

Contract No. HY/2013/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities –Infrastructure Works Stage I (Western Portion) InvestigationReport on Action Level or Limit Level Non-compliance

Report No.

004

Monitoring Date

03-Oct-16

The Action and Limit Levels of suspended solids (SS) determined from baseline monitoring data is reproduced

below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)	
Depth averaged SS (in mg/L)	23.5	34.4	

Mid-Flood tide

Monitoring Station	Monitoring time	Measured depth averaged	Level Exceeded
IS(Mf)11	07:55	25.7	Action
SR6	09:06	29.5	Action
SR7	07:48	24.3	Action

^{*}Monitoring was undertaken by the E.T. of Contract No. HY/2010/02

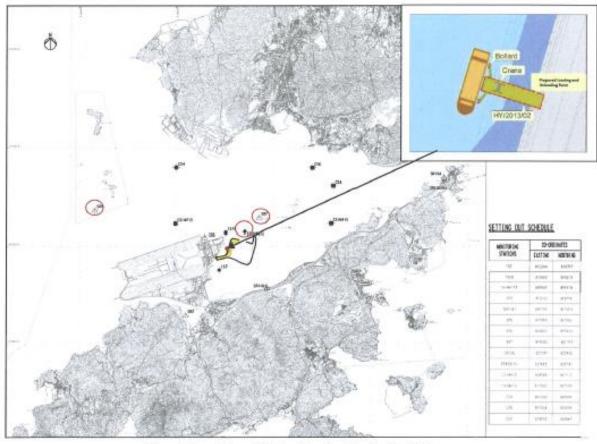


Figure 1 Location of Water Quality Monitoring Stations



Investigation Results:

a) Causes of exceedance

Exceedances were not due to operation of the works under Contract No. HY/2013/02 because:

- It was confirmed that there was no marine works or barge of this Contract worked at HKBCF reclamation site near the sea area or area near the monitoring stations IS(Mf)11, SR6 and SR7 from 27 September 2016 to the water quality monitoring period on 03 October 2016 under Contract No. HY/2013/02 so that it was unlikely to generate suspended solids in the marine water to cause the SS exceedances recorded at the monitoring station IS(Mf)11, SR6 and SR7 during mid-flood tide on 03 October 2016. Figure 1 showing the locations of the Water Quality Monitoring Stations where recorded exceedances and all relevant WQM stations.
- The exceedances were recorded during flood tide in which the direction of flow was flowing from east to west and the
 monitoring stations IS(Mf)11 and SR7 are located at upstream of the works area of this Contract and the
 monitoring station SR6 is located at downstream of the monitoring stations IS10 and SR5 which are
 located in between the works area of this Contract and the monitoring station SR6 but no SS exceedance
 were recorded at the monitoring station IS10 and SR5. Therefore, it is unlikely that the SS exceedances
 recorded at IS(Mf)11, SR6 and SR7 during mid-flood tide on 03 October 2016 were contributed by the
 works under Contract No. HY/2013/02.
- The water quality mitigation measures as mentioned in EM&A Manual and EP was fully implemented in this Contract which including maintenance of the silt curtain on a daily basis etc. The exceedances were considered as non-Project related.
- b) Action required under the action plan

- c) Action taken under the action plan
 - Not applicable as SS was not measured in situ;
 - After considered the above mentioned investigation results, it appears that it was unlikely that the SS exceedances were attributed to the above mentioned work site of this Contract;
 - 3. The exceedances were informed by IEC and ER;
 - 4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
- d) ET's conclusions and recommendations for mitigation
 - All relevant water quality mitigation measurement was checked to be fully implemented.
 - The Contractor was reminded to ensure all construction activities that generate wastewater with high concentrations of suspended solid (SS) should be collected to sedimentation tanks or package treatment systems for proper treatment prior to disposal.
 - The Contractor was reminded to ensure that all silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly.



