteria, some of which are divided into indicators. "Impact on the Marine Environment" is measured in terms of impacts on: water quality; sediment quality; biological samples; changes in living marine organisms; and affected marine communities. Ambient water quality is itself defined in terms of: nutrients; faecal coliform bacteria; heavy metals and dissolved Oxygen.

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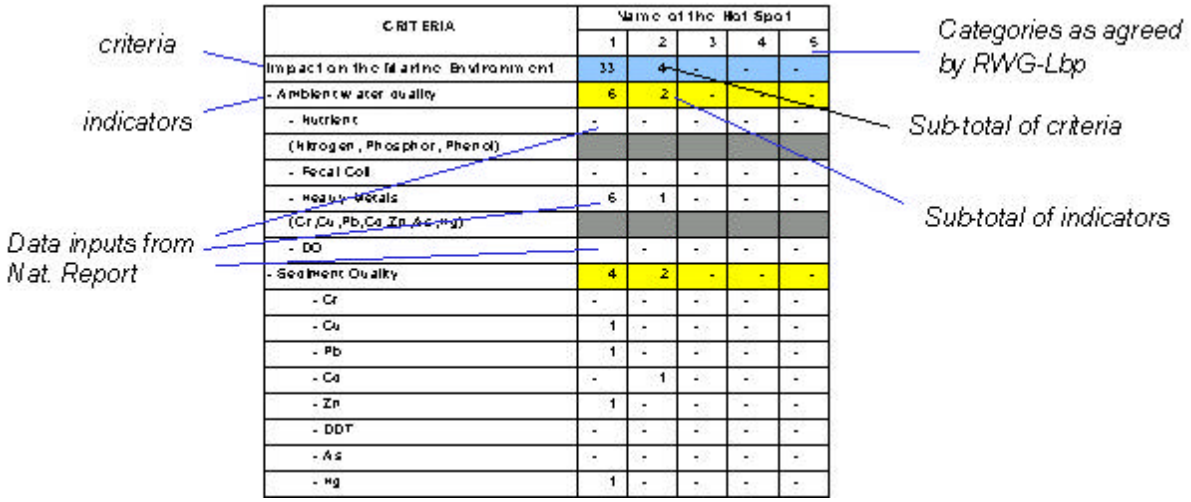
[1] *Developed under the ASEAN-Canada co-operative programme on marine science phase II and subsequently adopted during the ASEAN-UNEP Workshop on the Coastal and Marine Environments of Southeast Asia: Status and Opportunities for Regional Co-operation.*

Table 1. Agreed format for characterisation and priority ranking of pollution hot spots and contaminants

CRITERIA	Name of Hot Spot					Name of Hot Spot					Name of Hot Spot				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Impact on the Marine Environment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Ambient water quality	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Nutrient (Nitrate, Nitrite, Phosphate and Ammonia)															
- Fecal Coli															
- Heavy Metals (Cr,Cu,Pb,Cd,Zn,As,Hg), phenol															
- DO															
- Sediment Quality	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Cr															
- Cu															
- Pb															
- Cd															
- Zn															
- DDT															
- As															
- Hg															
- Biological samples	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Cr															
- Cu															
- Pb															
- Cd															
- Zn															
- DDT															
- As															
- Hg															
- Changes in living marine organisms	-	-	-	-	-	-	-	-	-		-	-	-	-	
- Affected marine community	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Mangrove															
- Coral reef															
- Wetland															
- Seagrass															
Regional and/or global significance	5	-	-	-	-	5	-	-	-	-	5	-	-	-	-
- Contaminant load	5					5					5				
- Affected population															
- Affected area (km2)															
- Affected species															
Transboundary Significance	-	-	-			-	-	-			-	-	-		
- Presence of contaminant from non local, non national sources (yes:1,															
- Potential mode of transportation of contaminant and extent of water movement															
- Groundwater	-	-	-			-	-	-			-	-	-		
- Air/rain fall	-	-	-			-	-	-			-	-	-		
- Water circulation	-	-				-	-				-	-			
(Satisfied:0; stressful:1)															
Human Health	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Food safety (including bacteria contaminant) (satisfied:0; not satisfied:1)															
- Sickness/disease (cases/year)															
Future Threats	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
development (yes:1 no:0)															
years)															
TOTAL					-					-					-

