

APPENDIX 9D2

**Summary of Proposed
Simulations for Water
Quality Modelling for the
HKBCF, HKLR and
TMCLKL**

Scenario No.	Year	Description	Purpose	Model Output	Concurrent Projects Included
Simulations of Tidal Flows (Wet and Dry Season Simulations)					
V1	Verification (2010)	Simulation of the Baseline (2010) Scenario using the original model grid before any grid refinement	To verify that the grid refinement has not changed the simulation of the large scale tidal flows	The model results (tidal levels, water velocities and salinity at selected locations and discharges across selected sections) will be compared with the Baseline Simulation (No. 1 below) to verify that the grid refinement has not modified large scale tidal flows	see No 1. below
V2	Verification (2010)	Repeat the Baseline (2010) Scenario using the refined model grid for successive 15 days simulation period.	To verify that the spin up and simulation periods are sufficient and results stabilised	The model results (tidal levels, water velocities and salinity at selected locations and discharges across selected sections) will be compared with the Baseline Simulation (No. 1 below) to verify that the model has stabilised	see No 1. below
1	2010	Baseline Scenario using the refined model grid	Baseline Scenario before construction of the TM-CLKL+HKBCF+HKLR	The model results will be compared with the Verification simulations	Tonggu Channel changed bathymetry, CMPs 2010, Cooling water discharges from Black Point, Castle Peak and Lamna Power Stations
2	Feb 2011	Simulation of the coastline and extent of seawall construction in February 2011	To provide the tidal flows for the simulation of the initial worst case dredging and filling scenario	The model results will be compared with the Verification simulation and will provide tidal flow fields for the sediment plume simulations for the TM-CLKL+HKBCF+HKLR plus all concurrent projects expected to begin construction or be underway in 2011	Tonggu Channel changed bathymetry, CMPs 2011, Kwai Tsing Basin changed bathymetry, Cooling water discharges from Black Point, Castle Peak and Lamna Power Stations, part seawall for Portion A of HKBCF, HZMB artificial islands
3	Apr 2012	Intermediate construction phase on bulk completion of the HKBCF Phase I in April 2012	Tidal flow fields required for assessment of the construction impact of the intermediate phase of TM-CLKL+HKBCF+HKLR and all concurrent works in 2012.	Model results will provide tidal flow fields for the sediment plume simulations for the TM-CLKL+HKBCF+HKLR plus all concurrent projects expected to be under construction in this year at the time the Phase I works are finishing	Tonggu Channel changed bathymetry, CMPs at interim year, Kwai Tsing Basin changed bathymetry at 2012, Cooling water discharges from Black Point, Castle Peak and Lamna Power Stations, portion A, B and C and part phase II seawall for HKBCF, part TM-CLKL southern viaduct piers, seawall for southern rib and northern rib of northern and southern TM-CLKL reclamations respectively, Portion 1 and part of piers for HKLR, HZMB artificial islands, seawall for LLP 72ha.
4	Apr 2013	Simulation of the substantially completed TM-CLKL+HKBCF+HKLR and concurrent works in April 2013 when works are nearing completion but potential sediment losses are still significant	Tidal flow fields required for assessment of the construction impact of the nearly completed TM-CLKL+HKBCF+HKLR and all concurrent works in 2013.	Model results will provide tidal flow fields for the sediment plume simulations for the TM-CLKL+HKBCF+HKLR plus all concurrent projects expected to be under construction in this year at the time the Phase II works are finishing	Tonggu Channel changed bathymetry, CMPs at 2013, complete Kwai Tsing Basin changed bathymetry, Cooling water discharges from Black Point, Castle Peak and Lamna Power Stations, complete Phase I HKBCF, part complete Phase II reclamation and Portion D for HKBCF, complete northern reclamation for TM-CLKL, complete southern viaduct for TM-CLKL, complete reclamation for HKLR, part complete piers for HKLR, HZMB artificial islands, complete LLP 72ha
5	end 2026	Simulation of the completed TM-CLKL+HKBCF+HKLR and concurrent works including Road P1 in 2026	Tidal flow fields required for the assessment of the impact the completed TM-CLKL+HKBCF+HKLR compared to other concurrent works in completed 2026 has on tidal flows	Model results will provide the tidal flow fields required for the simulation of water quality on completion of the TM-CLKL+HKBCF+HKLR and all concurrent works in 2026	Tonggu Channel changed bathymetry, CMPs at 2016, complete Kwai Tsing Basin changed bathymetry, Cooling water discharges from Black Point, Castle Peak and Lamna Power Stations, complete HKBCF, complete TM-CLKL, complete HKLR, complete HZMB, LLP 72ha, LLP 40ha, Tung Chung East and West developments, Road P1 eastern section
6	end 2026	Simulation of the completed concurrent works including Road P1 but without the TM-CLKL+HKBCF+HKLR	Tidal flow fields required for the assessment of the impact the completed concurrent works in 2026 has on tidal flows without the TM-CLKL+HKBCF+HKLR.	Model results will provide the tidal flow fields required for the simulation of water quality on completion of all concurrent works in 2026 without the TM-CLKL+HKBCF+HKLR	Tonggu Channel changed bathymetry, CMPs at 2016, complete Kwai Tsing Basin changed bathymetry, Cooling water discharges from Black Point, Castle Peak and Lamna Power Stations, complete HZMB, LLP 72ha, LLP 40ha, Tung Chung East and West developments, Road P1 eastern section