- e) Contractor's actions to implement the mitigation
 - All construction activities that generate wastewater with high concentrations of suspended solid (SS) like wheel
 washing etc. was collected to sedimentation tanks or package treatment systems for proper treatment prior to
 disposal.
 - All silt removal facilities, channels and manholes was maintained and any deposited silt and grit was removed regularly.

ET Leader Signature & Date /

24-Oct-16



Contract No. HY/2013/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities –Infrastructure Works Stage I (Western Portion) Investigation Report on Action Level or Limit Level Non-compliance

Report No.

005

Monitoring Date

17-Oct-16

The Action and Limit Levels of suspended solids (SS) determined from baseline monitoring data is reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)
Depth averaged SS (in mg/L)	23.5	34.4

Mid-Flood tide

Monitoring Station	Monitoring time	Measured depth averaged	Level Exceeded
SR6	08:45	24.2	Action

^{*}Monitoring was undertaken by the E.T. of Contract No. HY/2010/02

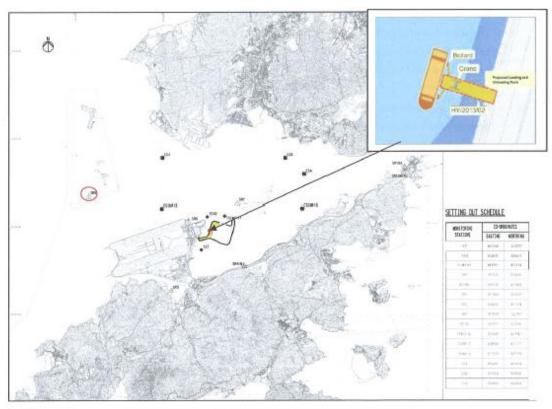


Figure 1 Location of Water Quality Monitoring Stations



Investigation Results:

- a) Causes of exceedance
 - Exceedance was not due to operation of the works under Contract No. HY/2013/02 because:
 - It was confirmed that there was no marine works or barge of this Contract worked at HKBCF reclamation site near the sea area or area near the monitoring station SR6 from 01 October 2016 to the water quality monitoring period on 17 October 2016 under Contract No. HY/2013/02 so that it was unlikely to generate suspended solids in the marine water to cause the SS exceedance recorded at the monitoring station SR6 during mid-flood tide on 17 October 2016. Figure 1 showing the location of the Water Quality Monitoring Station where recorded exceedance and all relevant WQM stations.
 - The exceedance was recorded during flood tide in which the direction of flow was flowing from east to west and the
 monitoring station SR6 is located at downstream of the monitoring stations IS10 and SR5 which are located
 in between the works area of this Contract and the monitoring station SR6 but no SS exceedance were
 recorded at the monitoring station IS10 and SR5. Therefore, it is unlikely that the SS exceedance
 recorded at SR6 during mid-flood tide on 17 October 2016 was contributed by the works under Contract
 No. HY/2013/02.
 - The water quality mitigation measures as mentioned in EM&A Manual and EP was fully implemented in this Contract which including maintenance of the silt curtain on a daily basis etc. The exceedance was considered as non-Project related.
- b) Action required under the action plan

- c) Action taken under the action plan
 - 1. Not applicable as SS was not measured in situ;
 - After considered the above mentioned investigation results, it appears that it was unlikely that the SS exceedance was attributed to the above mentioned work site of this Contract;
 - 3. The exceedance was informed by IEC and ER;
 - 4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
- d) ET's conclusions and recommendations for mitigation
 - All relevant water quality mitigation measurement was checked to be fully implemented.
 - The Contractor was reminded to ensure all construction activities that generate wastewater with high concentrations of suspended solid (SS) should be collected to sedimentation tanks or package treatment systems for proper treatment prior to disposal.
 - The Contractor was reminded to ensure that all silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly.
- e) Contractor's actions to implement the mitigation



- All construction activities that generate wastewater with high concentrations of suspended solid (SS) like wheel
 washing etc. was collected to sedimentation tanks or package treatment systems for proper treatment prior to
 disposal.
- All silt removal facilities, channels and manholes was maintained and any deposited silt and grit was removed regularly.