Figure 1 Example of data sheet for prioritisation using data & information provided by Thailand



CRITERIA	Name of the Hot Spot				
	1	2	3	4	5
Impact on the Marine Environment	33	4	-	-	-
- Ambient water quality	6	2	-	-	-
- Nutrient	-	-	-	-	-
(Nitrogen, Phosphor, Phenol)					
- Fecal Coli	-	-	-	-	-
- Heavy Metals	6	1	-	-	-
(Cr,Cu,Pb,Cd,Zn,As,Hg)					
- DO		-	-	-	-
- Sediment Quality	4	2	-	-	-
- Cr	-	-	-	-	-
- Cu	1	-	-	-	-
- Pb	1	-	-	-	-
- Cd	-	1	-	-	-
- Zn	1	-	-	-	-
- DDT	-	-	-	-	-
- As	-	-	-	-	-
- Hg	1	-	-	-	-

In this example we can see that the indicator of ambient water quality has six parameters meeting the standards used to define category 1. In one case (Cadmium) the levels exceed by 1 to 2 times the ASEAN/China water criteria. The categories are also used to weight the observed values. Hence category 1 values are simply summed to give a total of 6, whilst category 2 values (one in this example) are multiplied by two to give the value in the Ambient Water Quality row of the table. The criterion "Impact on the marine environment" is scored as the sum of the values for all indicators within the same criterion.

Identification of priority Hot Spots and their comparative importance

Bearing in mind that, the ranking of hot spots is required in order to prepare a short list of activities at specific sites for which, proposals need to be prepared, there is a need to characterise more sites in order to obtain a better regional overview. To determine the overall ranking of each hot-spot of pollution the sum of all values in categories 2 to 5 is provided at the bottom of Table 1. Since category 1 represents an acceptable environmental state it is not included in the totals used to determine the rank score for individual sites.

Figure 2 Extract from Table 1 illustrating the derivation of the rank score for pollution at a particular site

Human Health	5				
- Food safety (including bacteria contaminant)	Yes	No			
- Sickness/disease (cases/year)	5	-	-	-	-
Future Threats	2	-	-	-	-
- Socio-economic and culture development	-				
- Population growth (next 5 and 10 years)	2	-	-	-	-
TOTAL					31

Total for the level pollution of a hot spot

Identification of Major Contaminant/Pollution Problems and their comparative importance

Total scores for each contaminant can be summed across hot spots to show the comparative importance of the impact of the individual contaminant in the South China Sea marine basin. Again values in category 1 are disregarded in calculating to total rank score since these represent acceptable conditions of environmental state. The total of the values across all hot spots thus provides an indication of the regional importance of each specific contaminant based on their relative

importance at each of the selected sites. Pilot activities should be directed to contaminants or impacts of high regional importance.

Figure 3. Extract from Table 1 illustrating the derivation of the rank score for individual contaminants/impacts across all hotspots

CRITERIA	Name of the Hot Spot					Name of the Hot Spot					Name of the Hot Spot					TOTAL
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	
Impact on the Marine Environment	33	4	-	-	-	-	-	-	-	-	-	-	-	-	-	4
- Ambient water quality	6	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2
- Nutrient	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(Nitrogen, Phosphor, Phenol)																
- Fecal Coli	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Heavy Metals	6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
(Cr,Cu,Pb,Cd,Zn,As,Hg)																
- DO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Sediment Quality	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2

Total score of the type of problems

Conclusions

Having agreed the procedures the Regional Working Group proceeded to collate and analyse the data and the results are presented in Annex 5.

ANNEX 5

Results of Characterisation and Ranking of Hot Spots and Contaminant Impacts

Background

Following agreement on the form of the analysis of priority problems and sites of land-based pollution impact in the South China Sea marine basin (Annex 4), the Regional Working Group on Land-based Pollution compiled and discussed the available data. Individual members of the group:

- Completed data sheets for the site characterisation;
- Checked the data used in the characterisation and ranking; and,
- Reviewed the preliminary results.

Results

The outcome of the compilation of the data is presented in Table 1 which was prepared and agreed during the meeting.

Table 2 presents a ranking of the hot spots based on the composite score for each site provided in Table 1. Score values for the individual hot spots range from 17 to 94 with a mean value of 47.