Simulations of Sediment Plumes (Wet and Dry Season Simulations) - Construction Impacts					
Notes					
P1	2011	Simulation of the start of construction of the TM-CLKL+HKBCF+HKLR together with all concurrent projects underway or beginning in 2011	To assess cumulative impacts on suspended solids concentrations arising from losses of fine sediment to suspension during the construction of the TM-CLKL+HKBCF+HKLR and all other concurrent works in 2011	The model results (in terms of elevations in suspended solids concentrations and deposition rates) will be assessed with respect to the Water Quality Objectives and other water quality standards set for, for example, seawater intakes, marine life and deposition rates on coral sites. If the sediment to be dredged is contaminated, the model results will be interpreted in terms of the maximum contaminant concentrations in the water column and at the sensitive receivers.	These simulations will use the tidal flow model results from the Flow simulation No. 2 above and including sediment losses from concurrent projects listed above.
P2	2012	Simulation of the interim stages of construction of the TM-CLKL+HKBCF+HKLR Phase I together with all concurrent projects underway in 2012	To assess cumulative impacts on suspended solids concentrations arising from losses of fine sediment to suspension during the interim stages of construction of the TM-CLKL+HKBCF+HKLR Phase I and all other concurrent works in 2012	Same as P1	These simulations will use the tidal flow model results from the Flow simulation No. 3 above and including sediment losses from concurrent projects listed above.
P3	2013	Simulation of the interim stages of construction of the TM-CLKL+HKBCF+HKLR Phase II together with all concurrent projects underway in 2013	To assess cumulative impacts on suspended solids concentrations arising from losses of fine sediment to suspension during the interim stages of construction of the TM-CLKL+HKBCF+HKLR Phase II and all other concurrent works in 2013	Same as P1	These simulations will use the tidal flow model results from the Flow simulation No. 4 above and including sediment losses from concurrent projects listed above.
P4	2011	Simulation of the start of construction of the TM-CLKL+HKBCF+HKLR in 2011	To assess impacts on suspended solids concentrations arising from losses of fine sediment to suspension during the construction of the TM-CLKL+HKBCF+HKLR in 2011	Same as P1	Similar to Simulation P1, but the sediment losses from concurrent projects excluded.
P5	2012	Simulation of the interim stages of construction of the TM-CLKL+HKBCF+HKLR Phase I	To assess impacts on suspended solids concentrations arising from losses of fine sediment to suspension during the interim stages of construction of the TM-CLKL+HKBCF+HKLR Phase I in 2012	Same as P1	Similar to Simulation P2, but the sediment losses from concurrent projects excluded.
P6	2013	Simulation of the interim stages of construction of the TM-CLKL+HKBCF+HKLR Phase II	To assess impacts on suspended solids concentrations arising from losses of fine sediment to suspension during the interim stages of construction of the TM-CLKL+HKBCF+HKLR Phase II in 2013	Same as P1	Similar to Simulation P3, but the sediment losses from concurrent projects excluded.
P7	2011	Simulation of the start of construction of the TM-CLKL+HKBCF+HKLR in 2011	Similar to P4, but with specific mitigation measures applied to lower the sediment losses.	Same as P1	Similar to Simulation P4, but the sediment losses from the project mitigated.
P8	2012	Simulation of the interim stages of construction of the TM-CLKL+HKBCF+HKLR Phase I	Similar to P5, but with specific mitigation measures applied to lower the sediment losses.	Same as P1	Similar to Simulation P5, but the sediment losses from the project mitigated.
P9	2013	Simulation of the interim stages of construction of the TM-CLKL+HKBCF+HKLR Phase II	Similar to P6, but with specific mitigation measures applied to lower the sediment losses.	Same as P1	Similar to Simulation P6, but the sediment losses from the project mitigated.
Simulations of Marine Water Quality (Annual Simulations) - Operational Impacts					
WQ1	2026	Simulation of the completed TM-CLKL+HKBCF+HKLR and all other concurrent projects in 2026	This simulation is required to determine future water quality patterns following completion of the TM-CLKL+HKBCF+HKLR and all expected concurrent works	The results from this simulation will be compared with the relevant Water Quality Objectives and other water quality standards which might apply. The results will also be compared with those from WQ2 below in order to assess the potential impacts from the completed TM-CLKL+HKBCF+HKLR on marine water quality.	
WQ2	2026	Simulation of the completed concurrent projects in 2026 but without the TM-CLKL+HKBCF+HKLR	This simulation is required to determine future water quality patterns assuming the TM-CLKL+HKBCF+HKLR is not constructed	The results from this simulation will be compared with the relevant Water Quality Objectives and other water quality standards which might apply. The results will also be compared with those from WQ1 above in order to assess the potential impacts from the completed TM-CLKL+HKBCF+HKLR on marine water quality.	