ET Leader Signature & Date

31-Oct-16



Contract No. HY/2013/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities –Infrastructure Works Stage I (Western Portion) Investigation Report on Action Level or Limit Level Non-compliance

Report No.

006

Monitoring Date

19-Oct-16

The Action and Limit Levels of suspended solids (SS) determined from baseline monitoring data is reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)
Depth averaged SS (in mg/L)	23.5	34.4

Mid-Flood tide

Monitoring Station	Monitoring time	Measured depth averaged	Level Exceeded
SR6	10:33	25.7	Action

^{*}Monitoring was undertaken by the E.T. of Contract No. HY/2010/02

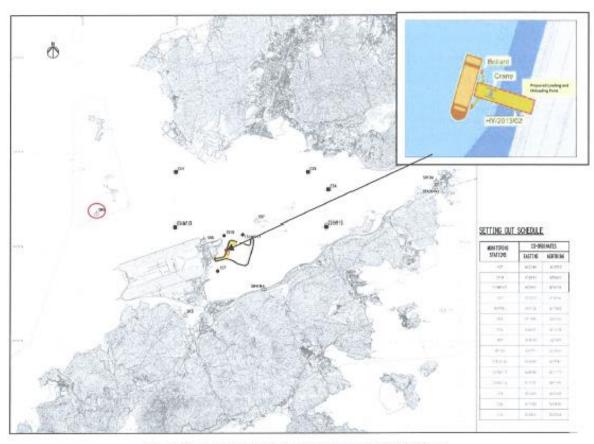


Figure 1 Location of Water Quality Monitoring Stations



Investigation Results:

Causes of exceedance

Exceedance was not due to operation of the works under Contract No. HY/2013/02 because:

- It was confirmed that there was no marine works or barge of this Contract worked at HKBCF reclamation site near the sea area or area near the monitoring station SR6 from 01 October 2016 to the water quality monitoring period on 19 October 2016 under Contract No. HY/2013/02 so that it was unlikely to generate suspended solids in the marine water to cause the SS exceedance recorded at the monitoring station SR6 during mid-flood tide on 19 October 2016. Figure 1 showing the location of the Water Quality Monitoring Station where recorded exceedance and all relevant WQM stations.
- The exceedance was recorded during flood tide in which the direction of flow was flowing from east to west and the
 monitoring station SR6 is located at downstream of the monitoring stations IS10 and SR5 which are located
 in between the works area of this Contract and the monitoring station SR6 but no SS exceedance were
 recorded at the monitoring station IS10 and SR5. Therefore, it is unlikely that the SS exceedance
 recorded at SR6 during mid-flood tide on 19 October 2016 was contributed by the works under Contract
 No. HY/2013/02.
- The water quality mitigation measures as mentioned in EM&A Manual and EP was fully implemented in this Contract which including maintenance of the silt curtain on a daily basis etc. The exceedance was considered as non-Project related.
- b) Action required under the action plan

- c) Action taken under the action plan
 - 1. Not applicable as SS was not measured in situ;
 - After considered the above mentioned investigation results, it appears that it was unlikely that the SS exceedance was attributed to the above mentioned work site of this Contract;
 - 3. The exceedance was informed by IEC and ER;
 - 4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
- d) ET's conclusions and recommendations for mitigation
 - All relevant water quality mitigation measurement was checked to be fully implemented.
 - The Contractor was reminded to ensure all construction activities that generate wastewater with high concentrations of suspended solid (SS) should be collected to sedimentation tanks or package treatment systems for proper treatment prior to disposal.
 - The Contractor was reminded to ensure that all silt removal facilities, channels and manholes shall be maintained
 and any deposited silt and grit shall be removed regularly.
- e) Contractor's actions to implement the mitigation



- All construction activities that generate wastewater with high concentrations of suspended solid (SS) like wheel
 washing etc. was collected to sedimentation tanks or package treatment systems for proper treatment prior to
 disposal.
- All silt removal facilities, channels and manholes was maintained and any deposited silt and grit was removed regularly.