Based on the results in Table 1, the ranking of contaminant problems and their comparative importance in the South China Sea marine basin was determined as described in Annex 4. Table 3 presents a ranking of the contaminant problems and their comparative importance in the South China Sea marine basin. The contaminant problems and their comparative importance in the South China Sea marine basin appear to be as follows:

- From the identified 5 categories, the impact on water quality is apparently a major concern, followed by biological samples and sediment quality; and,
- From the view of contaminants, the rank of the major problems is (i) nutrient discharge, (ii) heavy metals in the sea water; heavy metals in biological samples, and heavy metals in sediment.

Table 1 Results of Characterisation and Ranking of Hot Spots

CRITERIA	QUANG NINH - HAI PONG					VUNG TAU - GANH RAI					DA NANG - DUNG QUAT				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Impact on the Marine Environment	14	20	12	8	-	7	10	9	4	-	11	6	12	-	-
- Ambient water quality	7	6	6	-	-	5	6	6	4	-	3	4	9	-	-
- Nutrient (Nitrate, Nitrite, Phosphate and Ammonia)	2	1	1		-	1	1	1	1	-		1	1	-	-
- Fecal Coli	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
- Heavy Metals (Cr,Cu,Pb,Cd,Zn,As,Hg), phenol	4	2	1	-	-	3	2	1	-	-	2	1	1	-	-
- DO	1	-	-	-	-	1	-	-	-	-	1	-	-	-	-
- Sediment Quality	3	6	3	-	-	2	4	3	-	-	4	2	3	-	-
- Cr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Cu	1	-	-	-	-		1	-	-	-	1	-	-	-	-
- Pb	1	-	-	-	-	-	1	-	-	-	1	-	-	-	-
- Cd	-	-	1	-	-	-	-		-	-	-	1	-	-	-
- Zn		1	-	-	-	1	-	-	-	-	1	-	-	-	-
- DDT	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- As		1	-	-	-	1	-	-	-	-	1	-	-	-	-
- Hg		1	-	-	-	-	-	1	-	-		-	1	-	-
- Biological samples	-	4	3	8	-	-	-	-	-	-	4	-	-	-	-
- Cr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Cu	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
- Pb	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
- Cd	-	-	-	-		-	-	-	-	-	1	-	-	-	-
- Zn	-	-	1		-	-	-	-	-	-	-	-	-	-	-
- DDT		1	-	-	-	-	-	-	-	-	1	-	-	-	-
- As	-	1		-	-	-	-	-	-	-	-	-	-	-	-
- Hg	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-
- Changes in living marine organisms	2	4	-	-	-	-	-	-	-		-	-	-	-	
	2	2													
- Affected marine community	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Mangrove	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Coral reef	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Wetland		-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Seagrass	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Regional and/or global significance	5	-	-	4	5	5	-	3	4	-	5	-	3	-	5
- Contaminant load	5					5					5				
- Affected population		-	-	-	1		-	-	1	-		-	-	-	1
- Affected area (km2)		-	-	1	-		-	1	-	-		-	1	-	-
- Affected species	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transboundary Significance	-	-	3			-	-	3			-	-	3		
- Presence of contaminant from non local, non national sources (yes:1, no:0)	0					0					0				
- Potential mode of transportation of contaminant and extent of water movement	-	-	3			-	-	3			-	-	3		
- Groundwater	-	-	-			-	-	-			-	-	-		
- Air/rain fall	-	-	-			-	-	-			-	-	-		
- Water circulation	-	-	1			-	-	1			-	-	1		
- Quality of migratory species (Satisfied:0; stressful:1)	0					0					0				
Human Health	-	-	-	-	5	-	-	-	-	-	-	-	-	-	5
- Food safety (including bacteria contaminant) (satisfied:0; not satisfied:1)	0														
- Sickness/disease (cases/year)		-	-	-	1	-	-	-	-	-		-	-	-	1
Future Threats	1	-	3	-	-	1	2	-	-	-	1	-	3	-	-
- Socio-economic and culture development (yes:1 no:0)	1					1					1				
- Population growth (next 5 and 10 years)			1	-	-		1	-	-	-			1	-	-
	20	20	18	12	10	13	12	15	8	-	17	6	21	-	10
TOTAL	**60**					**35**					**37**				

