

## **Environmental Monitoring Summary of Marine Trenching for the Telus Duct Bank Installation at the Johnson Street Bridge Replacement Project, Victoria, BC, December 2011 & January, 2012**

Castor Consultants Ltd. (Castor) was retained by Ruskin Construction Ltd. (Ruskin) to conduct routine environmental monitoring of the marine trenching aspects of the Telus Duct Bank Installation at the Johnson Street Bridge Replacement project in Victoria Harbour. Monitoring was conducted in accordance with advice provided by Transport Canada (TC) and Fisheries and Oceans Canada (DFO) and was predicated on an Environmental Management Plan prepared by Castor on behalf of Ruskin dated December 7, 2011.

### **1/ Removal of six timber piles associated with a timber wharf on the west shore of Victoria Harbour, December 22, 2011**

Castor monitored the pulling of six timber piles using a barge mounted crane between 07:30 and 08:30 hrs on December 22, 2011. No finfish were present on the marine foreshore during the work and the piles were placed on the adjacent dock where they were cut into pieces suitable for appropriate disposal. Sedimentation was minimal (clay substrate) and confined to the immediate area at the wharf. Pile Driving Guidelines established jointly by Industry and DFO were adhered to during the process. A brief monitoring report on this phase of the project was submitted to Ruskin on December 23, 2011.

### **2/ Monitoring of Marine Trenching for Telus Cable Installation Across Victoria Harbour, January 5 – 7 & 9, 2012**

Castor monitored marine cable trenching by Ruskin continuously during the four days of marine sediment excavation beginning January 5, 2012 at 10:30 hr. A barge-mounted Hitachi long reach excavator equipped with a Trimble GPS performed the work. All excavated sediments were loaded onto an adjacent scow for appropriate disposal off-site. Periodic turbidity measurements were taken throughout the excavation process, using a LaMotte 2020e turbidity meter with laboratory-prepared standard NTU vials.

Turbidity measurements indicated that background in the harbour ranged from a low of 0.52 NTU to a high of 1.76 NTU. The former reading was taken on a sunny day after several mostly cloudy days with minor showers while the latter reading was taken on the first day of monitoring observations during a period of steady rain. As expected, turbidity was highest near (within 10 m) the working rig (ranging up to 11.3 NTU – background was between 1.22 and 1.62 on this day, January 7<sup>th</sup>), but generally fell to background levels at 50 m or less down current (with some exceptions). During a falling tide, turbidity measurements fell rapidly only a short distance from the rig.

Neither Castor nor divers working on the project observed any live finfish during the trenching, however, cormorants and seals were sighted adjacent to the work area from time to time. Only one live cockle (*Clinocardium nuttallii*) and one marine polychaete were noted during close

examination of the excavated sediments. However, gulls and crows were noted picking through the pilings used to secure hay bale filtration at either end of the scow, removing mussels and barnacles and scavenging in some of the sediments on the barge.

Based on the biological observations, very few finfish were likely present during the construction work and the harbour sediments generally supported very few animals due to their contaminated nature. Disturbed marine sediments were generally fairly compacted with little dispersal of sediment plumes shortly after excavation. Downstream effects of sedimentation were likely minimal, as background turbidity in the harbour tended to be high, especially during rain events. Monitoring showed that the mitigation applied was effective.

### **3/ Monitoring Gravel Placement in the Prepared Marine Trench – January 16, 2012**

Biological monitoring by Castor occurred during initial gravel placement on the morning of January 16, 2012 between 10:00 and 11:00 hr. A Trimble GPS-equipped Hitachi long reach excavator, working from the Ruskin spud barge placed clean, graded gravel over the cable bundle in the marine trench. Gravel was piled within reach of the Hitachi on an adjacent scow using a second excavator. Turbidity measurements were taken from a sidewinder boat, at various locations and distances from the construction activity using a LaMotte 2020e turbidity meter with laboratory-prepared standard NTU vials.

Turbidity measurements indicated that background in the harbour on January 16, 2012 ranged from 0.62 – 0.66 NTU. Maximum turbidity readings taken within the construction plume were recorded at 21.7 NTU, however, this level dropped to 4.67 at a distance of 14 m down current. Background readings were attained 122 m down current or south of the rig (0.62 NTU), 41 m east of the rig (0.66 NTU) and 76 m up current or north of the rig (0.64 NTU). As expected, turbidity was high near the working rig, but declined rapidly a few meters away.

No finfish were observed while on-site and seabird activity was minimal.

### **4/ Monitoring of General Site Conditions – January 16, 2012**

A visual inspection of the overall construction site and the associated soil piles was made by Castor between 09:30 and 10:30 hr on January 16, 2012.

A silt fence on the east side of the harbour near the trench excavation at tidewater required minor maintenance and Ruskin was informed of this item. A trench material spoil pile located on an asphalt surface away from tidewater had the potential to leach material during heavy rains and Ruskin was informed of this possible maintenance issue with a request to cover the pile with plastic sheeting unless the material was removed in due course.

No finfish were observed while on-site and seabird activity was minimal.

## **5/ Monitoring Diver-Operated Trench Jetting in the Prepared Trench – January 20, 2012**

Biological monitoring by Castor occurred during diver operated jetting work within the marine trench (preparing the trench to final engineering specifications) on January 20, 2012 between 10:30 and 11:00 hr and again between 13:30 and 15:00 hr. Turbidity measurements were taken from a sidewinder boat, at various locations and distances from the construction activity using a LaMotte 2020e turbidity meter with laboratory-prepared standard NTU vials.

Maximum turbidity measured was recorded both at the trench location (5.36 NTU) and 227 m North of the trench near another industrial site (5.38 NTU) during a period when trench jetting had ceased for a period of more than 2 hr. Background levels of turbidity were very high during this monitoring day due to a rainfall event, with the lowest levels recorded occurring 25 m away from active jetting at 1.83 NTU at 10:30 hr.

No finfish were observed while on-site and seabird activity was minimal.

### **Conclusions**

Based on the results of the biological monitoring conducted by Castor in December and January, 2012, the Environmental Management Plan prepared by Castor on behalf of Ruskin (December 7, 2011) has been strictly adhered to. More specifically, equipment has been maintained in a clean and serviceable condition, wastes and runoff have been collected and contained for appropriate offsite disposal and regular testing for total suspended solids has been carried out in a responsible manner as required. Substrate, broken timber piles and refuse removed from the marine environment during trenching has been collected on a scow for appropriate disposal offsite.

Removal of timber piles from the existing wharf on the west side of the trenching project site was conducted according to the established Pile Driving Best Management Practices.

The entire marine trenching procedure was monitored according to prescribed methods set out in the Transport Canada Environmental Screening Report dated February 16, 2011 and the DFO Habitat Authorization dated January 4, 2012. Detailed reports were submitted by Castor to Ruskin following each instance of environmental monitoring for the project. All construction activities taking place in waters frequented by fish (pile removal, trenching, gravel placement, jetting by divers, cable duct installation and placement of concrete mats) occurred during the work windows stipulated by the responsible authorities.

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