

Deltaport Third Berth Project Adaptive Management Strategy – 2009 Annual Report

What is the Adaptive Management Strategy?

The Adaptive Management Strategy (AMS) is one of several significant environmental programs being undertaken as part of the Deltaport Third Berth Project (DP3). It is a science-based approach to monitoring and managing the Roberts Bank ecosystem. The approach will allow for the early detection of changes in the inter-causeway ecosystem so that potential significant negative ecosystem trends that are attributable to the DP3 Project can be prevented or mitigated. The AMS was developed in conjunction with and approved by Environment Canada.

What is the Adaptive Management Strategy - 2009 Annual Report?

The AMS 2009 Annual Report provides interpretation and discussion of the data that was collected in 2009, the third year of the AMS program. The results of the first two years of the AMS program were presented in the 2007 and 2008 Annual Reports, which are available on the Port Metro Vancouver website as

follows: http://portmetrovancover.com/projects/ongoing_projects/Deltaport_Third_Berth_Project/Environment.aspx. The 2009 Annual Report also evaluates potential trends occurring in the inter-causeway area and includes recommendations for modification of the AMS work program to better investigate identified trends or to reduce the scope of work when no impacts are evident.

Environmental monitoring for the DP3 AMS program is conducted in the following areas:

1. Coastal geomorphology
2. Surface water quality
3. Sediment quality
4. Eelgrass
5. Other biota, including benthic community and bird populations

The AMS 2009 Annual Report was prepared by a multi-discipline environmental science and engineering team consisting of Hemmera, Northwest Hydraulic Consultants and Precision Identification Biological Consultants and was reviewed by the Scientific Advisory Committee (SAC). The SAC is a panel of independent scientists who review the scientific data and interpretations of those data submitted by Port Metro Vancouver, to develop an opinion as to whether a negative ecosystem trend is emerging in the inter-causeway area as a result of DP3, or if a threshold for any mitigation action has been exceeded.

Overview

Based on the results of the first three years of monitoring for the DP3 AMS program, to date, it does not appear that the DP3 construction activities have contributed to significant negative ecosystem trends in the inter-causeway area. Significant findings from each of the AMS monitoring components are summarized in the following sections.

Coastal Geomorphology

The results of the third year of coastal geomorphology monitoring continue to suggest that the magnitude of change on the tidal flats is not large and the turbidity levels are generally very low. The most dynamic areas within the inter-causeway area were related to pre-existing processes, and were not related to DP3 construction activities. The exception to this was the formation of new drainage channels adjacent to the perimeter dikes in 2007. By the end of 2007, it appeared that these channels were stabilizing, and the 2008 AMS program provided further evidence of this. The data collected and observations made during the 2009 coastal geomorphology program continue to support the finding that the channels have stabilized. This area will continue to be monitored during the 2010 AMS program.

The current monitoring program completed in 2009 confirmed the model predictions from the DP3 Environmental Assessment that the construction and operation of Deltaport Third Berth would not have a significant or adverse effect on tidal currents. Tidal currents at the northeast tip of the DP3 terminal did not increase appreciably and have remained low.

Surface Water Quality

Overall, metal and nutrient concentrations in surface water were in the same range during the 2009 surface water quality monitoring program as measured during the 2007 and 2008 programs. As was noted in 2008, the highest metals concentrations were measured at the reference stations. Total chromium, copper and zinc concentrations were sporadically found to exceed the BC Water Quality Guidelines in surface water during the 2009 program at both inter-causeway and reference station sampling locations. Boron and iron exceedances in surface water are typical of local marine surface waters and have been noted consistently during each quarter, and across the three years of the surface water monitoring program.

Nutrient concentrations in surface water samples were similar at the inter-causeway stations to those measured at the reference stations. The highest nutrient concentrations were measured in samples collected at a station that is located at the outflow of an agricultural ditch, which is not representative of water quality within the inter-causeway. These higher concentrations are likely the result of upland inputs, and are not considered to be attributable to the DP3 construction activities. The data collected to date do not suggest a trend towards eutrophication in the inter-causeway area.

Sediment Quality

The 2009 AMS program for monitoring sediment quality did not identify any metals parameters in exceedance of the BC Contaminated Sites Regulation sediment quality guidelines, and there was no evidence of metals impacts from the DP3 project. Concentrations of eutrophication related parameters in sediments were generally higher in the inter-causeway area than at the reference stations; however, there is no evidence, at this time, of a trend towards eutrophication within the inter-causeway area. Surface water and sediment quality monitoring will continue throughout the 2010 AMS program.

Eelgrass

The 2009 eelgrass program indicated that eelgrass distribution in the area adjacent to the DP3 footprint has expanded over the last year. Eelgrass was healthy and productive at all stations except one. At that one location, eelgrass habitat had converted from "continuous"

eelgrass to “patchy” eelgrass. It appears that this change is related to the evolution of the sand lobe associated with the dendritic channels that developed in the 1980s within the inter-causeway area.

Based on the results of the 2009 monitoring, the eelgrass at most sites in the inter-causeway area appear to be flourishing. A Seabed Imaging Mapping System survey was conducted in 2009, and it determined that the lower limit of eelgrass distribution in the inter-causeway was very similar to that mapped using this method in 2003. In addition, the assessment of epiphyte load and the absence of *Beggiatoa* sp. indicated that the eelgrass habitat was in good condition and showing no signs of eutrophication. Based on the above, it does not appear that the development of DP3 has negatively affected the inter-causeway eelgrass habitat.

Benthic Community

Overall, the results of the benthic community sampling conducted during the 2009 AMS monitoring program indicated that the benthic invertebrate populations in both the inter-causeway area and the reference area are diverse, healthy and well established. The data did not suggest a trend towards eutrophication or direct DP3 construction or operation impacts.

Bird Populations

The coastal seabird/shorebird composition, relative abundance, and use of the inter-causeway area were very similar in 2009 to that documented during 2008. The third year of the AMS bird monitoring program found consistent seasonal patterns and expected natural variability in the abundance and distribution of birds in the inter-causeway area. Starting in 2010, the bird surveys will concentrate on focal species, including great blue heron and brant geese.

Additional Information

Detailed information on the AMS program, the findings of the 2009 field program, and the recommendations for changes to the AMS program for 2010 are contained in the 2009 Annual Report, which can be accessed through the Port Metro Vancouver website at www.portmetrovancover.com.

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