CRITERIA	THE UPPER GULF OF THAILAND					SONGKHLA LAKE BASIN					KAMPOT				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Impact on the Marine Environment	27	28	-	-	10	6	2	-	-	-	22	4	6	4	-
- Ambient water quality	9	4	-	-	10	1	2	-	-	-	7	4	6	4	-
- Nutrient (Nitrate, Nitrite, Phosphate and Ammonia)	1	2	-	-	1	-	-	-	-	-	2	-	1	1	
- Fecal Coli	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-
- Heavy Metals (Cr,Cu,Pb,Cd,Zn,As,Hg), phenol	7	-	-	-	-	1	1	-	-	-	4	1	1	-	-
- DO	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
- Sediment Quality	6	2	-	-	-	3	-	-	-	-	5	-	-	-	-
- Cr	1	-	-	-	-	1	-	-	-	-	1	-	-	-	-
- Cu	1		-	-	-	1	-	-	-	-	1	-	-	-	-
- Pb	1		-	-	-	-	-	-	-	-	1	-	-	-	-
- Cd		1	-	-	-	-	-	-	-	-	1	-	-	-	-
- Zn	1		-	-	-	1	-	-	-	-	1	-	-	-	-
- DDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- As	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Hg	1		-	-	-	-	-	-	-	-	-	-	-	-	-
- Biological samples	9	8	-	-	-	1	-	-	-	-	10	-	-	-	-
- Cr	-	1	-	-	-	-	-	-	-	-	2	-	-	-	-
- Cu	2	1	-	-	-	-	-	-	-	-	2	-	-	-	-
- Pb	1		-	-	-	-	-	-	-	-	2	-	-	-	-
- Cd	1	2	-	-	-	-	-	-	-	-	2	-	-	-	-
- Zn	3	-	-	-	-	-	-	-	-	-	2	-	-	-	-
- DDT	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-
- As	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Hg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Changes in living marine organisms	-	12	-	-		-	-	-	-		-	-	-	-	
	-	6	-	-											
- Affected marine community	3	2	-	-	-	1	-	-	-	-	-	-	-	-	-
- Mangrove	1			-	-	1	-	-	-	-	-	-	-	-	-
- Coral reef		1	-	-		-	-	-	-	-	-	-	-	-	-
- Wetland	1		-	-	-	-	-	-	-	-	-	-	-	-	-
- Seagrass	1	-		-	-	-	-	-	-	-	-	-	-	-	-
Regional and/or global significance	4	2	-	-	10	3	-	3	-	5	5	-	3	4	5
- Contaminant load	4					3					5				
- Affected population	-	-	-	-	1		-	-	-	1		-	-	1	-
- Affected area (km2)	-	-	-	-	1		-	1	-	-		-	1	-	-
- Affected species	-	1	-	-	-	-	-	-	-	-			-	-	1
Transboundary Significance	2	2	3			2	2	3			-	-	-		
- Presence of contaminant from non local, non national sources (yes:1, no:0)	1					1					0				
- Potential mode of transportation of contaminant and extent of water movement	1	2	3			1	2	3			-	-	-		
- Groundwater	1	-	-			1	-	-			-	-	-		
- Air/rain fall	-	1	-			-	1	-			-	-	-		
- Water circulation	-	-	1			-	-	1			-	-	-		
- Quality of migratory species (Satisfied:0; stressful:1)	0					0					0				
Human Health	-	-	-	-	5	-	-	-	-	5	-	-	-	4	-
- Food safety (including bacteria contaminant) (satisfied:0; not satisfied:1)	0					0					0				
- Sickness/disease (cases/year)	-	-	-	-	1	-	-	-	-	1		-	-	1	-
Future Threats	1	2	-	-	-	1	-	3	-	-	1	-	-	-	5
- Socio-economic and culture development (yes:1 no:0)	1					1					1				
- Population growth (next 5 and 10 years)	-	1	-	-	-		-	1	-	-		-	-	-	1
	34	34	3	-	25	12	4	9	-	10	28	4	9	12	10
TOTAL	**62**					**23**					**35**				