ET Leader Signature & Date

31-Oct-16



Contract No. HY/2013/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities –Infrastructure Works Stage I (Western Portion) Investigation Report on Action Level or Limit Level Non-compliance

Report No.

007

Monitoring Date

14-Nov-16

The Action and Limit Levels of suspended solids (SS) determined from baseline monitoring data is reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)
Depth averaged SS (in mg/L)	23.5	34.4

Mid-Flood tide

Suspended Solids (SS) (in mg/L)

Monitoring Station	Monitoring time	Measured depth averaged	Level Exceeded
SR4(N)	17:26	25.6	Action

*Monitoring was undertaken by the E.T. of Contract No. HY/2010/02

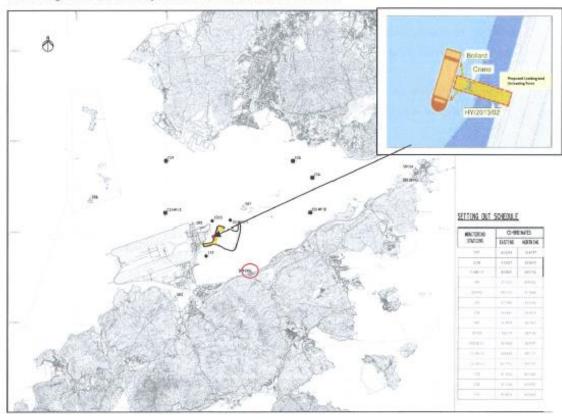


Figure 1 Location of Water Quality Monitoring Stations



Investigation Results:

a) Causes of exceedance

Exceedance was not due to operation of the works under Contract No. HY/2013/02 because:

- It was confirmed that there was no marine works or barge of this Contract worked at HKBCF reclamation site near the sea area or area near the monitoring station SR4(N) from 01 November 2016 to the water quality monitoring period on 14 November 2016 under Contract No. HY/2013/02 so that it was unlikely to generate suspended solids in the marine water to cause the SS exceedance recorded at the monitoring station SR4(N) during mid-flood tide on 14 November 2016. Figure 1 showing the location of the Water Quality Monitoring Station where recorded exceedance and all relevant WQM stations.
- The exceedance was recorded during flood tide in which the direction of flow was flowing from east to west and the
 monitoring station SR4(N) is located at upstream of the works area of this Contract. Therefore, it is unlikely
 that the SS exceedance recorded at SR4(N) during mid-flood tide on 14 November 2016 was contributed
 by the works under Contract No. HY/2013/02.
- The water quality mitigation measures as mentioned in EM&A Manual and EP was fully implemented in this Contract which including maintenance of the silt curtain on a daily basis etc. The exceedance was considered as non-Project related.
- b) Action required under the action plan

- c) Action taken under the action plan
 - 1. Not applicable as SS was not measured in situ;
 - After considered the above mentioned investigation results, it appears that it was unlikely that the SS exceedance was attributed to the above mentioned work site of this Contract;
 - 3. The exceedance was informed by IEC and ER;
 - 4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
- d) ET's conclusions and recommendations for mitigation
 - All relevant water quality mitigation measurement was checked to be fully implemented.
 - The Contractor was reminded to ensure all construction activities that generate wastewater with high concentrations of suspended solids (SS) should be collected to sedimentation tanks or package treatment systems for proper treatment prior to disposal.
 - The Contractor was reminded to ensure that all silt removal facilities, channels and manholes shall be maintained
 and any deposited silt and grit shall be removed regularly.
- e) Contractor's actions to implement the mitigation
 - All construction activities that generate wastewater with high concentrations of suspended solids (SS) like wheel
 washing etc. was collected to sedimentation tanks or package treatment systems for proper treatment prior to



 All silt removal facilities, channels and manholes was maintained and any deposited silt and grit was removed regularly.