CRITERIA	KOH KONG					SIHANOUKVILLE					BATAM				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Impact on the Marine Environment	23	2	6	8	-	18	6	36	8	5	10	10	3	4	15
- Ambient water quality	7	2	6	8	-	5	6	3	8	5	5	2	3	4	10
- Nutrient (Nitrate, Nitrite, Phosphate and Ammonia)	2	-	1	1		1	1		1	1		1	1	-	
- Fecal Coli	1	-	-	-	-	1	-	-	-	-	-	-		-	1
- Heavy Metals (Cr,Cu,Pb,Cd,Zn,As,Hg), phenol	4	-	1	1	-	3	1	1	1	-	4	-	-	1	1
- DO	-	1	-	-	-	-	1	-	-	-	1	-	-	-	-
- Sediment Quality	5	-	-	-	-	3	-	3	-	-	2	2	-	-	5
- Cr	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-
- Cu	1	-	-	-	-	1	-	-	-	-	-	1	-	-	-
- Pb	1	-	-	-	-	1	-	-	-	-	1	-	-	-	-
- Cd	1	-	-	-	-		-	1	-	-	-	-	-	-	1
- Zn	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-
- DDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- As	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Hg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Biological samples	10	-	-	-	-	10	-	30	-	-	3	6	-	-	-
- Cr	2	-	-	-	-	2	-	2	-	-	-	-	-	-	-
- Cu	2	-	-	-	-	4	-	-	-	-	-	-	-	-	-
- Pb	2	-	-	-	-	-	-	4	-	-	-	-	-	-	-
- Cd	2	-	-	-	-	3	-	1	-	-	-	2	-	-	-
- Zn	2	-	-	-	-	1	-	3	-	-	2	-	-	-	-
- DDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- As	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Hg	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-
- Changes in living marine organisms	-	-	-	-		-	-	-	-		-	-	-	-	
- Affected marine community	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Mangrove	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Coral reef	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Wetland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Seagrass	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Regional and/or global significance	5	-	3	-	10	5	2	3	-	5	-	-	3	4	-
- Contaminant load	5					5					-				
- Affected population		-	1	-	-		-	1	-	-		-	-	1	-
- Affected area (km2)		-	-	-	1		1	-	-	-		-	1	-	-
- Affected species		-	-	-	1		-	-	-	1	-	-	-	-	-
Transboundary Significance	-	-	-			-	-	-			1	-	3		
- Presence of contaminant from non local, non national sources (yes:1, no:0)	0					0					1				
- Potential mode of transportation of contaminant and extent of water movement	-	-	-			-	-	-			-	-	3		
- Groundwater	-	-	-			-	-	-			-	-	-		
- Air/rain fall	-	-	-			-	-	-			-	-	-		
- Water circulation	-	-	-			-	-	-			-	-	1		
- Quality of migratory species (Satisfied:0; stressful:1)	0					0					0				
Human Health	-	-	3	-	-	-	-	-	4	-	-	-	-	-	5
- Food safety (including bacteria contaminant) (satisfied:0; not satisfied:1)	0					0					0				
- Sickness/disease (cases/year)		-	1	-	-		-	-	1	-		-	-	-	1
Future Threats	1	-	-	-	5	1	-	-	-	5	1	-	-	-	5
- Socio-economic and culture development (yes:1 no:0)	1					1					1				
- Population growth (next 5 and 10 years)		-	-	-	1		-	-	-	1		-	-	-	1
	29	2	12	8	15	24	8	39	12	15	12	10	9	8	25
TOTAL	**37**					**74**					**52**				

CRITERIA	WEST KALIMANTAN					DKI JAKARTA					Pearl River				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Impact on the Marine Environment	3	2	3	-	25	1	4	3	4	15	-	18	9	16	30
- Ambient water quality	3	2	3	-	25	1	4	3	4	15	-	4	3	4	20
- Nutrient (Nitrate, Nitrite, Phosphate and Ammonia)	-		1	-	3	-	-	1	1	2	-	1	1	1	1
- Fecal Coli	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
- Heavy Metals (Cr,Cu,Pb,Cd,Zn,As,Hg), phenol	2	1	-	-	2	-	2	-	-	1	-	1	-	-	1
- DO	1	-	-	-	-	1	-	-	-	-	-	-	-	-	1
- Sediment Quality	-	-	-	-	-	-	-	-	-	-	-	8	-	-	10
- Cr	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
- Cu	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
- Pb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
- Cd	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Zn	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
- DDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
- As	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Hg	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
- Biological samples	-	-	-	-	-	-	-	-	-	-	-	6	-	4	-
- Cr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Cu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Pb	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-
- Cd	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
- Zn	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- DDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- As	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Hg	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
- Changes in living marine organisms	-	-	-	-		-	-	-	-		-	-	-	4	
														1	
- Affected marine community	-	-	-	-	-	-	-	3	-	-	-	-	6	4	-
- Mangrove	-	-	-	-	-		-	1	-	-	-	-	1	-	-
- Coral reef	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Wetland	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
- Seagrass	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Regional and/or global significance	-	-	-	-	10	5	-	-	-	10	5	2	-	-	10
- Contaminant load	-					5					5				
- Affected population		-	-	-	1		-	-	-	1	-	-	-	-	1
- Affected area (km2)		-	-	-	1		-	-	-	1	-	-	-	-	1
- Affected species	-	-	-	-	-	-	-	-	-	-	-	1		-	
Transboundary Significance	1	-	-			-	-	-			1	-	3		
- Presence of contaminant from non local, non national sources (yes:1, no:0)	1					0					0				
- Potential mode of transportation of contaminant and extent of water movement	-	-	-			-	-	-			-	-	3		
- Groundwater	-	-	-			-	-	-			-	-	-		
- Air/rain fall	-	-	-			-	-	-			-	-	-		
- Water circulation	-	-	-			-	-	-			-	-	1		
- Quality of migratory species (Satisfied:0; stressful:1)	0					0					1				
Human Health	1	-	-	-	-	-	-	-	-	-	1	-	-	4	-
- Food safety (including bacteria contaminant) (satisfied:0; not satisfied:1)	1					0					1				
- Sickness/disease (cases/year)	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
Future Threats	1	-	3	-	-	2	-	-	-	-	1	2	-	-	-
- Socio-economic and culture development (yes:1 no:0)	1					1					1				
- Population growth (next 5 and 10 years)		-	1	-	-	1	-	-	-	-	-	1	-	-	-
	6	2	6	-	35	8	4	3	4	25	8	22	12	20	40
TOTAL	**43**					**36**					**94**				

CRITERIA	Daya Bay Catchment					Beihai Coast Catchment					Batangas Bay Region				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Impact on the Marine Environment	-	16	9	12	5	-	4	6	-	10	-	-	3	-	-
- Ambient water quality	-	2	3	8	-	-	4	-	-	-	-	-	3	-	-
- Nutrient (Nitrate, Nitrite, Phosphate and Ammonia)	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-
- Fecal Coli	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
- Heavy Metals (Cr,Cu,Pb,Cd,Zn,As,Hg), phenol	-	1	1	-	-	-	1	-	-	-	-	-	-	-	-
- DO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Sediment Quality	-	-	-	-	-	-	-	6	-	10	-	-	-	-	-
- Cr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Cu	-	-	-	-	-	-	-	1		-	-	-	-	-	-
- Pb	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
- Cd	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
- Zn	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- DDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- As	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Hg	-	-	-	-	-	-	-	1		-	-	-	-	-	-
- Biological samples	-	10	3	-	-	-	-	-	-	-	-	-	-	-	-
- Cr	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
- Cu	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
- Pb	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
- Cd	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
- Zn	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
- DDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- As	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
- Hg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Changes in living marine organisms	-	2	-	-		-	-	-	-		-	-	-	-	
		1													
- Affected marine community	-	2	3	4	5	-	-	-	-	-	-	-	-	-	-
- Mangrove	-		1	-	-	-	-	-	-	-	-	-	-	-	-
- Coral reef	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
- Wetland	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
- Seagrass	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Regional and/or global significance	5	-	9	-	-	5	-	3	-	10	4	2	-	4	-
- Contaminant load	5					5					4				
- Affected population	-	-	1	-	-	-	-	-	-	1		-	-	1	-
- Affected area (km2)	-	-	1	-	-	-	-	1	-	-		1	-	-	-
- Affected species	-	-	1		-	-	-		-	1	-	-	-	-	-
Transboundary Significance	1	-	3			2	-	3			1	-	3		
- Presence of contaminant from non local, non national sources (yes:1, no:0)	0					0					1				
- Potential mode of transportation of contaminant and extent of water movement	1	-	3			1	-	3			-	-	3		
- Groundwater	1	-	-			1	-	-			-	-	-		
- Air/rain fall	-	-	-			-	-	-			-	-	-		
- Water circulation	-	-	1			-	-	1			-	-	1		
- Quality of migratory species (Satisfied:0; stressful:1)	0					1					0				
Human Health	1	-	-	4	-	-	-	-	4	-	-	-	-	-	-
- Food safety (including bacteria contaminant) (satisfied:0; not satisfied:1)	1					0					0				
- Sickness/disease (cases/year)	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-
Future Threats	1	-	-	-	5	1	-	3	-	-	1	-	-	-	5
- Socio-economic and culture development (yes:1 no:0)	1					1					1				
- Population growth (next 5 and 10 years)	-	-	-	-	1	-	-	1	-	-		-	-	-	1
	8	16	21	16	10	8	4	15	4	20	6	2	6	4	5
TOTAL	**63**					**43**					**17**				