ET Leader Signature & Date 25-Nov-16



Contract No. HY/2013/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities –Infrastructure Works Stage I (Western Portion) Investigation Report on Action Level or Limit Level Non-compliance

Report No.

800

Monitoring Date

16-Nov-16

The Action and Limit Levels of suspended solids (SS) determined from baseline monitoring data is reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)
Depth averaged SS (in mg/L)	23.5	34.4

Mid-Flood tide

Suspended Solids (SS) (in mg/L)

Monitoring Station	Monitoring time	Measured depth averaged	Level Exceeded
IS10	8:38	31.4	Action
SR5	8:51	28.8	Action
SR6	9:47	35.8	Limit

*Monitoring was undertaken by the E.T. of Contract No. HY/2010/02

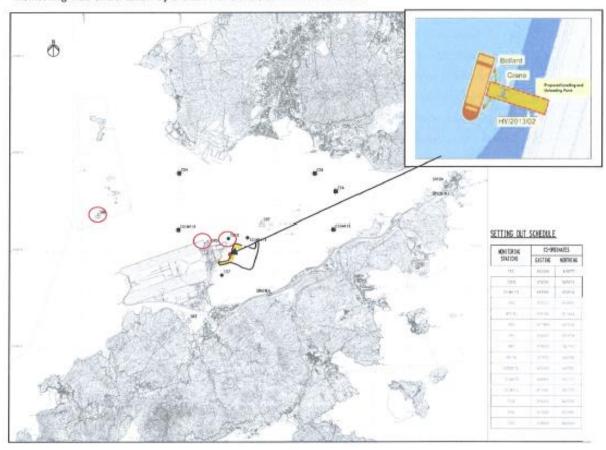


Figure 1 Location of Water Quality Monitoring Stations



Investigation Results:

a) Causes of exceedances

Exceedances were not due to operation of the works under Contract No. HY/2013/02 because:

- It was confirmed that there was no marine works or barge of this Contract worked at HKBCF reclamation site near the sea area or area near the monitoring stations IS10, SR5 and SR6 from 01 November 2016 to the water quality monitoring period on 16 November 2016 under Contract No. HY/2013/02 so that it was unlikely to generate suspended solids in the marine water to cause the SS exceedances recorded at the monitoring stations IS10, SR5 and SR6 during mid-flood tide on 16 November 2016. Figure 1 showing the location of the Water Quality Monitoring Stations where recorded exceedances and all relevant WQM stations.
- The water quality mitigation measures as mentioned in EM&A Manual and EP was fully implemented in this Contract
 which including maintenance of the silt curtain on a daily basis etc. The exceedances were considered as non-Project
 related.
- b) Action required under the action plan

Refer to Table 9.4 of the updated EM&A Manual for HKBCF.

- c) Action taken under the action plan
 - Not applicable as SS was not measured in situ;
 - After considered the above mentioned investigation results, it appears that it was unlikely that the SS exceedance was attributed to the above mentioned work site of this Contract;
 - 3. The exceedance was informed by IEC and ER;
 - 4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
 - Since it is considered that the SS exceedance is unlikely to be project related, actions 5-7 under the EAP are considered not applicable.
- d) ET's conclusions and recommendations for mitigation
 - All relevant water quality mitigation measurement was checked to be fully implemented.
 - The Contractor was reminded to ensure all construction activities that generate wastewater with high
 concentrations of suspended solids (SS) should be collected to sedimentation tanks or package treatment
 systems for proper treatment prior to disposal.
 - The Contractor was reminded to ensure that all silt removal facilities, channels and manholes shall be maintained
 and any deposited silt and grit shall be removed regularly.
- e) Contractor's actions to implement the mitigation
 - All construction activities that generate wastewater with high concentrations of suspended solids (SS) like wheel
 washing etc. was collected to sedimentation tanks or package treatment systems for proper treatment prior to
 disposal.
 - All silt removal facilities, channels and manholes was maintained and any deposited silt and grit was removed regularly.