CRITERIA	Lingayen Gulf					Manila Bay					Total
	1	2	3	4	5	1	2	3	4	5	
Impact on the Marine Environment	4	-	3	-	10	7	6	12	-	20	486
- Ambient water quality	4	-	3	-	10	5	-	3	-	10	261
- Nutrient (Nitrate, Nitrite, Phosphate and Ammonia)	3	-	-	-	-	3	-	-		-	117
- Fecal Coli	-	-	-	-	-	-	-	-	-	-	21
- Heavy Metals (Cr,Cu,Pb,Cd,Zn,As,Hg), phenol	1	-	1	-	2	1	-	1	-	2	112
- DO	-	-	-	-	-	1	-	-	-	-	11
- Sediment Quality	-	-	-	-	-	2	2	6	-	5	80
- Cr	-	-	-	-	-	-	-	1	-	-	5
- Cu	-	-	-	-	-	-	1	-	-		11
- Pb	-	-	-	-	-	-	-	1	-	-	15
- Cd	-	-	-	-	-	-	-	-	-	1	25
- Zn	-	-	-	-	-	1	-		-	-	4
- DDT	-	-	-	-	-	-	-	-	-	-	5
- As	-	-	-	-	-	-	-	-	-	-	2
- Hg	-	-	-	-	-	1	-	-		-	13
- Biological samples	-	-	-	-	-	-	4	3	-	5	94
- Cr	-	-	-	-	-	-	-	-	-	-	10
- Cu	-	-	-	-	-	-	1	-	-	-	10
- Pb	-	-	-	-	-	-	-	1	-	-	24
- Cd	-	-	-	-	-	-	1	-	-	-	17
- Zn	-	-	-	-	-	-	-	-	-	1	19
- DDT	-	-	-	-	-	-	-	-	-	-	2
- As	-	-	-	-	-	-	-	-	-	-	4
- Hg	-	-	-	-	-	-	-	-	-	-	8
- Changes in living marine organisms	-	-	-	-		-	-	-	-		22
											22
- Affected marine community	-	-	-	-	-	-	-	-	-	-	29
- Mangrove	-	-	-	-	-	-	-	-	-	-	9
- Coral reef	-	-	-	-	-	-	-	-	-	-	6
- Wetland	-	-	-	-	-	-	-	-	-	-	5
- Seagrass	-	-	-	-	-	-	-	-	-	-	9
Regional and/or global significance	-	-	-	8	-	-	-	3	-	5	162
- Contaminant load	-					-					0
- Affected population		-	-	1	-		-	-	-	1	74
- Affected area (km2)		-	-	1	-		-	1	-	-	61
- Affected species	-	-	-	-	-	-	-	-	-	-	27
Transboundary Significance	-	-	3			1	-	3			156
- Presence of contaminant from non local, non national sources (yes:1, no:0)	0					1					0 0
- Potential mode of transportation of contaminant and extent of water movement	-	-	3			-	-	3			116 0 0
- Groundwater	-	-	-			-	-	-			0
- Air/rain fall	-	-	-			-	-	-			4
- Water circulation	-	-	1			-	-	1			36
- Quality of migratory species (Satisfied:0; stressful:1)	0					0					0
Human Health	-	-	-	-	-	1	-	-	-	-	48
- Food safety (including bacteria contaminant) (satisfied:0; not satisfied:1)	0					1					0
- Sickness/disease (cases/year)	-	-	-	-	-	-	-	-	-	-	48
Future Threats	-	-	-	-	5	1	-	3	-	-	59
- Socio-economic and culture development (yes:1 no:0)	0					1					0
- Population growth (next 5 and 10 years)		-	-	-	1		-	1	-	-	59
	4	-	6	8	15	10	6	21	-	25	
TOTAL	**29**					**52**					