ET Leader Signature & Date

12-Dec-16



Contract No. HY/2013/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities –Infrastructure Works Stage I (Western Portion) Investigation Report on Action Level or Limit Level Non-compliance

Report No.

009

Monitoring Date

18-Nov-16

The Action and Limit Levels of suspended solids (SS) determined from baseline monitoring data is reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)	
Depth averaged SS (in mg/L)	23.5	34.4	

Mid-Flood tide

Monitoring Station	Monitoring time	Measured depth averaged	Level Exceeded
IS(Mf)11	10:13	31.8	Action
IS10	10:25	28.8	Action
SR5	10:33	33.4	Action
SR6	11:22	25.1	Action
SR7	10:04	24.5	Action

^{*}Monitoring was undertaken by the E.T. of Contract No. HY/2010/02

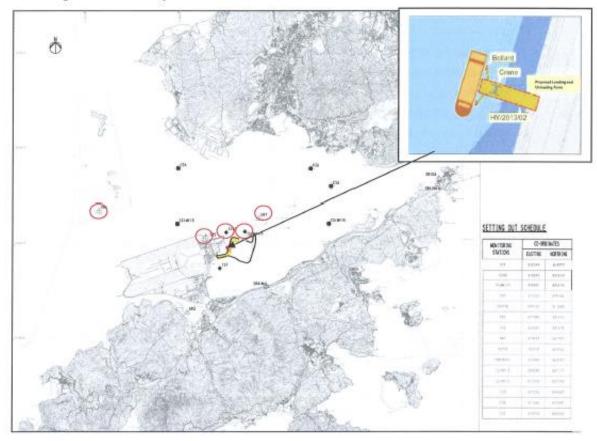


Figure 1 Location of Water Quality Monitoring Stations



Investigation Results:

a) Causes of exceedances

Exceedances were not due to operation of the works under Contract No. HY/2013/02 because:

- It was confirmed that there was no marine works or barge of this Contract worked at HKBCF reclamation site near the sea area or area near the monitoring stations IS(Mf)11, IS10, SR5, SR6 and SR7 from 01 November 2016 to the water quality monitoring period on 18 November 2016 under Contract No. HY/2013/02 so that it was unlikely to generate suspended solids in the marine water to cause the SS exceedances recorded at the monitoring stations IS(Mf)11, IS10, SR5, SR6 and SR7 during mid-flood tide on 18 November 2016. Figure 1 showing the location of the Water Quality Monitoring Stations where recorded exceedances and all relevant WQM stations.
- The water quality mitigation measures as mentioned in EM&A Manual and EP was fully implemented in this Contract
 which including maintenance of the silt curtain on a daily basis etc. The exceedances were considered as non-Project
 related.
- b) Action required under the action plan

Refer to Table 9.4 of the updated EM&A Manual for HKBCF.

- c) Action taken under the action plan
 - 1. Not applicable as SS was not measured in situ;
 - After considered the above mentioned investigation results, it appears that it was unlikely that the SS exceedance was attributed to the above mentioned work site of this Contract;
 - 3. The exceedance was informed by IEC and ER;
 - 4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
- d) ET's conclusions and recommendations for mitigation
 - All relevant water quality mitigation measurement was checked to be fully implemented.
 - The Contractor was reminded to ensure all construction activities that generate wastewater with high
 concentrations of suspended solids (SS) should be collected to sedimentation tanks or package treatment
 systems for proper treatment prior to disposal.
 - The Contractor was reminded to ensure that all silt removal facilities, channels and manholes shall be maintained
 and any deposited silt and grit shall be removed regularly.
- e) Contractor's actions to implement the mitigation
 - All construction activities that generate wastewater with high concentrations of suspended solids (SS) like wheel
 washing etc. was collected to sedimentation tanks or package treatment systems for proper treatment prior to
 disposal.
 - All silt removal facilities, channels and manholes was maintained and any deposited silt and grit was removed regularly.