Table 2 Ranking of Pollution Hot Spots and Major Problems at Each Hot Spot

	Name of Hotspots	Score	Major Problems
1	Pearl River	94	Nutrient Heavy Metals in Sediment Heavy Metals in Biological samples
2	Sihanoukville	74	Nutrient Heavy Metals in sea water Heavy Metals in Biological samples
3	Daya Bay	63	Heavy Metals in Biological samples Contaminant Movement Contaminant Load
4	The Upper Gulf of Thailand and East Coast	62	Nutrient Heavy Metals in Biological samples Contaminant Movement
5	Quang Ninh	60	Heavy Metals Heavy Metals in Sediment Heavy Metals & DDT in Biological samples
6	Batam	52	Heavy Metals in sea water Heavy Metals in Sediment Heavy Metals in Biological samples
6	Manila Bay	52	Heavy Metals in sea water Heavy Metals in Sediment Heavy Metals in Biological samples
8	Bei Hai	43	Heavy Metals in Sediment Contaminant Movement Contaminant Load
8	West Kalimantan	43	Nutrient Heavy Metals in sea water
10	Da Nang	37	Heavy Metals in sea water Contaminant Load Contaminant Movement
10	Koh Kong	37	Nutrient Heavy Metals in sea water Heavy Metals in Biological samples
12	DKI Jakarta	36	Nutrient Heavy Metals in sea water Contaminant Load
13	Vung Tau	35	Nutrient Heavy Metals in sea water Heavy Metals in Sediment
13	Kampot	35	Heavy Metals in sea water Heavy Metals in Sediment Heavy Metals in Biological samples
15	Lingayen	29	Heavy metals in sea water Contaminant Movement
16	Songkhla	23	Contaminant Load Contaminant Movement
17	Batangas	17	Contaminant Load Contaminant Movement

Table 3 Priority and rank of major problem at hot spots in the South China Sea marine basin

Problems	Total scores	Priority
1. Ambient water quality	261	**1**
- Nutrient (Nitrate, Nitrite, Phosphate and Ammonia)	117	**(i)**
- Fecal Coli	21	
- Heavy Metals (Cr,Cu,Pb,Cd,Zn,As,Hg), phenol	112	**(ii)**
- DO	11	
2. Sediment Quality	80	**3**
- Cr	5	
- Cu	11	
- Pb	15	
- Cd	25	**(iii)**
- Zn	4	
- DDT	5	
- As	2	
- Hg	13	
3. Biological samples	94	**2**
- Cr	10	
- Cu	10	
- Pb	24	
- Cd	17	
- Zn	19	
- DDT	2	
- As	4	
- Hg	8	
4. Changes in living marine organisms	22	**5**
	22	
5. Affected marine community	29	**4**
- Mangrove	9	
- Coral reef	6	
- Wetland	5	
- Seagrass	9	

ANNEX 6

Agreed Calendar of Deadlines for Tasks of the Regional Working Group for the Land-Based Pollution Component

Calendar	Agreed Deadlines for the activities
11 July 2003	Finalisation of the site characterisation
31 July 2003	Finalisation of the review of past and on-going projects
8 August 2003	Finalisation of review on national legislation
18-29 August 2003	Peer review of the national reports
12 September 2003	Final submission of meta-database
12 September 2003	Final submission of GIS database
12 September 2003	Finalisation of all national reports
5 November 2003	Submission of 1st draft of pilot activity proposals
14 November 2003	Submission of final version of the pilot activities proposals
12 – 15 January 2004	4th meeting of the Regional Working Group
11 – 13 February 2004	Regional Scientific Conference
14 – 16 February 2004	4th Meeting of the Regional Scientific and Technical Committee
25 – 27 February 2004	3rd meeting of the Project Steering Committee