ET Leader Signature & Date

12-Dec-16



Contract No. HY/2013/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities –Infrastructure Works Stage I (Western Portion) Investigation Report on Action Level or Limit Level Non-compliance

Report No. 010

Monitoring Date 30-Nov-16

The Action and Limit Levels of suspended solids (SS) determined from baseline monitoring data is reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)	
Depth averaged SS (in mg/L)	23.5	34.4	

Mid-Flood tide

Suspended Solids (SS) (in mg/L)

Monitoring Station	Monitoring time	Measured depth averaged	Level Exceeded
SR10A	07:16	25.9	Action
SR10B(N)	07:07	24.5	Action

*Monitoring was undertaken by the E.T. of Contract No. HY/2010/02

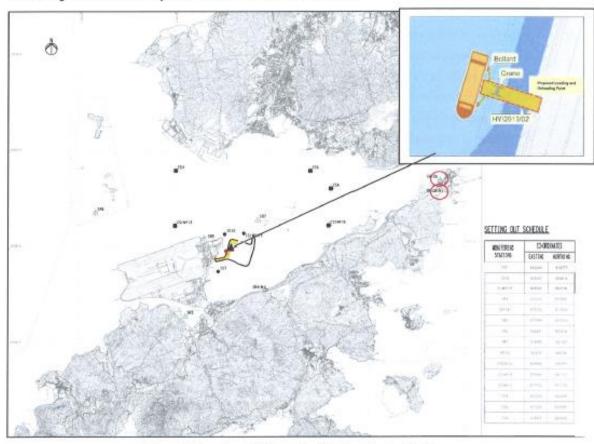


Figure 1 Location of Water Quality Monitoring Stations



Investigation Results:

Causes of exceedances

Exceedances were not due to operation of the works under Contract No. HY/2013/02 because:

- It was confirmed that there was no marine works or barge of this: Contract worked at HKBCF reclamation site near the sea area or area near the monitoring stations SR10A and SR10B(N) from 01 November 2016 to the water quality monitoring period on 30 November 2016 under Contract No. HY/2013/02 so that it was unlikely to generate suspended solids in the marine water to cause the SS exceedances recorded at the monitoring stations SR10A and SR10B(N) during mid-flood tide on 30 November 2016. Figure 1 showing the location of the Water Quality Monitoring Stations where recorded exceedances and all relevant WQM stations.
- The water quality mitigation measures as mentioned in EM&A Manual and EP was fully implemented in this Contract
 which including maintenance of the silt curtain on a daily basis etc. The exceedances were considered as non-Project
 related.
- Action required under the action plan

Refer to Table 9.4 of the updated EM&A Manual for HKBCF.

- Action taken under the action plan
 - 1. Not applicable as SS was not measured in situ;
 - After considered the above mentioned investigation results, it appears that it was unlikely that the SS exceedance was attributed to the above mentioned work site of this Contract;
 - 3. The exceedance was informed by IEC and ER;
 - 4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
- d) ET's conclusions and recommendations for mitigation
 - All relevant water quality mitigation measurement was checked to be fully implemented.
 - The Contractor was reminded to ensure all construction activities that generate wastewater with high
 concentrations of suspended solids (SS) should be collected to sedimentation tanks or package treatment
 systems for proper treatment prior to disposal.
 - The Contractor was reminded to ensure that all silt removal facilities, channels and manholes shall be maintained
 and any deposited silt and grit shall be removed regularly.
- e) Contractor's actions to implement the mitigation
 - All construction activities that generate wastewater with high concentrations of suspended solids (SS) like wheel
 washing etc. was collected to sedimentation tanks or package treatment systems for proper treatment prior to
 disposal.
 - All silt removal facilities, channels and manholes was maintained and any deposited silt and grit was removed regularly.

ET Leader Signature & Date

12-Dec-16